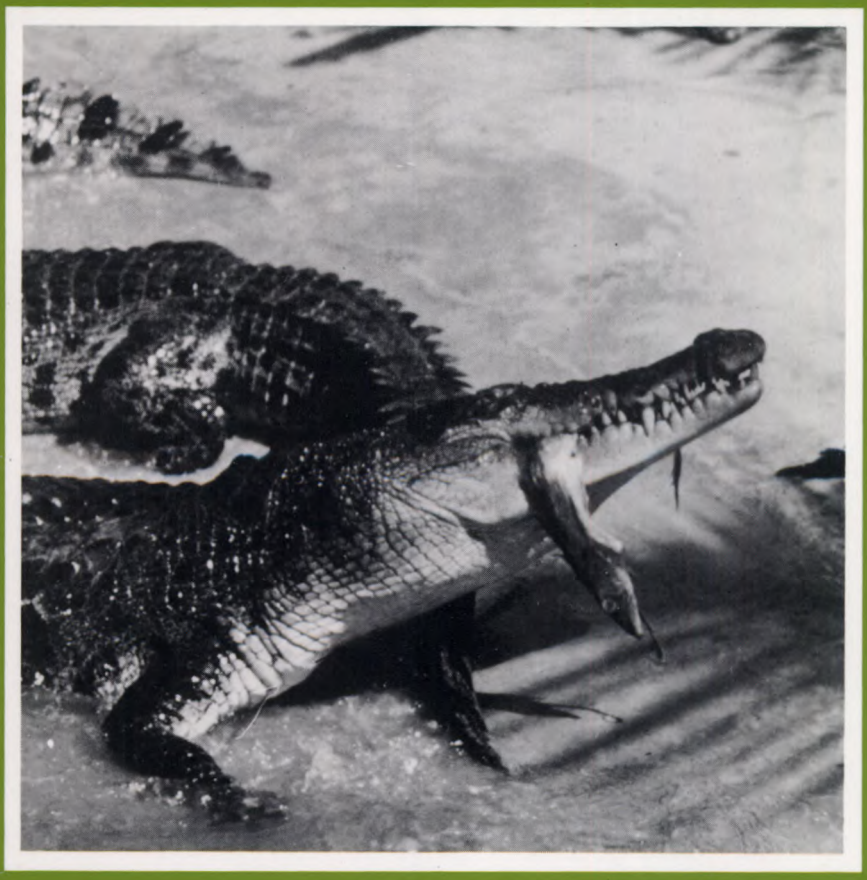
# Directory of Crocodilian Farming Operations

## Second Edition

World Conservation Monitoring Centre



IUCN – The World Conservation Union

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The World Conservation Monitoring Centre (WCMC) is a joint venture between the three partners who developed the *World Conservation Strategy* and its successor, *Caring for the Earth*: IUCN – The World Conservation Union, UNEP – United Nations Environment Programme, and WWF – World Wide Fund For Nature (formerly World Wildlife Fund). Its mission is to support conservation and sustainable development through the provision of information on the world's biological diversity.

WCMC has developed a global overview database that includes threatened plant and animal species, habitats of conservation concern, critical sites, protected areas of the world, and the utilization and trade in wildlife species and products. Drawing on this database, WCMC provides an information service to the conservation and development communities, governments and the United Nations agencies, scientific institutions, the business and commercial sector and the media. WCMC produces a wide variety of specialist outputs and reports based on analyses of its data.

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GEMS – Global Environment Monitoring System, coordinated by UNEP, is a collective programme of the world community to acquire, through global monitoring and assessment, the data that are needed for rational management of the environment. Monitoring activities fall into five major programmes: climate-related monitoring, long range transport of air pollutants, health-related monitoring, oceans and terrestrial renewable resources. WCMC contributes its biodiversity data to GEMS.

# DIRECTORY OF CROCODILIAN FARMING OPERATIONS

## Second Edition


Edited by

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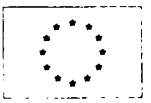

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# PREFACE TO THE SECOND EDITION

The first *Directory of Crocodilian Farming Operations*, published in 1985, attempted to list all commercial farms. It was primarily intended as a conservation tool to assist government agencies in identifying legal sources of crocodilian skins and wildlife managers in developing farming projects to benefit the conservation of the wild resource. Associated with the latter category were individual entrepreneurs who wished to establish crocodilian farms and were seeking contacts who might be able to supply livestock or expertise. As the following pages show, the farming of crocodilians has increased substantially during the intervening seven years and so the information in the first edition is now out of date. The need for information on existing farms has increased and has therefore necessitated the production of this revised edition.

Unlike conventional agriculture, there is very little technical literature on crocodilian farming, and members of the IUCN/SSC Crocodile Specialist Group were continually being asked for advice of a technical nature about the establishment and operation of crocodilian farms. In response to this demand, the first section of this book provides a brief technical introduction designed to alert prospective farmers to the factors which should be taken into account before embarking on such a venture.

***It must be stressed that the inclusion of a farm in this directory does not in any way imply endorsement by IUCN or the CITES Secretariat. While care has been taken in compiling the information and attempts have been made, where possible, to verify it independently, it is inevitably incomplete and, as it derives from a number of different sources, its accuracy cannot be guaranteed. The only formal mechanism for approval of crocodilian farms is the register maintained by the CITES Secretariat of operations breeding Appendix I species in captivity for commercial purposes. The inclusion of farms in the register is, in all cases, noted in this directory.***

# PART 1

## AN INTRODUCTION TO THE FARMING OF CROCODILIANS

Edited by

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From a workshop held at the
10th Working Meeting of the IUCN/SSC
Crocodile Specialist Group (CSG)
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## Preface

The Steering Committee and members of the IUCN/SSC Crocodile Specialist Group (CSG) receive an inordinate number of inquiries about crocodile utilization and farming each year. Although we attempt to answer all letters, many are of a general nature - "I am starting a crocodile farm. Please send me all the relevant literature, management details and farm plans." They have often been written by people who have never set eyes on a live crocodilian, nor heard of CITES. Yet they are clearly from people interested in the "business" of crocodiles, and there are many examples where such cursory interest has ultimately led to significant conservation gains. The late Graham Goudie's exploits in Papua New Guinea are a good example.

A comprehensive crocodilian farming handbook is one approach that the CSG Steering Committee considered. However, the task of compilation would be daunting and the final price would restrict its utility for general inquiries. This booklet, then, is our solution to the problem. It provides a comprehensive but brief and easily readable background for prospective crocodilian farmers - and it is not expensive. We feel it answers most of the commonly asked questions. It is directed at a general audience rather than at established crocodilian farmers, although we hope that they might find it interesting and perhaps learn a thing or two in its reading.

From the outset, it must be recognized that research on intensive production of crocodilians has been "patchy". Egg management, for example, has a strong research background and advice can be given with confidence. Captive breeding and the immediate post-hatching treatment of hatchlings are less well understood, and may be subject to significant differences between species. Much more research is needed before crocodilian farming will become a highly efficient system of animal production *per se*. Nevertheless, some farms which follow a few simple guidelines are model business operations which generate significant profits.

Finally, in compiling this booklet we have kept jargon and scientific terminology to a minimum, and have not cluttered the text with references. Given that some terms are still likely to be new and unfamiliar to the general reader, a glossary has been included.

**Contributors and acknowledgements**

Many people have contributed directly and indirectly to this booklet, and we would particularly like to thank the following crocodilian specialists and farmers, who attended the CSG workshop and/or provided written contributions, comments, suggestions and editorial assistance: Don Ashley, Roland Coulson, Dennis David, Ruth Elsey, Mark Ferguson, Chris Foggin, Ian Games, Rene Haller, Martin Hollands, Hank Jenkins, Ted Joanen, John Loveridge, Richard Luxmoore, Wayne King, Charlie Manolis, Steele McAndrew, Larry McNease, Harry Messel, Greg Mitchell, Vic Onions, Tony Pooley, Miguel Rodriques, Perran Ross, Mark Staton, Jim Stuart, Kevin van Jaarsveldt, Brian Vernon, Allen "Woody" Woodward, and Ariel Zilber.

The final version owes much to these people, although any remaining "howlers" in the final text are entirely the responsibility of the editors. Particular thanks are due to the people who went to great lengths to produce manuscripts, many of which were outstanding but which were eventually deemed to be largely outside the scope of this work. Some of these contributions have been included in a greatly reduced and rewritten form; others have subsequently been published elsewhere.

Financial support for the preparation of the report has been provided largely by J.M. Hutton (Pvt) Ltd, G. Webb Pty Ltd, the Crocodile Farmers Association of Zimbabwe and the Conservation Commission of the Northern Territory.

# 1. Regulations

The term *crocodilians* is used to refer to the 23 different species of crocodile-like animals around the world: alligators and caimans (8 species), true crocodiles (13 species), and gharials and false gharials (2 species). Within most countries, crocodilians cannot just be kept and traded like domestic animals and pets. They are "wildlife", and there will usually be laws restricting what private individuals can do with them. For example, wild crocodiles may be totally protected, or they may be managed through a system requiring licences and permits for catching, keeping, selling, trading, killing, etc. As these laws vary from country to country, and enforcement of them ranges from strict to lax, we make no attempt to summarize them here. However, they are of critical importance to anyone considering crocodilian farming.

At the international level, trade in crocodilians and products derived from them is controlled through CITES - the Convention on International Trade in Endangered Species of Wild Fauna and Flora. The mechanisms by which CITES exerts control are more complex with crocodilians than with any other group of living organisms. There are two basic levels of control. Most crocodilian species are listed in *Appendix I* of CITES, for which no commercial trade between nations is allowed, unless the animals being traded have been bred in captivity. The remainder are in *Appendix II*, for which trade is permitted if export permits are issued by the relevant authority. Since the inception of CITES in 1975, all species of crocodilians have been listed on Appendices I or II.

Since 1975, a number of local populations have been transferred from Appendix I to Appendix II, for a variety of reasons, and using a variety of mechanisms. Consequently, there are now at least five different levels of control accorded to crocodilians under CITES:

## 1.1. Appendix I

Appendix I contains "all species threatened with extinction which are or may be affected by trade. Trade in specimens of these species ... must only be authorized in exceptional circumstances" (CITES, Article II, para. 1). The export of wild animals to be used as breeding stock for establishing farms or zoos is not permitted, unless the aim is to instigate a breeding programme intended to ensure the survival of the species. Hunting trophies intended for personal use (not resale) may be exported, although some nations (e.g. the USA) prohibit their importation unless a specific exemption is provided in their domestic import regulations.

## 1.2. Appendix I (Bred in captivity for commercial purposes)

Appendix I animals are controlled as though they were Appendix II animals if they are "bred in captivity for commercial purposes". This has been defined as: "born or otherwise produced in a controlled environment, ... of parents that mated ... in a controlled environment". For crocodilians, this means that the offspring must hatch from eggs laid in a farm, and that the breeding stock must be "established in a manner not detrimental to the survival of the species in the wild" and must be "maintained without augmentation from the wild, except for the occasional addition of animals ... from wild populations to prevent deleterious inbreeding". Resolution Conf. 8.22 forbids the removal of breeding stock from

a depleted wild population unless it "is justified in a national management plan demonstrating conservation value". The breeding stock must also be managed in a manner designed to maintain it indefinitely, and that "has been demonstrated to be capable of reliably producing second-generation offspring" (Resolution Conf. 2.12). This does not mean that the farm cannot trade until it has achieved second-generation breeding, but rather that it must be using suitable and reliable husbandry techniques. Farms must also be registered with the CITES Secretariat (via the local Management Authority) and approval may be withdrawn if they fail to comply with the required conditions.

### 1.3. Appendix II (transferred from Appendix I for ranching)

Under CITES Resolution Conf. 3.15, Appendix I animals "which are deemed by the Parties to be no longer endangered and to benefit by ranching" may be transferred to Appendix II, if strict management criteria are adhered to. Ranching is defined as "the rearing in a controlled environment of specimens taken from the wild". The operation must be "primarily beneficial to the conservation of the local population (i.e. where applicable contribute to its increase in the wild)". In order for a country to transfer a population from Appendix I to Appendix II for ranching, it should have carried out research on the wild population and be able to ensure "that the taking from the wild shall have no significant detrimental impact on wild populations". With crocodilians, the harvesting of eggs and hatchlings (for ranching) appears to have a minimal impact on the wild populations relative to the harvesting of adults. Resolution Conf. 8.22 recognized that the removal of eggs and hatchlings carries less threat to the wild population than the harvesting of adults, and it recommended that proposed ranching operations based on such offtake should be "accepted as a matter of routine", provided that sufficient safeguards are established in the proposal.

### 1.4. Appendix II (an interim transfer from Appendix I on the basis of a quota)

CITES Resolution Conf. 5.21, now replaced by 7.14, was adopted as an interim measure in 1985 to allow limited quotas of skins of Appendix I animals to be exported, pending transfer of the population to Appendix II by other means (e.g. for ranching). Quotas are set by international agreement and must be based on surveys predicting the likely impact of the harvest. Quotas may be set separately for the export of wild-caught and ranch-reared animals or their skins. The system is intended to operate for a maximum of four years, after which a country is expected to have accumulated sufficient information to show either that the population has recovered and merits retention on Appendix II, or that a ranching scheme can operate.

### 1.5. Appendix II

Populations on Appendix II, or which have been transferred back to Appendix II after having recovered, may be traded internationally provided that the Management Authority issues an export permit. This, in turn, may only be done when scientific advice indicates that the trade "will not be detrimental to the survival" of the species.

In order to export skins under any of the systems described under Sections 1.2-1.4 above, the skins must be marked with a tag bearing a unique number. In practice, several countries also tag skins from Appendix II animals (1.5 above), and there are now few crocodile skins

in legal international trade that are not tagged. Resolution Conf. 8.14 was adopted in 1992 recommending that all crocodilian skins in international trade be tagged.

## 2. Basic requirements

Crocodile farming is a relatively new industry, subject to the whims of fashion in distant markets - markets which are typically beyond the farmer's influence. The industry is commonly based on wild crocodile populations which may be equally beyond the farmer's control. Any new crocodilian farming venture needs to appraise carefully all of the components and variables that may influence biological and commercial success. As a guide, the farmer should make sure his plan addresses each of the issues in the diagram. These are fundamental requirements and a pathway through them must be found! Crocodile farming requires a significant investment in facilities and stock. The "quality" of the skin of the target species is clearly very important. Everything else being equal, species with "classic" skins (small scales with few bony plates (osteoderms) in the belly scales) are likely to be more economical to farm than "non-classics" (e.g. caimans), as the value of the skin is appreciably higher.

## 3. Acquisition of stock

The three principal resources for successful crocodilian farming are stock, food and money. In some countries, especially developing countries, wild crocodilian eggs may be readily available at low cost, but there is no inexpensive food to feed growing crocodiles and often little money to develop facilities. In other countries, particularly developed countries, funds may be available for development and waste animal protein may be available for food - but there may be no wild crocodile resources upon which to base a sustainable utilization programme. In all countries, obtaining land suitable for crocodilian farming, especially in and around residential areas, may be difficult because of cost and/or zoning restrictions.

Because the majority of wild crocodilians occur in developing countries, the CSG encourages their sustainable use for skin and meat production. Using wildlife in this way is a legitimate conservation tool as long as the use is sustainable and it creates commercial or other incentives to conserve both the crocodilians and the wetland habitats they occupy. The CSG has expressed concern about the introduction of exotic crocodilians into countries for commercial purposes farming operations and " ... recommends that crocodile species should not be used for commercial farming operations outside their historical range where those operations are located within the range of other native species of crocodilians."

This section describes the main ways in which farms can obtain their commercial stock legitimately, and describes systems of production and management which ensure that conservation benefits result.

### 3.1. Captive breeding

The captive breeding of endangered species, for reintroduction to the wild, is a specialist area of conservation that uses farming technology, but has different goals - it is not treated in depth here.

Crocodilian species vary greatly in their social behaviour. Some are communal nesters in the wild, and these usually breed well in captivity - even if collected as adults from the wild and placed in captivity. The Nile Crocodile is a good example. Others, such as the Estuarine Crocodile and American Alligator, are solitary nesters in the wild, and they often show strong territoriality in captivity, even amongst females. They commonly perform poorly in captivity. However, all species of crocodilians have bred in captivity, and can perhaps be induced to do so on a commercial scale.

Captive breeding is essential if there are no wild crocodilians of commercial value, or if the wild resources are being utilized to their maximum extent. However, from a conservation viewpoint, ranching (see Section 3.2) is a preferred form of utilization where it is possible. Captive breeding was commonly recommended on the grounds that it takes the pressure off wild populations, even in places where wild egg resources are abundant. Until recently, CITES regulations made it more attractive than ranching, even in countries with large wild crocodilian populations. We now know that this approach is wrong. Where adults are taken from the wild to stock farms for captive breeding, there may be significant negative effects on the conservation of the wild populations. This is especially so where adults are in low densities. Captive breeding operations do not create direct incentives to protect wild populations and their habitats. Once a "closed farm" is operating, the conservation benefits may be minimal or nonexistent. Ranching, on the other hand, links the commercial viability of a farming operation directly to the maintenance of wild populations, and in many farms today, captive breeding and ranching go hand in hand.

Stock for captive breeding can be obtained either from the wild as adults or juveniles, or through the growing-out of raising stock. In many countries problem or nuisance animals can be used for stock, the alternative usually being their destruction. Capture and handling techniques are well established for all commercial species. Most techniques involve some degree of danger, either to the animal or the handler, and some require the use of specialist drugs.

Wild-caught adults should be housed in pens which provide the appropriate environmental conditions for that particular species. For example, Nile Crocodiles require deep and constant water levels, but appear "content" in large numbers in a small area. In contrast, adult Estuarine Crocodiles need lots of space, or enclosure in pairs, and appear to do well with shallow and even fluctuating water levels. The Common Caiman (*Caiman crocodilus*) appears to breed well in small, shallow ponds, even at high population densities.

Young animals suitable for growing out to breeding are often readily available from existing farms. Captive-reared stock are more tolerant of variable housing conditions and begin breeding at smaller sizes (and therefore sooner) than their wild counterparts. With Nile Crocodiles, for example, wild females rarely reproduce at sizes less than 2.7m total length (TL) whereas captive-raised females begin to lay eggs at 2.0m TL or smaller. In some species (e.g. Nile Crocodiles and Estuarine Crocodiles) captive-raised adults do not appear to breed as well as wild animals (nesting frequency, clutch size, egg quality), although this may be because of their age and housing conditions, and more research is needed. In contrast, captive-raised Common Caimans appear to nest more frequently and with larger clutch sizes than their wild counterparts.

It is impossible to generalize on the productivity of breeding stock. With the exception of Indian Muggers (*Crocodylus palustris*), most species nest once per year (some Muggers nest twice). Clutch size is highly variable between species, and clutch size, fertility and hatch rates within a species are affected by age, the early history of individuals, housing conditions and perhaps food. To obtain 1000 Nile Crocodile hatchlings may require only 30 female crocodiles. To obtain the same number of caiman hatchlings it would require 60 females, and for American alligator hatchlings, perhaps 100 females.

All captive breeding operations involving species in Appendix I of CITES are subject to a number of CITES Resolutions, and must be registered with the CITES Secretariat (Section 1).

### 3.2. Ranching

Ranching is a commercially viable strategy for crocodile farming which is widely used and has well accepted conservation advantages. The collection of eggs, hatchlings or juveniles from the wild gives natural populations a conspicuous economic value. Since wild clutches are often large and have a high fertility rate, ranching based on eggs is as cost-effective as captive breeding, and usually more so. However, the logistics associated with the collection of eggs, hatchlings and juveniles vary between species and localities.

Ranching strategies can involve a set quota of eggs or juveniles to be collected or as many as can be found. Where the extent of total recruitment collected is considered high, management programmes often require farmers to return 5-17% of collected animals back to the wild once they have reached a size at which predation is considered unlikely. Such compensation minimizes the impact of the harvest and clearly has the potential to exert a positive impact in terms of population size.

The time and duration of nesting are strongly correlated with the weather, particularly rainfall and temperature. As a general rule, nesting seasons tend to be extended in warm areas and contracted in cool areas. However, the type of nest (hole or mound) used by a particular species is also an important factor. For example, in northern Australia, Estuarine Crocodiles (mound nesters) nest during a six-month period spanning the wet season, when it is warm. Australian Freshwater Crocodiles (hole nesters) in the same region nest in a three-week period during the dry season - the only period of the year when conditions are warm and dry enough for eggs in the ground to incubate successfully. American Alligators (mound nesters) are also restricted to a three-week nesting period ("pulse" nesting), apparently for the same reasons.

Egg and hatchling collections from the wild are more efficient and economically feasible in areas where crocodilian densities are high, where their habitats are accessible logistically, where the species constructs an obvious mound nest, and where the population nests in a short pulse (information on eggs and incubation is in Section 4.2).

In some countries, for example Papua New Guinea and Irian Jaya (Indonesia), ranching involves the collection of older juveniles from the wild - animals which have dispersed from the nest site. This has proved to be one of the only feasible strategies of ranching where crocodilians live in heavily vegetated freshwater swamps, where nests are difficult to locate.

It also appears to be well suited to indigenous native hunters in remote areas, although the logistics of establishing buying networks can be formidable.

Since ranching involves the direct exploitation of wild resources, the populations concerned should be listed in Appendix II of CITES. Under special circumstances a local population may be transferred from Appendix I to Appendix II to encourage a ranching programme (Section 1).

## 4. Husbandry and management

### 4.1. Captive breeding

Maintaining a captive breeding colony can be expensive, as it can involve a significant area of land and high construction costs, in addition to feed, water and continual maintenance. If animals cannot be captured from the wild, the development of a captive breeding herd may be a long-term and costly commitment, since most commercially important crocodilians take six years or more before they breed successfully, i.e. before they produce significant numbers of viable hatchlings. Diet plays an important role in maintaining optimum breeding in captive animals. With at least some species, animals fed a red meat diet consistently have higher nesting, fertility and hatching rates than animals fed solely a fish diet. However, in some areas fish represents the only source of protein available, and with some species adults fed primarily fish do nest successfully year after year. It should be recognized clearly that some crocodilian species do not command a high market value for their skins, and for these species, the commercial viability of captive breeding and farming in general may need to be looked at very closely indeed; it may prove not to be warranted.

The biological and economic success of maintaining a captive crocodilian breeding group depends largely upon species, with factors such as sex ratios, land/water ratio and stocking rates varying greatly between them. Some species, like the American Alligator and Common Caiman nest on rising water levels, whereas species like the Nile Crocodile nest on falling water levels. Crocodilians are either solitary or colonial nesters. Captive propagation within colony nesting species has been accomplished with relative ease and a high degree of success, but the solitary nesting habits of other species make captive propagation more complex. For these, space requirements with respect to both stocking rates and sex ratio are difficult to satisfy and for the most part have created major problems in establishing economically sound breeding programs. Problems associated with the commercially viable breeding of solitary nesting species are currently being investigated. Broad generalizations with respect to the technology of captive breeding are impossible.

In evaluating captive breeding success, the number of viable hatchlings produced per adult maintained in captivity is perhaps the only meaningful measure of success. The quality of eggs laid can vary tremendously, and in many captive breeding situations infertility and early embryonic deaths (prior to laying) can render 60-70% of eggs non-viable.

A brief review of successful systems for the four most commercially important species exemplify the different strategies that are employed on crocodile farms.

**The Nile Crocodile.** The Nile Crocodile is a social, communal nesting species. In modern facilities, females can be grown from hatchlings to breeding (at about 1.8-2.0m) in six years, but good fertility, hatching and hatchling quality are rarely achieved before eight years. Wild females rarely nest before they are 2.7m, which may take up to 30 years, but such age-size relationships are strongly population specific. The reduced age at nesting in captive-raised stock appears to be a function of their early rapid growth since wild caught females of 1.8-2.0m do not start breeding until they would normally do so in the wild, irrespective of the conditions under which they are maintained in captivity. Males will mate with females of the same age, but such unions are rarely successful. It is more usual to keep females with larger, older males.

Wild-caught animals and those grown-out under farm conditions differ markedly in the extent to which they will tolerate other adults and breed successfully in different housing conditions. Wild animals "tame" down and accept human disturbance well, but do so quicker if isolated and left undisturbed. Wild caught females respond well where captive conditions simulate the wild: pools with deep and shallow areas, and reasonably stable water levels (pools should never be emptied). As a hole nester, Nile Crocodiles look for nesting areas about 1m above water levels and suitable raised banks should be provided about 2m from the water. These should be adjacent to shade and facing west to catch the afternoon sun.

Farm-reared animals have less rigorous requirements and will lay eggs in shallow, concrete rearing enclosures which are drained and cleaned regularly. However, even these animals are more productive if water depth is constant and suitable nesting areas are provided.

Two main breeding systems for Nile Crocodiles have emerged on crocodile farms: a few females kept in a small enclosure with one male (most common), and anything up to 300 females kept with multiple males (as many as 60) in ponds up to several hectares in size. It is not possible to compare stocking density and sex ratio data and relate the performance and efficiency of these two systems precisely, because data from multiple male systems are not available. However, some general observations can be made. The main advantage of large, multiple male systems is that the presence of one infertile male is unlikely to result in the loss of a whole year's production. Set against this are the often severely damaging territorial conflicts which occur between males when they are introduced to the enclosure. There is a high likelihood that only a few males are actually engaged in mating activities, the rest being maintained to no advantage. It is also difficult to follow and record the reproductive history of females in such large systems and management at the level of individual crocodiles is virtually impossible.

In small enclosures, one male may be sufficient for 20 females, but 6-10 are more usual and 8 is recommended. The females should all be of a similar size, with the male 20-40% bigger. Enclosures should be designed to give wild females 8-10$m^2$ water surface each, but farm-reared animals will be "happy" with half this space. A simple rectangular pool will suffice, but a moat-like configuration with an island is preferred. If the security fence is set 5-6m back from the water so that burrowing animals cannot escape, the pools can be of simple earth construction. Concrete basins are acceptable, though expensive. The most efficient and cost-effective pens have been made by impounding small, natural drainage lines.

In small breeding groups, 90-100% of females can be expected to nest for 20 years, and possibly much more. Monitoring and individual management are easy and, with good design, pools can be drained and refilled quickly should individuals need to be removed. The principal disadvantage is that a whole season's production may be lost if a male is incompatible or otherwise non-viable. This occurs in about 10% of such groups, although the system allows rapid identification and replacement of these males.

**The Estuarine Crocodile.** Estuarine Crocodiles are solitary mound nesters, which in the wild rarely nest within sight of each other. Under captive conditions females may reach maturity (2.0-2.3m) in eight years, but it may take longer before larger clutches of viable eggs are produced. Females are also highly territorial and the "optimum" breeding system is a matter of conjecture and debate.

The two most common breeding systems used on crocodile farms are large communal pens, typically with multiple females and males in large ponds, and/or small breeding enclosures with 1 male and 1-5 females. In all cases it is "thought" that falling water levels prior to the nesting season restrict nesting, although definitive data are lacking. Similarly, it is "thought" that captive-raised adults are more tolerant and less territorial than their wild caught counterparts, although there are conflicting data.

The proportion of adult females that nest in large communal pens varies from year to year, and this may reflect general ambient weather conditions (the same variation occurs in the wild) as well as other factors (food, pen design, etc.). In some enclosures, with young, farm-raised adults, 90-100% of females have been reported to nest, although this is the exception rather than the rule. With time, and increasing sizes of the adults, this proportion seems to decrease significantly and in some communal pens it may reach only 20-30%. The quality of eggs laid is one of the main variables. In general, large communal pens probably give an average of 30% viable eggs, although it may be higher initially (especially with farm-raised stock) and greatly reduced with increasing adult age. Pen design, water quality, and food may be far more important than hitherto realized.

In small breeding groups, mixed results have been obtained. Once single pairs nest successfully, they appear to do so annually with large clutch sizes and high egg viability. Relatively small areas of water may be needed for each pair (20-30$m^2$), and they appear to do better if shade and clean or circulated water are provided. In larger groups (1m:2f, 1m:3f ... 1m:5f), there has been much variation. Wild adults placed in such groups usually result in one or two "good" clutches, and often the females kill each other. With farm-raised stock, the situation is unclear. Pen design may be more important than is generally recognized, as some larger groups appear to settle well over time and give high numbers of hatchlings per female.

The "best" strategy depends partly on economics. Large enclosures with large numbers of males and females are generally cheaper to build and the losses due to poor egg quality over time may simply be a burden that has to be carried - if there are enough hatchlings produced, it may not matter. However, single pairs are perhaps the most reliable breeding system if pens are constructed wisely. The pens should be partly subdivided so that the male and female can separate from each other, they should be visually isolated from adjacent pens, and

they should have constant water levels and water at least 1.0-1.2m deep. Single pairs fed fish appear to reproduce as successfully as those fed red meat or chicken.

**The American Alligator.** The American Alligator is a solitary, mound nesting species. In the extreme southern and warmer portion of its range, age at sexual maturity for captive alligators reared in controlled environment chambers for the first 3 years of life, then placed in outside pens, is 5.8 years. However, good fertility, clutch size and hatchling quality are rarely achieved before 8 years. Age at sexual maturity for wild alligators in Louisiana is 9.8 years, which is the same for captive alligators raised in semi-natural outdoor pens (without artificial heating); good fertility rates, clutch sizes and hatchling quality are not achieved in these animals until 13 years.

Environmental parameters vary considerably throughout the range of American Alligators and play an important role in regulating the age of sexual maturity. In the extreme northern part of the range, sexual maturity (1.8m) takes 15 years for females and 18-19 years for males. The reduced age to maturity in captive alligators raised in controlled environment chambers reflects primarily the high and stable temperatures maintained. In the wild, the animals are exposed to temperatures which fluctuate greatly and are generally much lower.

Alligators of both sexes are territorial and usually wild females do not nest within sight of another nesting female. However, females raised totally in captivity are more tolerant of each other, can be stocked at higher densities, and are more reliable nesters than wild-caught females brought into captivity. It is recommended that stocking densities should not exceed 2 females per acre with a sex ratio of 1m:3f. The proportion of young adult females that nest each year in large communal pens varies slightly from year to year, averaging 65-70%. The reproductive performance of wild-caught sub-adults raised in semi-natural breeding enclosures is now being compared with that of wild-caught adults.

Diet can have a significant impact on alligator productivity. Alligators fed a diet of red meat consistently produce larger clutches and have higher nesting, fertility and hatching rates than those fed fish. Nevertheless, production from alligators maintained in communal pens gradually declines with age, with up to a 50% decrease in nesting, fertility and hatching rates within 20 years. To enhance the productivity of middle-aged females, research is currently being directed at the source of stock (wild or captive-raised), stocking densities, stress levels, diet and pen designs, which include smaller pens containing single pairs (1m:1f).

Pen designs for single pairs should include deep open water for mating and isolation ponds for nesting, with adequate vegetation for both nesting material and cover. Preliminary results indicate higher nesting rates (compared to communal pens), but unacceptably low fertility and hatching rates.

Recent data indicate that the normal diet of fresh or freshly frozen foods may be inadequate for breeders, and the development of a nutritionally complete, food in pellet form for them is currently being researched.

Regardless of pen design and stocking rates, breeding pens should incorporate pumps that can supply adequate water on demand, especially during periods of prolonged drought. Breeding ponds should be at least 2m deep, and be maintained at that level year round, but

should ideally be increased during courtship (spring) to encourage breeding. If water is not added during droughts, an entire year's nesting effort may be lost. Rainfall and its related effects on accrued surface water influence the proportion of the total female population which nest each year: it is reduced when water levels are high or low. Perimeter fencing should be buried at least 15cm into the ground to avoid tunnelling/burrowing and should be at least 1.8m high, and 5-6m from the water's edge.

**The Common Caiman.** Caiman appear to be among the least territorial of crocodilians. To achieve efficient reproduction, wild-caught females should be 1.2-1.4m, and males 1.6-1.9m. Females should weigh 4-12kg and males not more than 24kg. There is observable variation in the degree to which individuals adapt to their enclosed breeding pens, but the presence of some "well-adapted" animals seems to contribute to the settling down of others. Captive-raised female caiman can reach sexual maturity (1.0-1.2m) in 2.8 years, which is appreciably shorter than any other known crocodilian species. Furthermore, captive-raised females settle and reproduce better than their wild-caught counterparts.

Caiman prefer to build their own nest, but will share their nest with other females if necessary. Each female needs 30-35kg of dry vegetation to build a nest. From an economic standpoint, a sex ratio of 2f:1m results in the most efficient production (hatchlings produced per adult maintained). Ideally there should be 30m$^2$ of pen space per adult.

Caiman breed well in captivity if provided with similar environmental conditions to those found in the wild - shade, high humidity and temperature (especially during the nesting season), irregularly shaped ponds and water depth to a maximum of 1.5m. To simplify management, pen sizes no larger than 2500m$^2$ are recommended, and these should ideally be composed of 70% land and 30% water, and contain about 80 animals.

### 4.2. Egg management

Recent research has dramatically improved our knowledge of crocodilian eggs, embryos and optimal incubation environments, which has obvious application to crocodilian farming.

#### 4.2.1 Egg structure and embryonic development

The eggs of crocodilians vary in size (40-140g), but all have a hard calcified shell attached to a fibrous eggshell membrane. Inside the eggshell membrane is the albumen (egg "white") and yolk: the yolk is itself enclosed within a very thin membrane (the vitelline membrane).

The calcified portion of the shell can appear smooth (most crocodilians) or rough (caimans), but always contains networks of fine pores passing through it. They may not be obvious to the naked eye, but the pores are vital for the transport of oxygen (into the embryo) and carbon dioxide (out from the embryo). If an egg is placed under water, gas exchange ceases and the embryo dies. The pores are also sites through which water can be drawn into the egg, causing it to swell, or be lost from the egg through dehydration, often causing it to collapse. The incubation environment (see Section 4.2.3) should be such that water losses and gains are minimal. Air spaces are not a normal feature of crocodilian eggs, and if present they indicate dehydration.

The yolk, surrounded by the vitelline membrane, is the central unit of an egg. It contains the vital embryonic material and most of the nutrients that will maintain the embryo. It starts as a small sphere in the ovary, and grows in size as food supplies are built up in it. When it is mature (large), the yolk/ova leaves the ovary and enters the oviduct (ovulation). Here it is fertilized and essentially packaged in albumen (which is the main water supply for the embryo), egg shell membrane (controls gas exchange) and the eggshell (water exchange and mechanical protection). The eggshell provides calcium and magnesium for embryonic bone development.

Clutch size and egg size vary within and between species. For example, in Australia, Estuarine Crocodiles have a mean clutch size of 50 eggs, and a mean egg size of 113g, whereas Australian Freshwater Crocodiles have a mean clutch size of 13 eggs with a mean egg size of 68g. Hatchling size is related to egg size, the average Estuarine Crocodile hatchling being 64% of egg weight (72g) and the average Australian Freshwater Crocodile hatchling 62% of egg weight (42g). Within a species, larger (older) females tend to lay larger eggs, which produce larger hatchlings.

**Embryology and opaque banding of the shell.** At the time of laying, the outside of the egg is covered with mucus from the oviduct. All eggs in a clutch contain embryos at about the same stage of development (about 4mm long), which are attached to the inside of the vitelline membrane which surrounds the yolk. The ball of yolk swings (rotates) freely within the albumen if the egg is moved. At or about the time of laying, water from the albumen is drawn in by the embryo, and deposited within the yolk. Since this fluid is less dense than the surrounding yolk, it and the embryo (where the water enters) swing to the top, regardless of the orientation of the egg.

Within 24 hours of laying, the albumen directly above the embryo is dehydrated and the embryo and part of the vitelline membrane becomes attached to the eggshell membrane. This dehydration affects the structure of the eggshell membrane, which in turn causes an opaque spot on the shell (at a site overlying the embryo). If eggs are rotated before the embryo adheres to the eggshell membrane, then the yolk will swing back and normal development occurs. However, after the embryo adheres (opaque spot forms), the yolk can no longer swing, and if the egg is inverted the embryo will remain at the bottom, under the yolk, and will die. Unlike most birds, crocodilians do not turn their eggs during incubation.

After the embryo is attached to the shell membrane (causing the opaque spot), albumen dehydration continues and more and more water is transported into the yolk, where it floats to the top, beneath the embryo. The dehydration is responsible for the opaque spot expanding to a band around the midpoint of the egg. It is within this band that the attached embryo grows initially. Later, the embryo develops a sac (allantois) in which it places waste products, and the outside surface of this sac becomes covered in blood vessels and extends out from what is now an opaque band, towards either end of the egg. At this time, the remainder of the egg becomes opaque. The development of the embryo and its membranes is thus mirrored, to some extent, by the pattern of opaque banding on the egg, and this can be used to distinguish eggs that cease developing.

Within the egg, the embryo also develops a yolk sac membrane (not to be confused with the vitelline membrane) which surrounds the yolk contents and transports nutrients into the embryo.

Infertile eggs do not band and rarely become infected; the yolk and albumen are both thought to contain important anti-microbial defences. When an infertile egg is opened the albumen appears uniformly translucent and the yolk is uniformly yellow. Eggs which have been fertilized but died within the oviducts of the female are very similar to infertile eggs: they almost never band and show minimal degradation during incubation.

**Monitoring embryonic development.** From a management point of view, it is important to be able to distinguish between good and bad quality eggs (a problem with adults) and good and bad incubation (a problem with the incubation environment). It is thus important to be able to identify infertile eggs, or early embryonic deaths, before incubation starts. Some egg husbandry regimes involve the detection and removal of dead eggs during incubation, such that a complete inventory can be made of the problems - the age at which embryos died, etc.

The pattern of banding can be used as an approximate guide to embryo age. However, the rate at which the band forms can be affected by incubation temperature and humidity, and thus aberrations do occur. For example, in very wet conditions the band may not complete. The band can be used to identify non-viable eggs (infertile and early embryonic deaths do not develop a band), to monitor continuing development of embryos (the band changes with time), and to isolate eggs within a clutch that have died (where the band remains constant relative to that in other eggs).

Candling can also be used to monitor embryonic development in crocodile eggs. With freshly laid eggs (before the opaque spot appears), a strong light behind the egg is sufficient to allow the extent of fluids in the yolk to be seen. If there is no fluid, the egg is infertile or an early embryonic death occurred (i.e. the egg died in the female's oviducts). Later, blood and blood vessels can sometimes be seen through the opaque area on the shell.

Assuming optimal incubation conditions, embryonic deaths usually show two peaks: one early and one late in incubation. Early deaths are thought to reflect a range of different problems: for example, nutritional deficiencies in the adults; stress of breeding adults; adverse incubation conditions prior to egg collection; and mechanical damage when moving eggs. Late embryonic deaths typically occur when the embryo is maximizing growth and they appear to reflect an inability of the embryo to access the resources needed (oxygen, water and nutrients from the yolk) and assimilate them.. In some cases they are embryos which have been compromised early in incubation by the factors listed above, but in other cases the reasons are unclear. Suboptimal incubation conditions (dehydration, too hot or cold, insufficient gas exchange) may not kill young embryos, whose resource needs are small, but may result in increased mortality when resource needs are greatly increased towards the end of incubation.

### 4.2.2. Handling and transport.

Where possible, eggs should be collected and moved as soon as possible after laying - ideally within the first 24 hours. At this time the embryo has not yet attached to the shell membrane (no opaque spot or band has formed), and thus there is no risk of orienting eggs with the embryo at the bottom. Eggs laid vertically in the nest (in which embryos sometimes develop abnormally) can be corrected (oriented horizontally); the embryo will reorient to the top. It allows total control over the complete incubation period, and if incubation conditions are stable, hatching will be synchronized. From a wildlife management point of view, early collection reduces losses to predators, desiccation, flooding and suboptimal temperatures, and in crowded breeding pens restricts damage to the eggs by females nesting in mounds that already contain eggs.

Geographical and logistical circumstances often prevent egg collection on the day of laying. Eggs can be successfully collected and transported at any stage of development, although more care is needed at some stages. Embryos seem more sensitive to mechanical injury when approximately 8-12 days old although, if reasonable care is taken to prevent sudden mechanical shocks, they too can be collected and transported successfully.

Regardless of embryo age, it is important to ensure that the eggs are not overheated (34°C) during collection and transportation. Temperatures around 30°C or less will not cause problems, whereas temperatures of 34°C or more are more likely to do so. It is always advisable to measure the temperature of the clutch (2-3 eggs deep) before collection, as high temperatures on the day of laying or soon after can be an important cause of mortality. Clearly, eggs should not be kept in dry, exposed positions where they are likely to dehydrate.

Eggs should be gently removed from the nest, preserving their orientation in the horizontal plane - a line from a pencil along the top of the egg will allow orientation to be maintained. If an opaque spot has developed, that spot should be directly above the embryo; if it is not, the egg should be oriented so that the spot is on the top. Concern has been expressed about using felt pens to write on eggs (it is felt that the solvents may affect the embryos), although many operators use them and to our knowledge there are no data indicating a link between their use and increased mortality.

Eggs can be packed in a variety of containers, but insulated ones may assist temperature control. Nesting media or vermiculite are usually packed around the eggs to prevent them rolling and to maintain temperature and humidity.

When preparing eggs for incubation, some operators neither wash nor examine the eggs closely. Others wash the eggs and remove all detritus and then write the details (clutch and egg number) on each egg. Both approaches give high success rates and are really a matter of choice.

### 4.2.3. Incubation

The incubation environment is extremely important. It influences the rate of embryonic development and growth, hatching time, embryonic mortality rate and sex. Furthermore, there is increasing evidence that the incubation conditions affect the later (after hatching)

performance: growth rates, survival rates, and perhaps other attributes. In short, relatively minor fluctuations in the incubation environment may exert major long-lasting effects of commercial significance. The three major variables of the incubation environment are temperature, humidity and gas exchange.

**Temperature.** For most crocodilian species, eggs can be successfully incubated at constant temperatures between 30°C and 33°C; outside this range embryonic mortality increases markedly. Within the range, 32 ± 0.5°C is usually considered optimal for post-hatching growth, although with most species it will produce mainly males (see below). Although constant temperature incubation is usually recommended, and typically gives good results, there is room for more research. The results of fluctuating versus constant temperature need to be investigated. Furthermore, during the later stages of normal development in wild nests, temperatures commonly increase by 1-2°C because of the production of metabolic heat by the growing embryos. It is likely that such increases accelerate yolk utilization and embryonic growth, and perhaps facilitate hatching. There may well prove to be advantages in steadily increasing incubation temperatures during the last 2-3 weeks of incubation, although definitive research results are lacking. Some species, for example Australian Freshwater Crocodiles, are subjected to steadily increasing incubation temperatures in the field, and higher hatch rates and hatchling quality are obtained with escalating rather than constant temperature incubation. However, this species appears to be the exception rather than the rule. Clearly, eggs incubated in nesting material within an incubator are subject to temperature increases from metabolic heat anyway (even though this may not be reflected in the temperature of the incubator air space), and increasing the incubation temperature may cause lethal limits to be reached.

All crocodilians have temperature-dependent sex determination. The basic pattern appears to be high and low temperature females (typically <31°C and >33°C), with a band of males in the middle (close to 100% at 32°C). Some species appear to lack high temperature females, or at least have the temperature inducing them 34°C or higher, which approaches lethal limits. Sex is known to be determined during the first half of embryonic development.

Total incubation time is highly correlated with incubation temperature. For example, Australian Freshwater Crocodiles take 123 days to incubate at 28°C, 90 days at 30°C, 76 days at 32°C and 64 days at 34°C. This reflects the profound effects of temperature on embryonic growth rates, and these effects appear to endow the embryos with different potentials to grow after hatching. In general, the best growth rates are obtained at the temperatures which produce the highest percentage of males. From an evolutionary point of view, the mechanism appears to be one that allocates "maleness" to the embryos with the best potential of growing to a large size after hatching; i.e. small and large females may still be mated, but small males may contribute little if anything to the population.

**Humidity and gases.** Crocodilian eggs need to be incubated under conditions of high humidity (99+%), but should not be incubated in direct contact with water. Under low humidity conditions, dehydration occurs and will be first indicated by airspaces within the egg. They can be seen easily by candling. Although some species can withstand significant (<20%) losses of water, it is highly likely that the embryos will be compromised. Extreme dehydration can cause grossly abnormal hatchlings, and even mild dehydration may affect the movement of minerals from the shell to the embryo, which may in turn affect hatching

(it is thought that the shell may not be weakened enough). In contrast, if eggs are in direct contact with water, it will flow into the egg (especially during the second half of incubation). The egg will swell appreciably, causing longitudinal cracks in the shell, and sometimes the contents will burst through the shell membrane. Direct spray on eggs can cause beads of water over the egg, which can interfere with gas exchange through the pores.

In general, crocodilian embryos are tolerant of fairly high levels of carbon dioxide and low levels of oxygen, but they require more oxygen and increased rates of carbon dioxide loss during the last third of incubation when growth is maximized. At this time, embryos in eggs which are too wet often die or hatch prematurely (often with the yolk still external). Similarly, if incubation temperature is increased towards the end of incubation, gas exchange needs will be accelerated, and it may be necessary to pump more air into the incubator.

**Incubators.** An enormous variety of incubators are used successfully with crocodile eggs, and there is no single "ideal" system. In general, incubation in artificial nests is risky, because the incubation conditions cannot be easily controlled. Yet in Thailand, most eggs are incubated in nests or in holes in the ground, with the thermal environment monitored closely. In some cases the nests are constructed a specific distance above the water table, to maintain humidity.

Controlled temperature chambers are a common approach to egg incubation. These can be purchased or constructed in a variety of ways, as long as the optimum incubation environment can be maintained. Water-jacketed temperature cabinets are becoming more popular. If kept in a cool location, they only need a heating circuit to be able to maintain the desired incubation temperature. Fans and cooling circuits need to be evaluated carefully, as they may lower the humidity. Eggs are typically laid out on racks, and humidity is maintained by pumping air through a water reservoir within the incubator: i.e., temperature is maintained precisely and humidity and gas exchange are maximized.

Many farmers place eggs within some kind of moist nesting medium (sand, vegetation or vermiculite), within trays or boxes, which are then stored in large "walk-in" rooms. They may have warm water sprays on the inside to increase humidity and various mechanisms for controlling temperature. The advantage of such systems is that the eggs are buffered (in the boxes) from changes in both temperature and humidity, although rises in temperature due to metabolic heat are not controlled. A disadvantage is that eggs cannot be regularly inspected throughout incubation. Regular inspection allows the early detection, removal and examination of dead eggs, which in turn allows information on the age and perhaps cause of death to be established. Clearly, excessive or rough handling of eggs is to be avoided.

**Record keeping.** Although incubation success and hatchling performance can be affected by incubation conditions, "clutch" effects (genetic effects) are very pronounced in crocodilians. By maintaining careful breeding and incubation records it may be possible to evaluate the performance of specific adults, and to determine whether they are above or below average. Good record keeping should ideally address both male and female reproductive success. It is widely recognized that "first" clutches (young females) contain high proportions of infertile or abnormal eggs, and that old females show a variety of anomalies. However, there is simply a paucity of information on the relationship between clutch characteristics and age for most species of crocodilians, regardless of the commercial

implications of such data. Similarly, the reproductive performance of males has tended to be ignored, yet it is clearly a critical area for investigation and management. Detailed record keeping and analysis of all failed eggs are critical to an objective evaluation of reproductive success.

### 4.2.4. Hatching

The final stages of development involve the embryos drawing the remainder of the yolk (the residual yolk) into the body cavity. Once this is completed, embryos may begin making high pitched chirping noises from inside the egg. In the wild, these vocalizations stimulate the adult female to uncover the nest. In an incubator it is often stated that vocalizations from one nest can stimulate another to hatch prematurely, yet with at least some species this does not appear to occur.

Hatching is initiated by the fully developed embryo using its "egg tooth" (caruncle - a small calcareous outgrowth on the snout) to cut through the shell membrane and puncture ("pip") the egg-shell. This can be followed by a burst of activity in which the hatchling leaves the egg, or there can be a delay between pipping and hatching of at least a day. Unlike birds, crocodilians contain significant volumes of fluids in the egg (particularly those containing dissolved waste products), and at the time of hatching these need to be accounted for (they should not be allowed to drip all over eggs still developing).

Where eggs are incubated on racks, with even temperature, all eggs in a particular clutch can be expected to develop at the same rate. A pipped egg is usually removed and hatched by hand. Although a few individuals may pip early (when premature), once the majority of a clutch has hatched, any that have not pipped should be hatched by hand. Some individuals may have difficulty hatching and will die if not assisted (some evidence indicates such animals tend to perform poorly in any case).

Where incubated in holes in the ground, nests, or other situations where temperature gradients occur, or if eggs have been collected from the field late in development such that they have already been subject to such temperature gradients, hatching within a clutch may not be as highly synchronized (i.e. different eggs may have been developing at different rates).

During the rapid growth phase of development (last half of incubation), embryos are capable of making numerous adjustments to increase their chances of survival. For example, if resources are lacking (e.g. not enough oxygen) or are approaching critical limits (temperature too high), the embryo will start to complete its development early, and may hatch as a small animal with a large residual yolk. It has essentially "packed its bags and got out" before reaching conditions that would lead to its death." In contrast, at cooler temperatures (say 30°C), embryos may delay hatching, such that they hatch at a larger size, but with minimal amounts of residual yolk. At very low incubation temperatures (28-29°C), normal yolk utilization is impaired, and many embryos die in the egg, still with external yolk. The residual yolk is a food supply used by the hatching during the first few weeks. Hatchlings with a large residual yolk should be kept at fairly high temperatures (34°C) to facilitate its absorption. Hatchlings with external yolk usually die.

### 4.3 Rearing

Whilst there is no standard way of raising crocodilians commercially, there are fundamental principles and biological details common to all species. Once new producers are aware of these principles they are advised to look at as many different farms as possible to see the range of designs that other farmers have devised around them. Limited research data suggest that features such as the size and shape of pens, and the amount and nature of light, are not inherently important to growth and survival. In contrast, hygiene or temperature control may be critically important. Much more research on the factors which influence raising success is needed, and until it is done, it is impossible to make definitive recommendations about production systems.

#### 4.3.1. Basic principles

Growth in terms of body mass should increase exponentially, and if it only increases linearly, it is usually a sign that something is not optimal. Food conversion rates decline as an animal grows, and thus the annual consumption of feed will increase markedly with time and increased body size. To make the most efficient use of food and restrict the number of pens required, most farmers try to grow crocodiles to skinning size in the shortest possible time, while minimizing mortality. To achieve these goals, farmers have devised buildings and systems of management which meet the requirements dictated by four basic principles:

i. Good incubation and neonatal treatment
ii. Maintenance of a high metabolic rate
iii. Elimination of stress
iv. Adequate nutrition.

**Incubation and neonatal treatment.** The conditions of incubation strongly influence subsequent growth and survival. Hatching and the treatment of neonatals in the first few weeks after hatching are also critical. Whether an animal will be large by two years of age can usually be quite accurately predicted within the first few months, and even weeks. Not enough controlled research has been done on neonatals, and their treatment varies greatly between farms. However, good results are achieved where the hatchlings are always treated gently. Some farmers promote a 6-12 hour rest period after hatching, at 32-34°C, either in dry or wet (shallow water) conditions, before transfer to the enclosures where they will be raised for the next few months. Others maintain them in the incubator for the first day or two. In general, hatchlings should immediately be subjected to the conditions they will experience later, and these should be unchanging.

Nile Crocodiles, seem to prefer and benefit from slightly higher temperatures than older juveniles. Some farms successfully keep them at 34°C for the first 4-6 weeks, before dropping the temperature to between 30°C and 32°C. In other species (e.g. American Alligators), increasing temperature immediately after hatching can lead to heat stress and disease. With Estuarine Crocodiles, transferring hatchlings directly from the incubator to the raising pens at 32°C gives high survival and growth rates.

Hatchlings of American Alligators seem to initiate feeding on dry rations or mixes of meat and/or fish within a few days of hatching without any difficulty. Yet with other species, for

example Nile Crocodiles, hatchlings may need to be introduced to live food (winged termites, tadpoles and small live fish have been used) to induce feeding. Movement of the prey seems to be the key element, and small pieces of meat and/or fish thrown towards hatchlings will usually be snapped up. Once a few individuals are feeding keenly the rest usually follow. Some farmers of Estuarine Crocodiles and Common Caimans introduce small feeding animals from the previous year ("starters") to "teach" the newborn how to feed. Animals which hatch with large reserves of yolk in a round and bulging belly are sometimes subjected to special treatment. Nile Crocodiles appear to survive and grow better if kept in water at 34°C without feeding until they slim down, and Common Caimans if they are maintained at the same temperature, oxygen and humidity environment at which the eggs were incubated. In both cases it may take over a week until they appear "normal" and are introduced into the hatchling pens.

The palatability of different foods and the way in which they affect hatchling growth appear to be variable between species and between clutches within the one species. In addition, the response to changing diets is variable. Red meat seems to be preferred, and seems to give superior growth to fish. With Nile Crocodiles a change from fish to red meat is usually both easy and beneficial, whereas a change in the opposite direction can produce animals which refuse to eat and eventually die. In contrast, American Alligators switch between diets with ease. In order to induce feeding some farmers keep neonatals in their clutches and offer them a variety of foods, some of which may be quite exotic and expensive, until they eat with relish. However, there may be problems when the farmer tries to change the diet to one which is commercially viable, including artificial rations which are becoming more popular.

**Maintaining a high metabolic rate.** Under optimum conditions a hatchling crocodilian has a high metabolic rate, nearly half that of a man, while an adult's is less than one-tenth as much. A high metabolic rate means a high food requirement and rapid growth in terms of percent gain. The largest adult animals are incapable of rapid growth (i.e. percent increase in weight) under any circumstances, since they cannot supply much energy for the purpose. Temperature affects the metabolic rate of crocodilians and, by and large, their environment determines their temperature.

The marked improvement in the growth and survival of crocodilians held at temperatures between 30°C and 32°C over those kept only a degree or so cooler is well documented, as is the way in which temperature affects digestion, absorption and assimilation in these animals. Feeding at temperatures of 30-32°C produces the maximum metabolic rate in hatchlings of several species and a search for an exact optimum is unwarranted since it will vary between individuals depending on their clutch of origin and incubation temperature, amongst other things. However, the nature and degree of this variation do require investigation.

While the commercial benefits of a high metabolic rate in young crocodiles are accepted, there is some disagreement on the way that temperature should be used as a tool in production. Ecological studies of thermoregulation in crocodilians commonly refer to "preferred" temperatures and it is clear that wild animals deliberately vary their body temperature in response to their physiological state. Thus, a recently fed crocodile will try to raise its temperature to achieve its maximum metabolic rate and digestion, while a starved

animal may try and lower its temperature to save energy. Sick or diseased animals may display behaviourial fever. As a result of these observations, some people are of the opinion that farmed animals should be given a chance to thermoregulate within a thermal gradient. The more traditional approach is to maintain a constant ambient temperature at or near that which a healthy, recently fed animal would select.

Three pieces of information appear to support the second approach: firstly, crocodiles given a choice of temperatures do not seem to feed as frequently nor approach their maximum growth potential as closely as those held at the "optimum" for digestion; secondly, the ability to convert food into body tissue is affected by the frequency of feeding which, as noted, is highest at suitable constant temperatures; and thirdly, animals under these constant conditions are very resistant to disease, providing they are not otherwise stressed. There is, however, one problem with constant temperature culture. Although not well quantified, even temperature drops of short duration appear to have a pronounced effect on feeding and growth, which can continue even after the temperature has been rectified. To prevent fluctuations in temperature, and their adverse effects on feeding and growth, many farmers use preheated water for washing pens down and refilling them after cleaning.

It is rare to find natural climatic conditions which are ideal for the commercial rearing of crocodilians and even in the tropics farmers are usually more successful where their animals are kept in an artificial environment. Almost all farmers maintain such an environment, with high, constant temperatures, by keeping their animals in heated water. Although heating systems vary considerably, they usually involve considerable recurrent expenditure. To conserve energy, systems have been devised where animals are kept in shallow water in well insulated enclosures and such constraints have imparted a degree of similarity to farms around the world.

**Eliminating stress.** Every crocodilian farmer recognizes "stress". Commonly, the animals huddle in piles, are excitable and have reduced appetite. Avoiding stress is the farmer's perpetual problem. Stress, however, is often hard to explain and pin down. Obvious stimuli, such as inordinately high or fluctuating temperatures, dehydration, noise, movement and handling often result in obvious stress symptoms, such as piling. However, more subtle stresses, which often escape attention, can slow growth. It is known that inadequate individual space can be stressful, even though this is not obvious until considerable growth has been lost. Stocking densities are poorly understood. The interaction and relative importance of animal size, stocking rate, enclosure area and feeding space have received only cursory scientific investigation. Although relatively little information is available on stress in crocodilians, there is vast literature on stress in other animals, and the pathology appears to be broadly similar. Chronic stress induces changes in leucocyte counts and reduces immunity; it also results in raised levels of corticosterone (which promises, as in other animals, to be an indicator for quantifying stress).

To understand and avoid stress it helps to understand that stress may be pathological in captivity but in nature it has a survival value. Predators feeding on hatchlings would normally do so with a flurry of activity and the piling response of young crocodilians to unusual noises and other factors probably enhances the chances of an individual avoiding being eaten. Stress is therefore something induced by perceived stimuli - something heard, seen, smelt or felt which acts as a switch. With care in raising, stress may never be

switched on, but once on it cannot necessarily be switched off immediately by removing the stimulus. Thus avoidance is essential. Unfortunately, some stress is inevitable in any management system. For example, handling and grading can be very stressful, but so is the alternative situation where some individuals are allowed to dominate others in an enclosure.

A further complicating factor is possible intraspecific, geographic variation in the degree of wariness. For example, Australian Freshwater Crocodile hatchlings from some areas show little wariness and will readily expose themselves during daylight hours to feed, regardless of whether people are there or not. Hatchlings from other areas are extremely wary of exposing themselves in the daylight hours, or when people are present, and appear inherently more wary. It is thought that such differences may reflect adaptations to long periods of Aboriginal hunting in some areas.

There are three principal approaches to coping with disturbance stress in commercial production. In the first, artificial screens are provided, often low over the water, to take advantage of the hatchling's natural desire to find cover, under which it feels secure. In the second, the animals are reared in the dark, isolated from many stimuli. In the third, the animals are acclimatized to disturbance through constant background music or other noise and activity. None of these options is well researched and all have been more appropriate and successful in some situations than others. It is relatively easy for farms in which the animals are held within enclosed, insulated chambers to exclude light and other external stimuli, and introduce constant noise. However, farms in the tropics, which use little energy, often find it cheaper to construct simple facilities without lids or roofs, and in these situations screens may be the only viable option.

Finally, successful farms all have a strict routine in which management activities such as feeding are consistent. In the extreme, a regime may require workers to wear the same colour overalls, enter the enclosures in the same place and clean in exactly the same way on every occasion!

**Adequate nutrition.** As in any intensively raised animal, nutritional deficiencies occur and can have significant effects on growth and mortality. At the extreme, animals may be under- or overfed, but more usually they are deficient in important dietary minerals and vitamins.

Information on the basic nutritional needs of crocodilians is only now being clarified, and the role of some components, for example fatty acids, is in need of further experimentation. However, the lack of definitive information on nutrition need not be a major constraint to commercial production - although it may well make it more efficient in the future. The bulk of the diet of wild crocodilians is animal protein, and providing adequate nutrition for captive animals can be a relatively simple matter of supplying fresh food, usually red meat, fish or chicken, with calcium and vitamin supplements. Growth on these diets can be equally good, and generally better than on fish which has been stored (frozen). However, there are often some individuals which refuse to eat fish and the conversion rate on a dry matter basis is lower than for red meats. Although not rigorously tested, conventional wisdom holds that fat in the diet is undesirable (it certainly has implications for cleaning and hygiene) and that carbohydrate and protein of vegetable origin is inefficiently used, unless precooked to break down cell walls. The latter assumptions are now under close scrutiny, because artificial

rations with carbohydrate and vegetable protein, which are much cheaper than animal protein, are now working well with American alligators, although recent trials indicate better performance with increasing quantities of animal protein (versus vegetable protein).

A typical juvenile crocodilian will consume about 15-20% of its body weight in food every week at a constant temperature of 30°C-32°C. However, in outdoor pens food consumption will vary greatly depending on ambient conditions and season. Overfeeding, especially with fatty foods, can result in excessive fat deposition and gout, especially if temperature is not adequately controlled. Crocodilians can go long periods without food, especially at low temperatures, but they can also turn to cannibalism if adequate food is not provided and especially if the animals are not graded on the basis of size.

The most common deficiencies are those associated with calcium, Vitamin A and, in fish fed animals, Vitamin E/selenium. Calcium is usually added at 1-2% by weight in a palatable form such as bone-meal. A standard vitamin supplement is widely used, but even in this, Vitamin A is readily oxidized and degraded. Vitamin supplements should therefore be fresh and kept in a cool place.

Presentation is important. Hatchlings obviously cannot manipulate and swallow large particles of food, and thus they are usually fed ground, minced or chopped food. "Chunks" of food seem to be preferred, but cubing is labour intensive, and grinding/mincing is far more common. It also allows the efficient mixing of supplements. Although nocturnal feeders in the wild, crocodilians in captivity can be trained to eat at any time. Most farmers feed at night and leave the animals in the polluted water all night; they clean the next morning. However, there appears to be interspecific differences in the degree to which they pollute the water. For example Estuarine Crocodiles usually retreat into the water to feed, where ground/minced and artificial food breaks up easily and is lost. Australian Freshwater Crocodiles, on the other hand, tend to consume more of their food on the land surface. With Nile Crocodiles it is recommended to feed in the morning, so that the food can be left for about two hours before the enclosures are cleaned and fresh water added. Where they are housed in shallow, warm water (without land), the water is drained before feeding, although this approach is also used in some farms with land. Such a strategy maximizes the amount of food eaten (it is not lost in the water), but the food must be well spread out to avoid stressful scuffles, piling and injury. In colder climates the draining of water for a few hours can adversely affect the temperature of the pens, negatively impacting on both feeding and growth.

Feeding rate has not been well studied, but animals must be fed at regular, close intervals to maintain their maximum rate of digestion and assimilation. The duration of these intervals changes as an animal grows so that hatchlings are best fed once a day, but juveniles of 1.2m every second day. Occasionally hatchlings are fed several times daily, and grow significantly better. However, the amount of food they eat rises out of proportion to the additional growth: under these conditions a 10% reduction in food may result in only a very small decrease in growth rate. Similarly, more regular feeding of large animals leads to an increased metabolic load such that both food conversion and growth actually decline.

### 4.3.2 Growth rates, survival and age to slaughter

The economic success of a farm depends on survival rates and age at slaughter, which is a function of both growth rate and market factors. As noted above, both survival and growth rate are dependent on temperature and the way it affects the development of embryos and the metabolic rate of juveniles (and perhaps embryos). Crocodilians of all species will grow and survive well in a commercial farming situation if they are given a good start through incubation and are well fed and maintained in a stress-free environment with temperatures in the range 30°C-32°C.

**Survival.** Good data on survival are available from a number of crocodilian farming regions in the world. These can be analyzed to show levels of mortality in eggs during incubation, in hatchlings during their first year and in rearing stock: the three most natural divisions in the husbandry process.

Measures of incubation success are intimately linked to the quality of eggs, and the degree to which non-viable eggs are detected and identified. With wild collected eggs, if all dead eggs are examined to determine whether an embryo death occurred before or after collection, it is possible to assess precisely the incubation efficiency; it is possible to hatch 90-95% of viable eggs (eggs containing live embryos at the time incubation starts). It is also possible to identify clutches in which progressive mortality relates to conditions that occurred prior to collection. It must be remembered that in some areas wild eggs may also be compromised and there may be low percentages of viable eggs. With Nile Crocodiles in Zimbabwe, 5-10% of eggs collected from the wild are usually discarded, and overall hatching success is in the range of 75-90% of all eggs found. With Estuarine Crocodiles, 90-95% successful incubation of viable eggs may relate to 50-60% of all eggs found (there are high losses due to flooding and overheating). With Estuarine Crocodiles in captivity, the overall hatch rate is markedly reduced (often to as low as 30% of all eggs) and there is often a poor hatch of apparently viable eggs (80%). In contrast, captive Common Caimans have a fertility rate of about 75% and of these, an average of 92% hatch after efficient incubation.

Severely deformed embryos, together with those which hatched but died soon after, are usually counted as incubation failures, although "hatched normal" and "hatched abnormal" can be used as separate criteria.

Hatchling mortality (up to one year of age) is typically maintained at 5% or less on farms which provide good control over the hatchling environment, with most species. There is typically an increase in mortality after a month or two, when runt animals succumb, then the mortality rate declines. However, many farms experience losses of between 50% and 100%, invariably due to a failing in environmental management - especially inadequate temperature control (too cool). However, even with good artificial environments severe mortality (10-25%) can occur from stress-related disease (Section 4.4). The cause of stress may be obvious (a response to disturbance or a change in routine) or subtle (such as nutritional deficiency).

Once crocodilians have reached about 0.7m total length, which is often at 9-12 months, they are hardy and tolerate more variation in the management regime. Deaths after one year should be uncommon (0-2%) and, again, are usually stress-related.

**Growth and age to slaughter.** In a farming situation, growth (which is best defined as the synthesis of protein into body material) is commonly measured as total length. This is probably better than a measure of weight since animals fed high fat diets may put on weight without actually growing. Thus although weight is used to calculate food conversion, the results need to be interpreted cautiously. Growth rate is limited by the amount of energy available, which is a function of the crocodilian's metabolic rate. This in turn is determined by physical and biochemical constraints - the design of the animal - and it appears that for most crocodilians there is a maximum theoretical rate of growth of 4mm per day. Even the most successful farmers have been unable to achieve this growth, but some get close with a very small number of fast-growing animals. With American Alligators 2.5-3.0mm per day gets animals to the 1.2m size in a year. As a general observation, the best growth rates are often attained by farmers with a few hundred animals, rather than those trying to raise thousands.

With the larger species of crocodilians, an efficient farmer can expect to grow a significant portion (30-40%) of his animals to 0.9-1.0m in 12 months and 1.3-1.4m in 18 months. Some animals do much better, but the majority only reach 1.5m in 24 months, or more. With Common Caimans, similar growth rates are achieved but the economics of marketing the skins means that few if any farmers extend commercial raising longer than 18 months.

The age at which stock is slaughtered depends on a multitude of factors such as growth rate, but also market forces and the cost and availability of vital inputs. For example, a farm with access to few eggs but abundant cheap food, heating and space may opt to grow animals which are much larger than would be considered economic by a farmer who has a good supply of eggs, but limited or expensive food or space. However, in every main producing region farmers generally slaughter animals of 1.2-1.5m or less. Beyond this size, the cost of production increases dramatically; very few farmers find it feasible to produce animals as large as 1.8-2.0m. The main consumers of raw skin (Section 6) require some animals over 1.8m to ensure that the full market is satisfied, but the present price structures do not provide the necessary incentives for farm production in this range. Clearly, with good stock control inefficient or non-productive breeding stock can be recognized and used to satisfy some of this demand.

Finally, when deciding upon size at slaughter, crocodilian farmers must research any legal restrictions on size limits which may apply. Some countries have a maximum size limit on skins that can be exported, regardless of whether the skin originates from the wild or from a farm.

### 4.4. Disease

Crocodilians, like all animals, are subject to a variety of clinical disorders. Outbreaks of disease can cause high mortality, poor growth or a reduction in hide and meat quality, all of which can have a disastrous economic impact on a farming operation. It is a common and serious misconception that a disease problem is resolved simply by treatment with medications. Outbreaks of disease in crocodilians are almost always indicative of management errors that must be corrected if the disease is to be truly controlled. A thorough analysis of a disease problem has to look at what the disease is, when and where it

originated, why it became a problem, which animals are affected, and how they were infected.

### 4.4.1. Disease and its prevention.

Viruses, chlamydia (virus-like agents), bacteria, protozoa, fungi and helminth worms have all been isolated from crocodilians, and some of these infective agents are of great clinical significance in farming operations. Nutritional deficiencies, or occasionally excesses, may also cause disease.

The organ systems of the animal affected by disease may also be significant. For example, diseases affecting the skin can reduce the quality and value of the hide. Pox virus causes erosions of the skin and may additionally be associated with high hatchling mortality. A variety of bacterial and fungal organisms can also invade the skin, as can filarial nematodes which produce characteristic zigzag marking of the belly scales. Diseases of the liver and gastrointestinal system can cause massive mortality, or in less severe cases result in poor growth rates. Generalized bacterial infection (septicaemia) by agents such as *Aeromonas*, *Salmonella* and *Edwardsiella* can also cause sudden death while pentastomes (a parasitic, worm-like arthropod) and bacteria can affect the respiratory system.

Identification of the specific disease-causing agent will usually require professional assistance. Farmers should become familiar with appropriate veterinarians, pathologists or researchers well before any crisis occurs.

Most crocodiles carry bacteria, and possibly other pathogens, which have the potential to cause disease under the right conditions. Another common source of infectious disease is via the introduction of new animals to an established farm population. Management should include facilities for quarantine and isolation of crocodilians from outside sources. Contaminated feed may also introduce disease to a farm. For example, poultry may be a source of *Salmonella*, and certain fish are intermediate hosts for nematode and pentastomid parasites. Water source and quality may also be critical, especially with hatchlings. Water taken from sources with resident wild crocodilians is considered by some to be a dangerous source of pathogens, some specific to crocodilians. Where there is any doubt about water quality, it should be purified.

Wild crocodilians appear to be hardy animals, relatively free of disease ("sick" animals are encountered rarely), which suggests that they have a particularly effective immune system (although this aspect of wild crocodilians has received little research attention - dead and diseased wild crocodilians may disappear rapidly). However, when they are raised in captivity, it involves a totally unnatural environment, which in turn appears to affect both stress levels and the immune system: for example, increased population densities, altered environmental temperatures, different water and feed qualities, a variety of stress factors and general cleanliness. Deviations from the optimum environmental conditions, and even deviations in cleaning routines or other management procedures, can result in stress, which usually weakens animals, causing reduced appetites and decreased resistance to disease. Evaluation and correction of improper environmental conditions is an essential component of disease control. Disease is also more likely with an unbalanced diet and/or in animals which have experienced suboptimal incubation.

Controlling the spread of infectious disease requires the identification, isolation and rapid treatment of all exposed animals. Rearing facilities with numerous small enclosures are therefore preferred over those with large pens. Disease is most prevalent amongst hatchlings and particular attention should be paid to all aspects of the management of this age group.

The warm, wet crocodilian rearing environment is ideal for the spread of pathogenic organisms. Once they are introduced, diseases may be spread if contaminated water as well as feed, equipment or footwear moves directly from one pen to another, or by the transfer of animals between enclosures. For proper disease control, facilities should be designed so that groups of animals form strictly isolated populations. Improper facilities in which water flows from pen to pen or where personnel walk directly from pen to pen invite epidemics. Hygiene is critical. With Nile Crocodiles it is recommended that pens be cleaned and rinsed after each feeding and that they be scrubbed with disinfectant at least once a week - once a day if food is particularly fatty. With American Alligators and Estuarine Crocodiles the water is usually changed after each feed but scrubbing with disinfectant is far less frequent. With Common Caimans and most species, stringent hygiene tends to be applied to young hatchlings, but has been found to be less important once animals are established and growing.

### 4.4.2. Treatment

Many of the diseases of crocodilians can be treated with modern antibiotics, antifungal medications and parasiticides that are used for domestic poultry and livestock. Other diseases, especially viral diseases, cannot easily be treated and further research is needed, especially in the development of vaccines. Some treatments may be administered in the water or in the feed. It is important to realize, however, that many other treatments must be administered to each animal individually, often for several days, and that the farm design must allow that this be accomplished efficiently. The specific treatments of choice will change with the development of new drugs and medications, and farm management should keep informed of current veterinarian practices. The best treatment is clearly prevention.

## 5. Slaughter and processing

The production of hide, meat and curios has become the central goal of crocodilian farms, even though many cater to tourism. The following section deals with the end products of commercial farming.

### 5.1 Humane slaughter

There is international expectation that humane methods will always be used to slaughter crocodilians. These methods should give instant brain death, or at the very least immediate and complete unconsciousness of a crocodilian with the minimum of excitement and discomfort. Both chemical and mechanical methods are available, but the use of lethal drugs is uncommon because they are expensive and may render the meat unfit for human consumption.

Mechanical stunning instruments, traditionally used in livestock slaughter, are not often used with crocodilians. The penetrating captive bolt and concussion mushroom are cumbersome and difficult to use without damage to the jaw skin. Of the two main mechanical methods

which are used, shooting is capable of causing the minimum of disturbance and stress both to the individual and its colleagues. Usually a .22 short calibre, silenced rifle is used point-blank to destroy the brain from behind while the animal is still in its rearing enclosure. In some circumstances other crocodiles do not appear to notice that any management activity is taking place. A flat trajectory with entry at the post-occipital junction with the spinal column ensures that the skin below the jaw is not damaged and the skulls of such animals are still intact and of value as curios. In all cases the spinal cord should be severed once an animal is removed from the enclosure. The main disadvantage of this method is that some contamination of neck and jowl meat may occur from bone splinters. It may also be of limited use in countries where firearms are prohibited.

The other mechanical method commonly used, the "nape-stab", involves the physical restraint of the crocodilian and usually its removal from the rearing enclosure. Wet, heavy material is placed over the animal's eyes and its head lowered in a downward position to extend the neck vertebrae. A sharp chisel-like implement is then quickly forced between the base of the skull and the first spinal vertebrae, severing the spinal cord. It is then essential that a rod of about 3mm diameter (ideally stainless steel) be used to probe and totally destroy the brain (pithing), and it is an advantage to skinning (prevents local reflex actions) if the spinal column is destroyed similarly.

### 5.2 Skin management

Although meat sales are increasingly important to some crocodilian farmers, the product of principal value remains the animal's hide for the exotic leather trade. Even a small skin of 17cm belly width, destined for watch-strap manufacture, has a value higher than the hide of any traditional livestock animal. Care of the skin is therefore of paramount importance and some commonly used techniques, from skinning to transport, are described here.

**Skinning**. The majority of classic skins in trade present the belly whole, with high dorsal cut lines. An alternative, the horn-back, is produced by opening the skin at the belly. With both, the position and accuracy of the opening cut lines is critical. In some countries, sections of the opening cut lines are changed from time to time for law enforcement purposes.

Techniques of flaying vary from place to place and it is always best for new producers to learn the cut lines and other flaying techniques from an experienced skinner. However, there are some features of general importance. Only as many animals as the skinners can comfortably handle in three hours should ever be killed (where meat is to be produced this requirement will be even more restrictive). From killing onwards, every care must be taken to ensure that the skin is not mechanically damaged or contaminated with dirt or blood. The carcass should be bled in a cool, shaded place and washed before flaying. All flesh and fat must be removed by scraping, and sometimes with high pressure water jets, and the skin should be cured as quickly as possible.

One experienced person can flay an animal of 1.2m in about 15 minutes, and comfortably complete 20 in a day. Thus, skinning an annual crop of 3000 skins will require roughly 150 man-days.

**Curing.** Until skins are chemically turned into leather they are subject to microbial deterioration. To preserve them prior to tanning, they are cured by dehydration which is best achieved through saturation with salt. Moist salt is either applied directly to the skin in a salt stack or the skins are soaked in super-saturated brine solution.

When applied to the flesh surface of the skin, salt removes water and also dissolves and enters the tissue where it additionally retards bacterial growth. Skins kept in brine are well preserved, stay more pliable and may shrink less. However, damage occurs to all the skins if the salt is used up without the farmer noticing, and in any case they have to be drained and salted before packing and shipment. To build a salt stack, medium-grained moist salt, equivalent to about three times the weight of the skin, is rubbed into its flesh side. After about 48 h the small skins are well dehydrated and have stopped shrinking. They are then re-salted with a thin layer of fresh salt.

**Tagging and grading.** Soon, all crocodilian skins in trade will have to be tagged in terms of CITES regulations (see Section 1). These tags are the responsibility of the CITES Management Authority, but are commonly held and applied by farmers or farmers' associations. Tags for CITES purposes must be self locking and bear information on the country of origin, year of skinning and a unique serial number. They are usually applied to the tail and are generally left on during tanning.

Although practices are variable, and in some places governed by specific regulations, it is most convenient to tag skins before they are finally measured and graded so that measurements, grade and number can be recorded together in a packing list. However, skins are usually sold in distinct size classes and it is often necessary broadly to separate these before tagging and the final measuring exercise.

Grading standards vary, but in general classic skins have an area of prime importance known as the "pattern" and skins with a hole or serious scars or lesions in the pattern are down-graded to second quality with a 25% loss in value. More serious damage may lead to the third grade which loses a further 25% in value. In some countries skins have traditionally been measured by length, but since they are sold after tanning by belly width most farmers now prefer to sell their skins in the same way. They are measured across belly at a point approximately one-third of the way down the hide between the inside edges of two prominent bony scutes.

**Packing and storage.** Skins must be packed in such a way that they can be stored and transported to tanneries without deterioration.

The best method of packing small, wet salted skins is to roll them tightly, starting from the head to the tail. The legs should be folded inward along the natural line of the body (there must be plenty of salt in the folded area). The tail, being outermost, protects the valuable pattern and allows the CITES tags or other identification marks to stay exposed. With large skins the side of the belly skin should also be folded in and the whole rolled skin held in place with twine or a rubber band. The rolled skins are then placed in clean, moist hessian sacks. These in turn may be stacked inside small wood or waterproofed crates.

Untanned skins should never be stored for long periods irrespective of the quality of curing. Well cured skins can be stored in the shade in salt stacks for several weeks provided they are kept moist, but chilling at 2-5°C in a cold room is preferable. Sacks of rolled skins kept at these temperatures must again be kept moist to prevent dehydration.

**Transportation.** Given the relatively high value to weight ratio of crocodile skins, international transportation is best by air. The consignee and consignor's details are stencilled on the side of the boxes with details of the storage required. Insurance cover is essential. Full documentation, including detailed packing lists and CITES documentation, should accompany each shipment.

### 5.3. Meat and by-products

The processing of crocodilian meat for human consumption almost always involves the farmer in strictly regulated abattoir management and additional responsibilities relating to packaging, labelling, shipping, and record keeping. Abattoirs must be constructed and operated according to health guidelines laid down either within the country of production or, when export is planned, the proposed importing country. The regulations and requirements are usually particularly onerous where the meat is to be exported. Abattoir facilities are always costly to build, maintain and operate. The difficulty and expense involved in meeting the requirements of hygienic meat production, together with considerations of marketing, have prompted many producers to pool their resources into regional or group facilities to reduce costs and achieve a more dependable flow of meat products.

Approximate meat yields from a farmed crocodilian are as follows:

| Live length (m) | Bone in weight (kg) | Fillet weight (kg) |
|---|---|---|
| 0.9-1.2 | 0.8-3.0 | 0.4-1.5 |
| 1.2-1.4 | 2.7-6.8 | 1.4-3.4 |
| 1.4-1.5 | 4.5-11.0 | 2.3-5.5 |

By-products are important in some farming areas and are conveniently considered in two categories: curios/novelty items and ingredients for medicines and other products.

Novelty items such as heads, feet, teeth and claws and back-strips are commonly retailed as curios by farms which entertain tourists, but are usually sold in bulk by the farmer in the first place since the process of turning these items into a marketable form is involved and best handled by another party. Raw ingredients such as glands, bile and fat are used in medical research or as ingredients in other products. Those items which are to be used for medical research must usually be prepared in at least the same environment as that used for meat processing.

## 6. Marketing of products

Meat is the most important by-product and can add significant value to the total return on the hide. For example, in 1991 when skin values declined, meat contributed 35-40% of the total value of small (1.2m), farm-raised American alligators. Other by-products like skulls and teeth, which provide occasional opportunities for sales, are not generally consistent income earners. There may also be opportunities for farms to sell live animals to other farms as rearing or breeding stock.

Prices vary widely on all farm products. Factors of importance are the species involved, the size and quality of hides, the proximity to developed wholesale meat markets, annual production of eggs and hatchlings from ranching or captive production and competitive demand for rearing or breeding stock. However, by far the most important factor is the demand for skins, which is fickle and poorly understood.

### 6.1 Skins/Leather

Although crocodilian leather has been used in various parts of the world for generations, it was during the period 1945-1960 that trade in crocodilian skins reached its peak. Over three million wild-taken skins were marketed each year. Then, as today, this trade was divided into two broad categories: low value, high volume caiman skins and high value, low volume classic skins.

South American caimans have always provided the bulk of crocodilian skins in trade. Caimans have a strongly ossified belly skin and traditionally only the soft sides, or flanks, entered trade. These have been used to produce belts, shoes and other less valuable items. During the 1950s and 1960s eight million skins of all sizes, including flanks, may have been traded annually. By 1984 this had been reduced to less than one million. Today, an increasing number of caiman farms are using captive breeding and ranching to produce the skins of small caimans, destined for the less expensive more popular finished products. Some of these farms are designed to raise large numbers of animals (50,000 plus), which may well be essential for commercial viability.

Until recently, farming was generally restricted to classic species - crocodilians whose belly skins had minor or no ossification. The whole belly skin of these animals can be used to produce high quality (and value) leather goods, but even within the classics there is a hierarchy of value. Traditionally, the trade favours the Estuarine Crocodile ("Singapore small-scale"), paying a 20% premium over the Nile Crocodile, commonly known as "Croco Afrique", which in turn is valued 10-20% higher than the American Alligator and the New Guinea Freshwater Crocodile. Today, more than 90% of all the classic crocodilian hides produced are from Australia, Indonesia, Papua New Guinea, USA and Zimbabwe.

It is believed that the level of trade in classics in the 1950s and 1960s may have reached 500,000 skins per annum, but later estimates suggest that this had decreased to 300,000 by the early 1970s and to 150,000 by 1984. It was still about 150,000 skins in 1989, though the composition of the trade was changing dramatically. Wild-taken skins were declining, whereas farm-raised skins were increasing by about 50,000 per annum. As wild skins have been taken out of trade because of conservation programmes, farming has prospered. To

some extent this has been self perpetuating, since the increased legal supply has stimulated the trade and encouraged a resurgence of fashion based on crocodilian leather.

A very important factor affecting the resurgence in classic crocodilian skin production has been the number of specialist tanners, which has declined markedly since 1970. There are now only about 12 tanneries, in Europe, Japan and the USA, which can produce high quality crocodile leather. Of these, a few French and Italian tanners dominate by virtue of both capacity and quality - they handle 80% of the world's produce. Not surprisingly, tanners are in a strong position and those in Europe themselves trade in raw and finished skins. Producers of any significant size usually sell to them direct. Japanese tanners do not buy skins, but rely on Japanese trading houses to bring in business through contract tanning. Finished leather is sold to high-class manufacturers, and again these are principally European. Ultimately, the whole business depends on fashion and while the increased production of classics has stimulated the fashion industry to revive and promote crocodilian products, an oversupply of farm skins has resulted.

Farm-raised hides are generally harvested and marketed after rearing 1-3 years, depending on the farmer's facilities, operating capital and marketing strategy (see Section 4.3). Generally, skins from 1-3 year-old rearing stock from controlled environments will have belly widths between 15 and 45cm, and they will be sold in size groups of 15-24cm, 25-29cm, 30-34cm, 35-39cm and 40cm+. Smaller skins are generally used for small leather goods like wallets, watchbands and shoes. Mid-range sizes are primarily used for handbags and belts, while larger sizes are traditionally used for boots, briefcases and luggage. Price increases of 10-15% between size classes are common and, since most farm hides are small, there is generally a more substantial increase in price for skins over 40cm.

Crocodilian hides are normally offered for sale on the basis of negotiated or bid prices either by individual farmers or through farms marketing cooperatively. A standard method of measuring and grading hides is generally used to ensure a fair market price between buyer and seller.

There is increasing support through international cooperation of producing countries, trade groups and individual companies to promote farmed crocodilian leather. Retailers and customers are informed that farmed crocodilian skins are not illegal. To complement this approach, the farming of crocodilians is strictly regulated to ensure that conservation advantages accrue.

### 6.2 Meat

The most developed market for meat is in the USA, where alligator is usually marketed directly to restaurants or through seafood distributors. Tail and body meat, which is considered the best quality, is usually sold separately from leg meat. Meat is often cubed (tenderized) and sold frozen in 2.3kg (5lb) seafood cartons. Markets for ribs or ground meat also exist, but are not as well developed.

In all parts of the world, most meat ends up in restaurants, often offered as an appetizer or entrée either fried or sauteed, though many recipes for veal or chicken adapt well to

crocodilian meat. Cookbooks and promotional brochures with recipes and tips on handling and preparing meat are commonly published as marketing and promotional tools.

## 7. Economics

The commercial viability of crocodilian farming depends on many factors, especially the species farmed, market trends and management. A crocodilian farm which does not include tourist facilities, will usually have a lag time of at least three years before income is received. If the farm is based on captive breeding, and juvenile stock have been purchased to be grown out to breeders, then this lag time will be appreciably greater. The most successful farms commercially are commonly those with a significant number of paying visitors or those which are integrated with some other income generating business.

Prospective crocodilian farmers are advised to prepare a detailed and realistic business plan for the venture, and seek professional advice at an early stage. This section examines the most important factors upon which economic success and failure are usually based.

### 7.1 Sources of revenue

The purpose of a crocodilian farm is to generate sufficient income from hides and other crocodilian products to make a profitable return on the investment. Farm income is commonly derived from a combination of live sales, skins, meat, other by-products and tourism.

Skins are the major product (Section 6). It is usually possible to plan stock numbers and output reasonably precisely, and with knowledge of the particular species' value, realistic projections of the major source of income are usually possible. Crocodilian meat, skulls, back straps, teeth, feet and internal organs all have a value, but it typically contributes in only a minor way to total income.

Farms generate interest in crocodilians and their conservation and, in the right location, tourism can make a very significant contribution to farm income. A word of caution - developing the farm to accommodate visitors will incur significant additional expenses and will have a cost in terms of animal stress and production. It is therefore recommended to open only part of a farm to visitors.

### 7.2 Key cost factors

Economic analyses spanning a range of circumstances identify a number of key cost factors: effects of location; capital outlay; stock supply and costs; food supply and cost; labour; and heating costs.

The importance of location cannot be overstressed. In general, the farm should be established where food supplies, power, water and other services are readily available, and crocodilians should be moved to the farm, and not vice-versa. Supplies and services may not seem important initially, but as the farm develops so do its service requirements. A remote location is to be avoided. However, crocodile farms situated too close to urban

centres may face a different set of problems including security, expensive land, and problems of effluent disposal.

The capital outlay in setting up a crocodilian farm varies greatly from place to place. In some developing countries building materials and costs are low, while vehicles and freezer equipment are imported at high cost. Farms which are added to an existing infrastructure avoid the costs of land and its development. Capital expenditure is not usually the factor which determines a farm's success or failure in a developing country, though it often does in the developed world.

Amongst recurrent costs, the most significant are usually stock, food and labour, though remote farms may suffer inordinately high transport and power costs. Stock costs may be very low or very high depending on demand and on whether the farmer has to buy in a competitive situation. Generally, the cost of a hatchling is less than 30% of the value of the skin of a one-year-old. Food and management/labour tend to be more significant overheads. The most successful farms have inexpensive, even free food. On many others food is the pivotal factor in profitability. Labour is not usually expensive in developing countries, but the cost of management commonly makes up for this. Elsewhere, farms are mechanized and organized to run with minimum staff - though skinning expertise is impossible to avoid. In cool climates, heating can be a major expense.

It appears to be every farmer's experience that:

i) it takes longer than planned to establish a farm;
ii) it costs more than planned to establish a farm;
iii) returns are lower than planned.

Despite the above words of caution, crocodile farming does have the potential to be a viable and rewarding enterprise.

## Glossary of terms

**Albumen.** The clear mucus-like substance surrounding the yolk in bird and reptile eggs - the egg "white".

**Alligator.** The American Alligator, *Alligator mississippiensis*.

**Appendix I.** A schedule of species in CITES which are threatened with extinction, and are generally banned from commercial international trade, unless bred in captivity.

**Appendix II.** A schedule of species in CITES which may become threatened with extinction unless international trade is regulated. Export permits must be obtained before international trade may take place. All crocodilians which are not in Appendix I are in Appendix II.

**Behaviourial fever.** If "sick", crocodilians may increase their body temperature above normal levels by basking for longer periods.

**Bred in captivity.** Defined in CITES Resolution Conf. 2.12 as "born or otherwise produced in a controlled environment, ... of parents that mated ... in a controlled environment". For crocodilians, this means offspring that hatched from eggs laid in captivity.

**Candling.** Where a strong light is applied to the surface of an egg in a darkened area, some details of the inside of the egg can be seen. It is very important that a strong light be used, but care needs to be exercised so that egg temperature does not increase above critical levels.

**Caiman.** South American members of the subfamily Alligatorinae (six species in three genera). Sometimes used only to refer specifically to members of the genus *Caiman*.

**Captive-breeding.** Producing captive-bred offspring (see "bred in captivity"). To qualify for exemption from the CITES ban on commercial trade in Appendix I species, a captive-breeding operation must be managed in a manner designed to maintain the breeding stock indefinitely and which has been demonstrated to be capable of reliably producing F2 generation offspring.

**CITES.** "Convention on International Trade in Endangered Species of Wild Fauna and Flora", concluded in Washington in 1973.

**Classic skin.** Crocodilian skin with unossified or poorly ossified belly scales. These skins command the highest price, and generally come from the genera *Crocodylus* and *Alligator*. The principal classics in trade are the Estuarine or Saltwater Crocodile, the Nile Crocodile, the American Alligator and the New Guinea Freshwater Crocodile.

**Common Caiman.** *Caiman crocodilus crocodilus* and/or *C. c. fuscus*, which are found in Central and South America.

**Controlled environment.** An environment intensively manipulated by man, and designed to prevent animals entering or leaving.

**Crocodilian.** Members of the Order Crocodylia, comprising all members of the subfamilies Alligatorinae, Crocodilinae and Gavialinae.

**Estuarine Crocodile.** Also known as the Saltwater Crocodile, *Crocodylus porosus*.

**F1 generation.** The first generation bred in captivity: i.e. the offspring of parents collected from the wild.

**F2 generation.** The second generation bred in captivity: i.e. the offspring of parents bred in captivity (F1 generation).

**Farming.** This term is not defined by CITES, but is often taken to refer to any operation raising (wild) animals in captivity. It thus includes both captive-breeding and ranching operations.

**Hatchling.** Usually refers to a crocodilian in its first year of life.

**Management Authority.** The government authority designated within each country as being responsible for administering CITES, including the issuance of export permits.

**Metabolic rate.** The rate of metabolism as determined by the amount of food consumed, heat produced or oxygen utilized.

**Metabolism.** The chemical or energy changes which occur within a living organism or a part of it which are involved in various life activities.

**Mugger.** A crocodile found in India, *Crocodylus palustris*.

**Neonatal.** Newly born or recently hatched.

**New Guinea Freshwater Crocodile.** A crocodile of Papua New Guinea and Irian Jaya, *Crocodylus novaeguineae*, which appears to include two distinct races.

**Nile Crocodile.** A crocodile found in Africa, *Crocodylus niloticus*.

**Post-occipital.** Behind the head. Post-occipital scutes refer to a row of enlarged scales immediately behind the head.

**Quota system.** Export quota system drawn up by CITES in 1985 under which species listed in Appendix I can be transferred to Appendix II subject to export quotas, controlled by CITES Resolutions Conf. 5.21 and 7.14.

**Ranching.** Ranching crocodilians involves collecting eggs or hatchlings from the wild and rearing them until they are large enough to sell. Defined in CITES Resolution Conf. 3.15 as "the rearing in a controlled environment of specimens taken from the wild". Under the terms of this Resolution populations of species listed in Appendix I can be transferred to Appendix II, subject to strict regulations.

**Sustainable utilization.** A level and frequency of harvest of a population that can be compensated for by the population and can thus continue indefinitely.

**Thermoregulation.** The regulation of body temperature. In crocodilians and all other reptiles this is achieved by behaviourial means: e.g. basking in the sun, seeking shade or cool water.

**Further Reading**

There is a vast literature on crocodilians, which covers various aspects of their biology, conservation, management and farming. Some early publications have been superseded by new information, although others have not.

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# PART 2

# DIRECTORY OF CROCODILIAN FARMING OPERATIONS

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## Introduction

### Definitions

Crocodile farming may be defined as the rearing of crocodilians in captivity for commercial production of skins, meat or live animal sales. It therefore does not include zoos, which keep crocodilians for public display, although many commercial crocodile farms display their animals to paying visitors and may even derive most of their income from this source. Farms usually rely on a small number of species for commercial production (generally fewer than three) but regularly keep additional species for display purposes. Thus the distinction between zoos and farms may be difficult to draw in the early stages of operation. Crocodilians may also be bred in captivity as a conservation measure in order to build up the numbers of a severely depleted species for their eventual reintroduction. Some may experience such success with captive breeding that all possible sites for reintroduction become fully stocked, whereupon they may eventually need to sell off surplus production. Breeding may also be carried out for research purposes and this may have the eventual aim of developing technology for commercial farming.

Farming may be further subdivided into captive breeding and ranching. These are defined in strict terms in Part 1 of this volume. Captive breeding is relatively self-explanatory and involves keeping a breeding stock of adults on the farm for the production of offspring which are raised for commercial production. In ranching, the production stock are captured from the wild and reared in captivity for a portion of their lives. In some countries, such as Papua New Guinea, stock are usually captured as hatchlings but, more often, eggs are collected from nests made in the wild and the young are then hatched in incubators. Many farms combine different methods of production, producing some offspring from captive stock and others from wild sources. This can have implications for the trade of the products in that different CITES controls may apply.

### Methods for survey

The first edition of the *Directory of crocodilian farming operations* was used as the basis for this survey. Questionnaires were sent to all of the farms listed and an attempt was made to locate additional farms through correspondence with government authorities and members of the IUCN/SSC Crocodile Specialist Group. In most cases, the information given in this directory derives from the questionnaire responses, although additional information was sometimes received from other sources. The sources are all listed below each entry. Where conflicting information was received, this is usually noted. For countries with large numbers of farms and relatively complete and accessible official records, these were used in preference to questionnaire survey. Draft copies of the data compiled were circulated to CITES Management Authorities and members of the IUCN/SSC Crocodile Specialist Group for comments. Although this process has highlighted data which may be inaccurate, no further measures were taken to verify the data and they should be used for guidance only.

The primary survey was carried out during 1990 and 1991 and the initial questionnaires requested data for the year 1989. Subsequently, more recent data have been collected and these have been included. All of the data collected were stored in a database in a standard

format but the lack of standardisation of the data available has necessitated the use of text descriptions and may have resulted in some simplification of the data. The inclusion of a "-" in the data tables has been used interchangeably to represent zero or data unavailable. Data are presented in the following form:

**Name of Farm**

*Address of farm location, but office address if this is not available.*

Manager: *Name of manager, owner or questionnaire respondent*
Date of Establishment: *Actual or approximate date of establishment - 01/01/75 indicates sometime during 1975*
Date of Census: *Relates to the date on which the "Stock on farm" census was taken*
Total Area: *Total area plus summary of ponds available*

Food: *Summary of food type and source*

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *List of species kept on farm* | *< 1 year* | *Sub-adults > 1 year* | *Breeding Stock* | | |

| Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|
| *Species (Relates to those in stock list)* | *Year in which activity first occurred* | *Summary of annual totals. Where collection or breeding season extends into two calendar years, the year shown indicates the beginning of the season* | | | |

Captive breeding *Number of hatchlings produced from eggs laid on farm*

Eggs collected *Number of eggs collected from the wild for incubation on farm*

Hatchlings collected *Number of hatchlings collected from wild for rearing on farm*

Skins produced *Number of skins produced on farm and sold*

Source of Information: *Questionnaire, or other sources listed in reference list*

The directory is sub-divided into countries with an introductory section for each summarizing the laws in force relating to crocodilians. Where legislation was not provided by the countries concerned, information was taken from de Klemm and Navid (1989), Nichols *et al.* (1991), Fuller *et al.* (1985) and IUCN (undated). Country sections have been included for all countries with commercial crocodile farms and all countries with wild populations of crocodilians.

## Results

The total number of farms recorded in the directory is shown in Table 1. There are at least 597 commercial farms and a further 75 of an experimental or non-commercial nature. The total stock is in excess of 1.1 million, giving an average of 1700 crocodilians per farm. The largest farm is Mainland Holdings in Papua New Guinea with a total of 27,288 crocodiles. Annual skin production from the most recent data available (1989, 1990 or 1991, depending on the farm) is in excess of 182,000. The majority of the stock derives from the removal of eggs or hatchlings from the wild while some 193,078 hatchlings a year are produced from captive-breeding operations.

The species kept are shown in Table 2. *Alligator mississippiensis* is the most numerous, followed by *Caiman crocodilus*, *Crocodylus niloticus*, *C. novaeguineae* and *C. porosus*. The principal countries for farming are the USA, Colombia, Zimbabwe and Indonesia (Table 1).

Table 1. Estimates of the number of commercial and non-commercial farms, total crocodilian stock, skin production, intake of eggs and hatchlings from the wild, and captive breeding on the farms.

| Countries | Commercial | Non commercial | Total stock | Current skin production | Eggs/juven from wild | Farm-bred hatchlings |
|---|---|---|---|---|---|---|
| Argentina | - | 2 | 153 | - | 372 | 108 |
| Australia | 13 | - | 42,421 | 3,566 | 13,555 | 4,854 |
| Botswana | 3 | - | 7,921 | 6,00 | 4,937 | 1,917 |
| Brazil | 18 | - | 3,188 | 7 | 1,876 | - |
| Cambodia | 1+ | - | 70+ | - | - | 1,700 |
| China | - | 2 | 3,795 | - | - | 675 |
| Colombia [1] | 64 | - | 133,625 | 54,452 | 330 | 86,128 |
| Cuba | 5 | - | 11,099 | 500 | 650 | 7,349 |
| Ethiopia [1] | 1 | - | 8,554 | 2,089 | 7,140 | - |
| France | 1 | - | 300 | - | - | |
| Gabon | - | 1 | 17 | - | - | - |
| Guatemala | - | 2 | 185 | - | 10 | - |
| Guyana | 1 | - | 2,086 | - | 521 | 168 |
| Honduras | 3 | - | 2,558 | - | - | 1,175 |
| India | - | 40 | 21,000 | - | - | + |
| Indonesia [2] | 36 | - | 94,207 | 5,552 | 33,002 | 652 |
| Israel | 3 | - | 3,003 | 800 | - | 500 |
| Jamaica | 1 | - | - | - | - | - |
| Kenya | 2 | - | 6,272 | 1,100 | 2,530 | 2,689 |
| Madagascar | 4 | - | 1,714 | 442 | 4,832 | 954 |
| Malawi | 2 | - | 6,543 | 1,123 | 2,721 | 98 |

| Countries | Commercial | Non commercial | Total stock | Current skin production | Eggs/juven from wild | Farm-bred hatchlings |
|---|---|---|---|---|---|---|
| Malaysia | 4+ | - | 3,563+ | 295 | - | 1,846 |
| Mali | - | 1 | - | - | - | - |
| Mauritius | 1 | - | 244 | - | - | - |
| Mexico | 8 | 1 | 1,256 | - | 50 | 528 |
| Mozambique [3] | 4 | - | - | 3,000 | 1,050 | - |
| Myanmar | 1 | - | 700 | - | 104 | 149 |
| Namibia | 2 | - | 1,325 | - | - | 76 |
| Nepal | - | 1 | - | - | - | 141 |
| PNG | 6 | - | 27,301 | 5,526 | 12,503 | 1,368 |
| Palau | - | 1 | 41 | - | - | - |
| Panama | 2 | - | 300 | - | - | - |
| Pakistan | - | 2 | - | - | - | - |
| Philippines | - | 3 | 686 | - | 22 | 76 |
| Singapore | 5 | - | 11,302 | 2,864 | - | 4,199 |
| Solomon Islands | 12 | 19 | - | - | - | - |
| South Africa | 35 | - | 33,631 | 4,747 | 359 | 7,776 |
| Sudan | 1 | - | - | - | - | - |
| Taiwan | 20 | - | - | 2,000 | - | - |
| Tanzania | 6 | - | 3,893 | - | 2,630 | 300 |
| Thailand | 45 | - | 44,684 | 3,000 | - | 8,714 |
| USA | 224 | - | 489,844 | 45,469 | 325,824 | 30,089 |
| Uganda | 1 | - | 3,483 | - | - | - |
| Venezuela [4] | 17 | - | 21,974 | *28,136 | *126,492 | 5,300 |
| Viet Nam | 6+ | - | +104 | - | - | - |
| Zambia | 7 | - | 11,113 | - | 12,223 | 201 |
| Zimbabwe | 32 | - | 122,854 | 17,567 | 53,867 | 23,348 |
| Total | 597 | 75 | 1,127,009 | 182,835 | 607,600 | 193,078 |

**Notes**

\+ Insufficient data leading to an underestimate of numbers.
1 Skin production calculated as a proportion of the total skin exports 1988-1991.
2 Average annual production 1989-1991 (ICCTF, 1992).
3 No recent data. Egg collection data for 1988.
4 Authorized production of skins and egg/juvenile collection from the wild in 1991.

Table 2. Estimated numbers of crocodilians kept on farms in different countries.

| | A.mis | A.sin | C.cro | C.lat | C.acu | C.cat | C.int | C.joh | C.min | C.mor | C.nil | C.nov | C.pal | C.por | C.pxs | C.rho | C.sia | O.tet | T.sch | G.gan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Argentina | | | | 153 | | | | | | | | | | | | | | | | |
| Australia | 30 | | 4 | | | | | 17,128 | | | | | | 25,259 | | | | | | |
| Botswana | | | | | | | | | | | 7,921 | | | | | | | | | |
| Brazil | | | 3,078 | | | | | | | | 110 | | | | | | | | | |
| Cambodia | | 70 | | | | | | | | | | | | | | | | | | |
| China | | 3,795 | | | | | | | | | | | | | | | | | | |
| Colombia | | | 133,625 | | | | | | | | | | | | | | | | | |
| Cuba | | | | | 830 | | | | | | | | | | | 10,269 | | | | |
| Ethiopia | | | | | | | | | | | 8,554 | | | | | | | | | |
| France | | | | | | | | | | | 300 | | | | | | | | | |
| Gabon | | | | | | 17 | | | | | | | | | | | | | | |
| Guatemala | | | 185 | | | | | | | | | | | | | | | | | |
| Guyana | | | 2,086 | | | | | | | | | | | | | | | | | |
| Honduras | | | | | 2,558 | | | | | | | | | | | | | | | |
| India | 1 | | 239 | | | | | | | 10 | 4 | | +2,842 | +154 | | | 4 | 4 | 5 | +19 |
| Indonesia | | | | | | | | | | | | 69,834 | | 23,907 | | | 5 | | 524 | |
| Israel | 120 | | | | | | | | | | 2,883 | | | | | | | | | |
| Jamaica | | | | | | | | | | | | | | | | | | | | |
| Kenya | | | | | | | | | | | 6,272 | | | | | | | | | |
| Madagascar | | | | | | | | | | | +1,714 | | | | | | | | | |
| Malawi | | | | | | | | | | | 6,543 | | | | | | | | | |
| Malaysia | | | | | | | | | | | | | | 3,476 | | | | | 87 | |
| Mauritius | | | | | | | | | | | 244 | | | | | | | | | |
| Mexico | | | | | 131 | | | | | 1,125 | | | | | | | | | | |
| Mozambique | | | | | | | | | | | ++ | | | | | | | | | |
| Myanmar | | | | | | | | | | | | | | 700 | | | | | | |
| Namibia | | | | | | | | | | | 1,325 | | | | | | | | | |
| Nepal | | | | | | | | | | | | | | | | | | | | |

| | A.mis | A.sin | C.cro | C.lat | C.acu | C.cat | C.int | C.joh | C.min | C.mor | C.nil | C.nov | C.pal | C.por | C.pxs | C.rho | C.sia | O.tet | T.sch | G.gan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Palau | | | | | | | | | | | | | | 41 | | | | | | |
| Panama | | | 300+ | | + | | | | | | | | | | | | | | | |
| Pakistan | | | | | | | | | | | | | | | | | | | | |
| Philippines | | | | | | | | | 276 | | | | | 410 | | | | | | |
| PNG | | | | | | | | | | | | +14,036 | | +13,265 | | | | | | |
| Singapore | | | | | | | | | | | | 1310 | | 9,936 | | | | | 56 | |
| Solomon Is. | | | | | | | | | | | | | | 19 | | | | | | |
| South Africa | 15 | | 2 | | | 12 | | | | | 33,581 | | | | | | | 15 | | |
| Spain | | | | | | | | | | | | | | | | | | | | |
| Sudan | | | | | | | | | | | | | | | | | | | | |
| Taiwan | | | | | | | | | | | | | | | | | | | | |
| Tanzania | | | | | | | | | | | 3,893 | | | | | | | | | |
| Thailand | 2 | 2 | 132 | | | | | | | | 1 | 3 | | 6,852 | 3,873 | 18 | 33,696 | | 103 | 2 |
| Uganda | | | | | | | | | | | 3,483 | | | | | | | | | |
| USA | 489,844 | | | | | | | | | | | | | | | | | | | |
| Venezuela | | | 21,974 | | | | | | | | | | | | | | | | | |
| Viet Nam | | | | | | | | | | | | | | | | 103 | | | | |
| Zambia | | | | | | | | | | | 11,113 | | | | | | | | | |
| Zimbabwe | | | | | | | | | | | 122,854 | | | | | | | | | |
| TOTAL | 490,012 | 3,867 | 161,625 | 453 | 3,819 | 29 | 0 | 17,128 | 276 | 1,135 | +210,795 | 85,183 | +2,842 | +84,019 | 3,873 | 10,390 | 33,714 | 19 | 775 | 21 |

+ Lack of information from farms in these countries has led to an underestimate of numbers.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| A.mis | *Alligator mississippiensis* | A.sin | *Alligator sinensis* | C.cro | *Caiman crocodilus* | C.lat | *Caiman latirostris* |
| C.acu | *Crocodylus acutus* | C.cat | *Crocodylus cataphractus* | C.int | *Crocodylus intermedius* | C.joh | *Crocodylus johnsoni* |
| C.min | *Crocodylus mindorensis* | C.mor | *Crocodylus moreletii* | C.nil | *Crocodylus niloticus* | C.nov | *Crocodylus novaeguineae* |
| C.pal | *Crocodylus palustris* | C.por | *Crocodylus porosus* | C.rho | *Crocodylus rhombifer* | C.sia | *Crocodylus siamensis* |
| C.pxs | *C. porosus x C. siamensis* | O.tet | *Osteolaemus tetrapis* | T.sch | *Tomistoma schlegelii* | G.gan | *Gavialis gangeticus* |

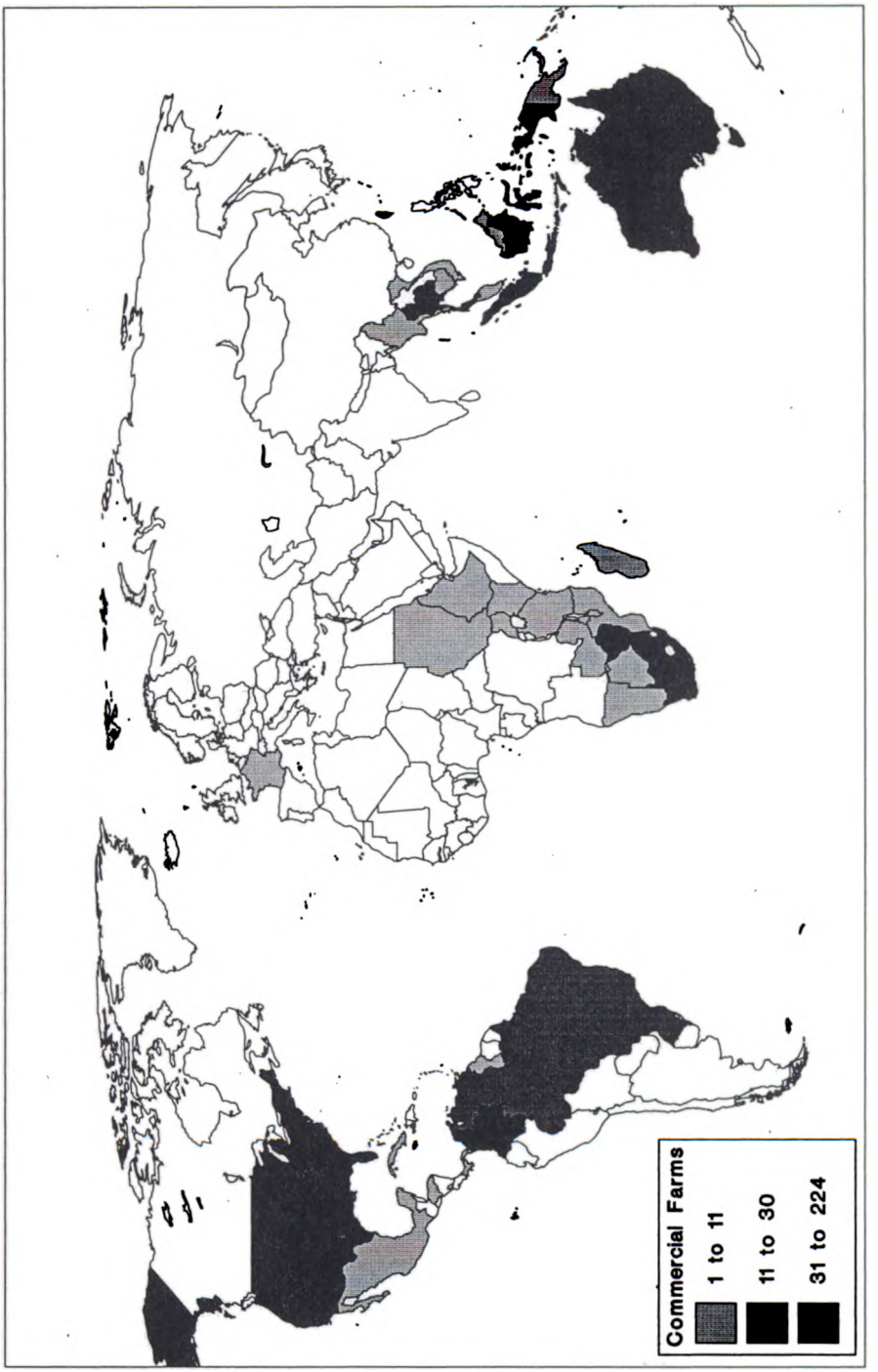
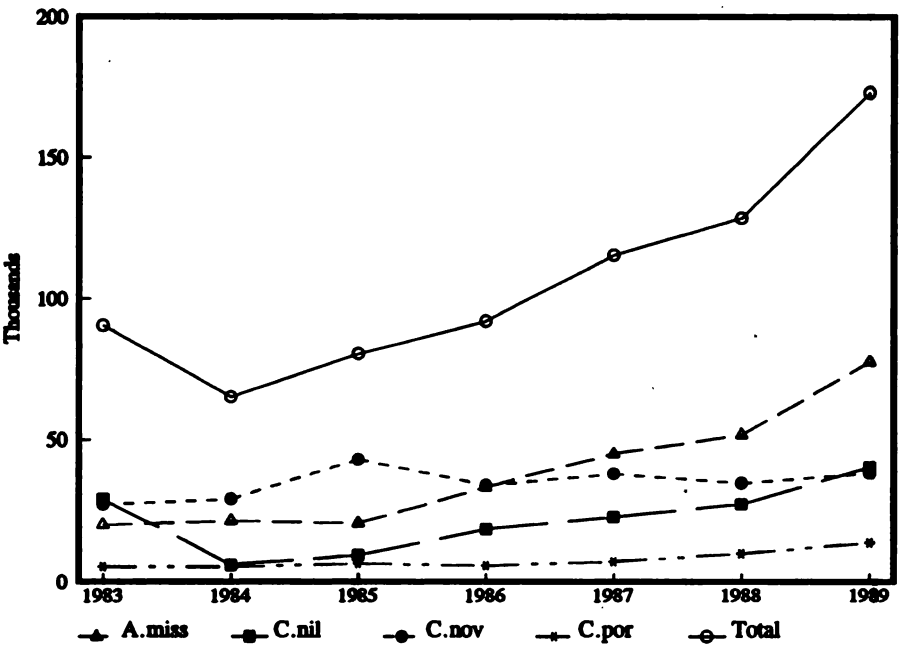



Figure 1. Countries reported as having commercial crocodilian farms.

Figure 2. Estimates of world net trade in skins of the four main species of classic crocodilian (Luxmoore, 1992).




## Trends in trade

The previous edition of the Directory of Crocodilian Farming Operations (Luxmoore *et al.*, 1985) produced an estimate of 152 farms with a total stock of 161,603 crocodilians and a production of 14,796 skins. There has therefore been a substantial rise in the extent and volume of crocodilian farming over the space of seven years. Both estimates of the scale of crocodile farming are subject to inaccuracies, but an additional indication can be obtained from the international trade in crocodilian skins reported in CITES annual reports. This is shown in Figure 2. Although there is known to be a substantial illegal trade in crocodilian skins which is not recorded in these statistics, in particular of *Caiman crocodilus* and *Crocodylus porosus*, it is likely that the majority of the production from the crocodile farms enters the legal trade and is therefore recorded. Of the species traded, the skins of *C. novaeguineae* are mostly wild caught, as are a proportion of those of *A. mississippiensis*, *C. porosus* and a few *C. niloticus*. Estimates of the total skin production from different sources for 1990 are shown in Table 3. Wherever possible, production figures for 1990 were used but, where these were not available, data for 1989 or 1991 were taken. In most cases the data for skin production on the farms did not separate those produced by captive breeding from those produced by ranching. To estimate this, the total skin production was therefore divided up in the proportion of the numbers of hatchlings obtained by captive breeding and from the wild two years previously (i.e. normally in 1988). Total legal production from the

wild was 194,000, while ranching was estimated to contribute 157,000 skins and captive breeding 25,000. Although breeding is currently of minor significance, producing only about 15% of skins, about 25% of animals currently obtained by farms are said to be derived from this source, and so it is likely to increase in significance over the next two years.

There is a variation between the species of crocodilian farmed. Skins of *Caiman crocodilus* and *Crocodylus novaeguineae* are mostly produced from wild harvest with smaller quantities from ranching. For *C. porosus* there is also a significant component from captive breeding. *Alligator mississippiensis* and *C. niloticus* are mostly produced from ranching, with lesser reliance on wild harvest, while the rarer species, *C. rhombifer* and *C. siamensis*, are produced almost exclusively from captive breeding (Table 3, Figure 3).

Figure 3. Estimates of the number of skins of different species of crocodilians produced from wild harvest, ranching and captive breeding (see Table 3).

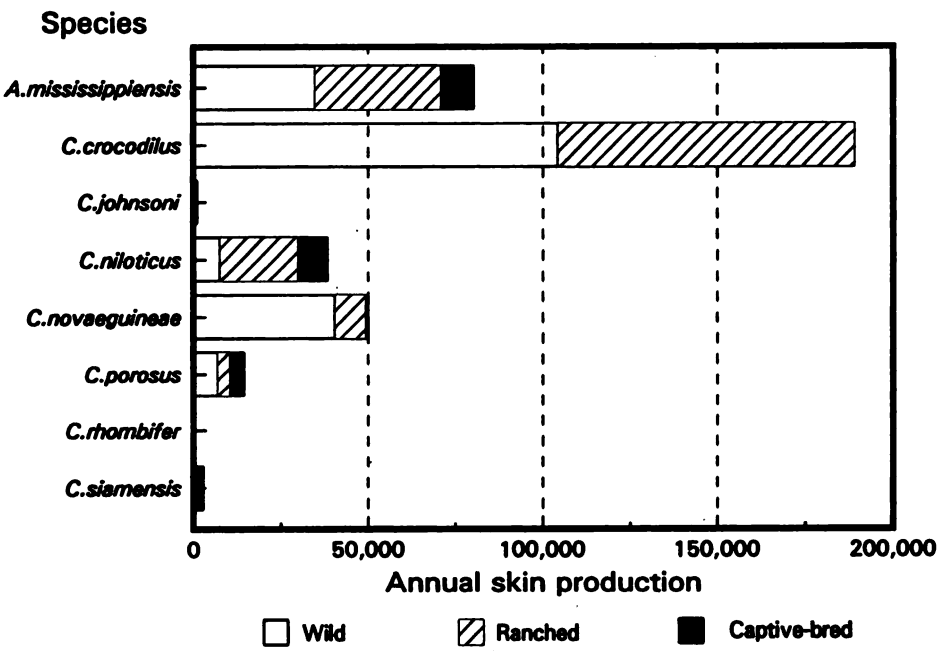


Table 3. Estimates of crocodile skin production 1990 (see notes for Table 1).

| | Wild | Ranched | Capt-bred | Total |
|---|---|---|---|---|
| *Alligator mississippiensis* | 34,807 | 36,084 | 9,385 | 80,276 |
| USA | 34,807 | 36,084 | 9,385 | 80,276 |
| *Caiman crocodilus* | 104,361 | 84,588 | 0 | 188,949 |
| Colombia | 0 | 54,452 | * | 54,452 |
| Guyana | 12,500 | 0 | 0 | 12,500 |
| Taiwan | 0 | 2,000 | * | 2,000 |
| Venezuela | 91,861 | 28,136 | 0 | 119,997 |
| *Crocodylus johnsoni* | 0 | 1,111 | 0 | 1,111 |
| Australia | 0 | 1,111 | 0 | 1,111 |
| *Crocodylus niloticus* | 7,660 | 22,399 | 8,269 | 38,328 |
| Botswana | 0 | 457 | 143 | 600 |
| Ethiopia | 20 | 2,089 | 0 | 2,109 |
| Israel | 0 | 0 | 800 | 800 |
| Kenya | 0 | 812 | 288 | 1,100 |
| Madagascar | 0 | 442 | 0 | 442 |
| Malawi | 0 | 1,123 | 0 | 1,123 |
| Mozambique | 1,000 | 3,000 | 0 | 4,000 |
| Somalia | 500 | 0 | 0 | 500 |
| South Africa | 0 | 0 | 4,747 | 4,747 |
| Sudan | 5,040 | 0 | 0 | 5,040 |
| Tanzania | 1,100 | 0 | 0 | 1,100 |
| Zambia | ? | ? | 0 | 0 |
| Zimbabwe | 0 | 14,476 | 3,091 | 17,567 |
| *Crocodylus novaeguineae* | 40,461 | 8,885 | 601 | 49,947 |
| Indonesia | 16,472 | 4,419 | * | 20,891 |
| Papua New Guinea | 23,989 | 4,466 | * | 28,455 |
| Singapore | 0 | 0 | 601 | 601 |
| *Crocodylus porosus* | 7,006 | 3,500 | 3,906 | 14,412 |
| Australia | 0 | 1,611 | 844 | 2,455 |
| Indonesia | 1,773 | 1,133 | * | 2,906 |
| Malaysia | 0 | 0 | 295 | 295 |
| Papua New Guinea | 5,233 | 756 | 304 | 6,293 |
| Singapore | 0 | 0 | 2,263 | 2,263 |
| Thailand | 0 | 0 | 200 | 200 |
| *Crocodylus rhombifer* | 0 | 0 | 500 | 500 |
| Cuba | 0 | 0 | 500 | 500 |
| *Crocodylus siamensis* | 0 | 0 | 2,800 | 2,800 |
| Thailand | 0 | 0 | 2,800 | 2,800 |
| TOTAL | 194,295 | 156,567 | 25,461 | 376,323 |

* Ranched total may include some captive-bred skins.

**History of CITES control of trade in crocodile products**

The mechanisms by which CITES exerts control over the trade in crocodilian products are more complex than for any other group of organisms. They are summarized in Table 4. All Crocodylia were included in either Appendix I or II in 1975, with the majority in Appendix I. The only taxa left in Appendix II were the two freshwater crocodiles from Oceania, *Crocodylus johnsoni* and *C. novaeguineae novaeguineae*, two saltwater species, *C. porosus* and *C. acutus*, two dwarf caimans from South America, *Paleosuchus* spp., and three subspecies of *Caiman crocodilus* (all except *C. crocodilus apaporiensis*). In 1979, a reassessment of the status of the American Alligator led to its transfer to Appendix II, while certain geographically defined populations of the two widespread saltwater species were transferred to Appendix I: all populations of *C. porosus* outside Papua New Guinea and the population of *C. acutus* in the USA. Later, in 1981, the remaining populations of *C. acutus* were transferred to Appendix I.

Many countries, having experienced heavy exploitation of crocodiles in the past, had introduced protective legislation which had resulted in scattered population increases. These, together with the growing realisation that some other populations were not sufficiently rare to justify inclusion in Appendix I, were to bring calls for mechanisms to allow a resumption of trade in crocodilian products from some sources.

Article VII, para. 4 of CITES allows specimens of Appendix I species which were "bred in captivity" for commercial purposes to be treated as if they were Appendix II specimens. A Resolution adopted in 1979 in Costa Rica (Conf. 2.12) narrowed the definition of "bred in captivity".

At that time there were very few crocodilian farms which fulfilled this definition. One of the oldest, and largest, was in Thailand, which was not then a Party to CITES. The growing crocodile farming industry in Zimbabwe relied on the collection of eggs from the wild and therefore did not fulfil the new definition of "bred in captivity". Recognising that it nevertheless did not threaten the wild population and, indeed, benefited it, the third meeting of the Conference of the Parties sought to arrive at a formula which would allow trade. As the only exemption allowed by the Convention to permit trade in Appendix I species (specimens bred in captivity) had been denied by the adoption of Resolution Conf. 2.12, the remaining option was to transfer the population to Appendix II. The normal mechanism for transferring species from Appendix I to Appendix II, as defined in Resolution Conf. 1.2, requires that the population should be shown to have recovered sufficiently to justify its transfer. As this was not always possible, a new procedure was adopted (Resolution Conf. 3.15) under which "ranched" populations could be transferred to Appendix II. This was first used in 1983, when the Zimbabwean population of *C. niloticus* was transferred to Appendix II and, later, in 1985, for the Australian population of *C. porosus*.

The criteria for ranching, defined in Resolution Conf. 3.15, although not requiring the demonstration that the population has recovered, demand such strict controls on the management of the wild population and the conduct of the ranching operation that many countries without a long history of crocodile management would have great difficulty in fulfilling them. Furthermore, it was realised that as most crocodilians had been included in

Appendix I in 1975, before the Berne Criteria for the addition of species to the appendices (Resolution Conf 1.1) were adopted, there was, for the most part, no information on the size of the wild population at the time of inclusion in Appendix I, and therefore no easy way of demonstrating a population recovery since then. These considerations led to the adoption, in 1985, of some "special criteria for the transfer of taxa from Appendix I to Appendix II" (Resolution Conf. 5.21, later replaced by Resolution Conf. 7.14). These were intended as a temporary measure, until some other mechanism for allowing trade could be complied with, which would allow countries to transfer their populations of the species to Appendix II and export only limited quotas of certain products. Under this system, the populations of *C. niloticus* in Cameroon, Congo, Kenya, Madagascar, Malawi, Mozambique, Sudan, Tanzania and Zambia, and *C. porosus* in Indonesia, were transferred to Appendix II in 1985, followed in 1987 by those of *C. niloticus* in Botswana, and of *C. cataphractus* and *Osteolaemus tetraspis* in Congo. To these were added, in 1989, the populations of *C. niloticus* in Ethiopia and Somalia, and in 1992, those of South Africa and Uganda. Populations of *C. niloticus* in Cameroon, Congo and Sudan and of *O. tetraspis* in Congo were assigned zero quotas in 1989, and therefore once again banned from trade, being finally retransferred to Appendix I in 1992. In 1989, the populations of *C. niloticus* in Botswana, Malawi, Mozambique and Zambia were retained in Appendix II under the terms of Resolution Conf. 3.15, and therefore no longer restricted by export quotas, followed by the populations of Ethiopia, Kenya and Tanzania in 1992. A further complication to the quota system is added by the practice adopted of specifying the source of the specimens which go to make up the quota. Thus the Ethiopian quota for 1991 comprised 2300 ranch-reared, live hatchlings, 6500 ranch-reared skins, 20 skins obtained from the wild and 50 wild hunting trophies. The Quotas adopted are shown in Table 5.

Further refinements were added in 1987 and 1992 to the mechanisms for allowing trade in captive-bred Appendix I species, to allay concerns that there was insufficient control over the establishment of breeding operations. Resolution Conf. 6.21 recommended "that, excepting species for which one commercial captive-breeding operation is included in the Secretariat's Register on 24 July 1987 [i.e. *C. niloticus*, *C. porosus*, *C. siamensis*], the first commercial captive-breeding operation for an Appendix I species be included in the Secretariat's Register only by approval of two-thirds majority vote of the Parties". *Alligator sinensis* was added to the register by this process in 1992. Resolution 8.15 set controls over the acquisition of breeding stock to ensure that farms were not established to the detriment of depleted wild populations.

1987 also saw the introduction of mechanisms omitted from the early resolutions to terminate the trade from captive breeding (Resolution Conf. 6.21) or ranching (Resolution Conf. 6.22) operations which fell short of the requirements established.

The procedure for transferring ranched populations to Appendix II as it was originally envisaged allowed the export both of the products of animals reared on ranches and those of wild-caught animals. The rationale for this is that there is a continuous interchange between the wild population and the stock held on the ranches and so they are both part of the same population. However, it was later realized that this might result in the extraction of large numbers of skins from wild populations. Resolution Conf. 8.22 therefore imposed clear restrictions by requiring Parties "to limit the manner of exploitation of wild populations to

those techniques described in the proposal and not, for example, later to initiate new short-term programmes for taking wild animals without notifying the Secretariat". It further recommends that "any wild harvest component of a ranching proposal normally be limited to a reasonable number commensurate with the control of nuisance animals and sport hunting".

The result of this convoluted history is that there have been at least seven different mechanisms for exerting control over trade in crocodilians under CITES, ranging from Appendix I listing and a complete trade ban, through various limited trade regimes, involving captive breeding, quota systems and ranching, to simple inclusion in Appendix II. Different populations of any species may be included in different categories, the current record being held by *C. niloticus*, which is subject to five different control categories throughout its range (Table 4). The controls in force are summarized in Part 1 of this book.

**Impact on conservation**

Crocodilian populations have declined in many parts of the world, and this has been linked to the uncontrolled trade in their skins which took place before the implementation of CITES. Crocodilian skins are a luxury product and, with the exception of *Alligator mississippiensis* and *Crocodylus acutus* in the southern USA, most major wild populations are remote from the main markets. As they are seldom hunted for meat, the majority of trade is international and therefore susceptible to control by CITES.

The ban on commercial trade imposed by inclusion in Appendix I varied in effectiveness: in some countries, such as the USA and Australia, the trade was brought under control with the aid of strict domestic protection measures. In others, commercial extinction contributed to a decline in trade, as with *Melanosuchus niger* in South America and *C. porosus* in the Indian sub-continent. Elsewhere, where large populations of Appendix I species remained, such as *C. porosus* in Southeast Asia and *C. niloticus*, trade continued, mostly to non-Parties and Parties holding reservations, especially Italy, France and Japan. From 1984 onwards, these routes became progressively restricted, and there is evidence that the volume of trade in Appendix I skins began to fall as a result of CITES controls (Dixon and Barzdo, 1988). It is perhaps no coincidence that this was accompanied by widespread moves from around the world to find legitimate alternative methods to continue trade in the more abundant populations and this provides evidence that CITES may have begun to work as it was intended. In the following sections, the implications for the conservation of crocodilians of the various different trade control regimes will be discussed.

*Appendix I listing*

Although theoretically providing the greatest level of protection, a complete trade ban has several drawbacks. It requires substantial investment in local protection measures by the range states if it is to be effective in the absence of unanimous efforts by all potential markets to control imports. More importantly, it provides no immediate commercial incentive to counter the conflicting demands for the eradication of crocodilians. If sometimes ill-informed, these are numerous because, even if crocodilians are not perceived to pose a threat to humans or livestock, they are often considered to damage fishing gear or compete for fish stocks. There is therefore the double cost of policing protection measures amongst a

potentially alien public who would wish crocodilians removed even in the absence of commercial skin hunting.

In compensation, a complete trade ban is more simple to police and legislate for than a partial ban and, if it is successful in reducing the demand for the final product, may result in a drop in price which could reduce the incentives for illegal trade. Both of these advantages are offset by the existence of several populations of crocodilians in Appendix II, the skins of which are scarcely distinguished by the final consumer and only with difficulty by the enforcement agencies.

*Captive breeding*

The breeding of crocodilians in captivity in accordance with Resolution Conf. 2.12 need have minimal direct impact on wild populations. Theoretically, once the founder breeding stock has been obtained, the breeding operation can be entirely self-contained and place no further drains on the wild. In practice, captive-breeding operations are often only set up after the local wild populations have become seriously depleted, and obtaining breeding stock depletes them further. Crocodile farming is an expensive business, and thé need to hasten a positive cash flow may encourage even successful farmers to obtain further stock from the wild. It was in response to concerns such as these that a resolution was adopted at the CITES conference in 1992 controlling the permissible means for establishing the breeding stock.

Furthermore, although captive breeding need have no direct negative impact on wild populations, it also has no direct positive impact. A captive-breeding operation, once independent of the wild, provides no incentive for conserving wild populations.

One final problem associated with the commercial captive breeding of crocodilians concerns the deliberate release or accidental escape of exotic (non-native) species. Although the breeding and release into their former habitat of severely endangered crocodilians, such as the Gharial, can and does benefit their conservation enormously, the release of crocodilians into areas outside their natural range has caused problems. If the habitat is suitable they may breed and establish feral populations which may have serious effects on the local ecosystems. Feral populations of *Caiman crocodilus* have built up in Florida, Cuba and Puerto Rico where they have proved impossible to eradicate. The *Caiman* introduced to Isla de Juventud, Cuba, have been blamed for the disappearance of the native *Crocodylus rhombifer* from the island as a result of ecological competition. These releases are thought to have resulted from animals originally imported as pets and none has yet occurred as a result of farming activities. However the industry is still young and, if not checked, releases are bound to occur eventually. The experience of the fur farming industry has many examples of such escapes and it is responsible for the introduction of Mink, Coypu, Raccoon Dog and Musk Rat well outside their natural range. In the early stages of an industry, the livestock command high prices and great care is usually taken with their security, but as time goes by and profitability declines, maintenance of the facilities tends to be neglected. These concerns led the IUCN/SSC Crocodile Specialist Group to recommend against the use of crocodilians for farming operations outside their natural range especially within the range of other species of crocodilian.

Table 4. Status of the different species of crocodilian under CITES controls.

| CITES Status | Species | Countries |
|---|---|---|
| Appendix I | *Alligator sinensis* | All countries |
| | *Caiman crocodilus apaporiensis* | All countries |
| | *Caiman latirostris* | All countries |
| | *Melanosuchus niger* | All countries |
| | *Crocodylus acutus* | All countries |
| | *Crocodylus cataphractus* | All countries |
| | *Crocodylus intermedius* | All countries |
| | *Crocodylus moreletii* | All countries |
| | *Crocodylus niloticus* | All except countries listed below |
| | *Crocodylus novaeguineae mindorensis* | All countries |
| | *Crocodylus palustris* | All countries |
| | *Crocodylus porosus* | All except PNG, Indonesia & Australia |
| | *Crocodylus rhombifer* | All countries |
| | *Crocodylus siamensis* | All countries |
| | *Osteolaemus tetraspis* | All countries |
| | *Tomistoma schlegelii* | All countries |
| | *Gavialis gangeticus* | All countries |
| Appendix I Captive breeding | *Alligator sinensis* | China |
| | *Crocodylus niloticus* | South Africa, Israel |
| | *Crocodylus porosus* | Australia, Thailand |
| | *Crocodylus siamensis* | Thailand |
| Appendix I Reservation | *Crocodylus niloticus* | Sudan |
| Appendix II | *Alligator mississippiensis* | All countries |
| | *Caiman crocodilus* (other subspecies) | All countries |
| | *Paleosuchus palpebrosus* | All countries |
| | *Paleosuchus trigonatus* | All countries |
| | *Crocodylus johnsoni* | All countries |
| | *Crocodylus novaeguineae novaeguineae* | All countries |
| | *Crocodylus porosus* | Papua New Guinea |
| Appendix II Ranching | *Crocodylus niloticus* | Botswana, Ethiopia, Kenya, Malawi, Mozambique, Tanzania, Zambia, Zimbabwe |
| | *Crocodylus porosus* | Australia |
| Appendix II Quotas (see Table 2) * zero quota | *Crocodylus niloticus* | Madagascar, Somalia*, South Africa, Uganda |
| | *Crocodylus porosus* | Indonesia |

Table 5. Export quotas, excluding hunting trophies, for populations of crocodilians transferred to Appendix II under the special criteria set out in Resolutions Conf. 5.21 and 7.14.

| | | +1985 | +1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Crocodylus niloticus* | | | | | | | | | | | |
| Botswana | W | I | I | 2000 | 2000 | 2000 | RII | RII | RII | RII | RII |
| Cameroon | W | 20 | 20 | 100 | 100 | 100 | 0 | 0 | 0 | I | I |
| Congo | W | 1000 | 1000 | 150 | 150 | 150 | 0 | 0 | 0 | I | I |
| Ethiopia | W | I | I | I | I | I | 20 | 20 | 20 | RII | RII |
| | R | | | | | | 9300 | 8800 | 4500 | | |
| Kenya | W | 150 | 150 | 1000 | 1000 | 1000 | 0 | 0 | 0 | RII | RII |
| | R | | | 4000 | 4000 | 4000 | 5000 | 6000 | 8000 | | |
| Madagascar | W | 1000 | 1000 | 1000 | 3784 | 1000 | 0 | 0 | 100 | 100 | 100 |
| | R | | | | | | 0 | 2000 | 3000 | 4000 | 4300 |
| Malawi | W | 500 | 500 | 700 | 700 | 700 | RII | RII | RII | RII | RII |
| | R | | | 200 | 1000 | 1600 | | | | | |
| Mozambique | W | 1000 | 1000 | 1000 | 1000 | 1000 | RII | RII | RII | RII | RII |
| | R | | | | | 3000 | | | | | |
| Somalia | W | I | I | I | I | I | 500 | 500 | 500 | 0 | 0 |
| South Africa | R | I | I | I | I | I | I | I | 1000 | 1000 | 1000 |
| Sudan | W | 5000 | 5000 | 5000 | 5000 | 5000 | 5040 | 0 | 8000 | I | I |
| Tanzania | W | 1000 | 1000 | 2000 | 2000 | 2000 | 1000 | 1000 | *400 | *200 | *200 |
| | R | | | | | | | 4000 | RII | RII | RII |
| Uganda | R | I | I | I | I | I | I | I | 2500 | 2500 | 2500 |
| Zambia | W | 2000 | 2000 | 2000 | 2000 | 2000 | RII | RII | RII | RII | RII |
| | R | | | 1350 | 3600 | 6200 | | | | | |
| *Crocodylus cataphractus* | | | | | | | | | | | |
| Congo | W | I | I | 600 | 600 | 600 | 600 | 600 | 600 | I | I |
| *Osteolaemus tetraspis* | | | | | | | | | | | |
| Congo | W | I | I | 500 | 500 | 500 | 0 | 0 | 0 | I | I |
| *Crocodylus porosus* | | | | | | | | | | | |
| Indonesia | W | 2000 | 2000 | 2000 | 4000 | 4000 | 3000 | 3000 | 2700 | 1500 | 1500 |
| | R | | | | | | 2000 | 3000 | 7000 | 7000 | 7000 |

W - Wild-collected skins. R - Ranched skins. I - Population in Appendix I
RII - Population in Appendix II under the terms of Resolution Conf. 3.15 on Ranching.
+ - Quotas set in 1985-86 made no distinction between Wild-collected and Ranched skins.
* - Quota for wild skins as defined in ranching proposal

*Ranching*

Ranching of crocodilians is dependent on the supply of eggs or hatchlings from the wild which, in turn, necessitates maintaining a healthy breeding population. Because of the high mortality experienced by young crocodilians under natural conditions, it has very little effect on recruitment to the adult population: the removal of 1000 hatchlings may result in the production of over 900 two-year-old crocodiles on a farm but it would probably only reduce the number of animals reaching two years old in the wild by less than 50. It is therefore an extremely safe method of exploiting a wild population, with very little risk of over-harvest but providing a strong incentive to conserve animals of breeding age in the wild. The main risk is that of using ranches as a cover for illegal skin trade but this can be countered by effective monitoring of the stock on the ranch.

*Wild skin harvest*

The hunting of crocodiles also depends on having a healthy wild population but it is usually directed first at the largest animals, because these have the most valuable skins. This is the segment of the population which is least able to sustain a wild harvest because the older animals have low levels of natural mortality and are responsible for the majority of breeding in the wild. Wild harvest of skins therefore carries with it the greatest risk of over-exploitation and history shows that it has had this result in many countries. There are some instances where it has been carried out on a sustainable basis but these have usually been very closely managed by the imposition of strict quotas or size limits. Extensive wild harvest is therefore not advisable in the absence of a strong enforcement infrastructure. However, selective hunting of problem animals may be a useful tool both in minimising conflict with humans and in defusing public resentment.

Although the CITES controls on trade in crocodilian products seem, and indeed are, extraordinarily complex, it is worth noting that crocodilians are probably the only group of species several of which were once included in CITES Appendix I which have demonstrably recovered in numbers from previous levels of over-exploitation and which, as a result, have now re-entered international trade. Furthermore, the commercial incentive provided by international trade in crocodile skins has helped to engender public acceptance for species which are otherwise often regarded as harmful or, at best, useless. If crocodiles continue to increase in numbers in many parts of the world, who would object to the bureaucracy needed to achieve this result? There are so many simple and not-so-simple regulatory systems that have failed to protect the resource that they were set up to regulate that it would be unwise to criticise the CITES controls on the grounds that they are cumbersome. At least they appear to work for crocodilians.

Finally, the tendency to regard captive breeding as a panacea for the conservation of wild species should be seriously questioned. The experience of the commercial crocodile farming industry provides some of the best examples of the value of the controlled exploitation of wild populations through ranching. Captive breeding has few of the advantages associated with ranching and may, indeed, undermine many of its advantages.

# Crocodilian Farming Operations

## Country Accounts

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

Angola is not a Party to CITES.

All three species are totally protected under the Hunting Regulations of 11 December 1957. Possession of and/or trade in these species is prohibited. International trade is prohibited/regulated.

There are believed to be no commercial crocodile farms in Angola.

Species present: *Caiman crocodilus yacare*
*Caiman latirostris*

CITES entered into force in Argentina on 8 April 1981.

The hunting of both species has been totally banned by provincial laws since at least 1960. *Ley* No.22.344 of 1980 ratifies CITES. *Ley* No.22.421 of 1981 regulates wildlife trade at the national level. *Reglamentación* No.691/81 of 1981 enforces both aforementioned laws, and specifically prohibits the hunting of *C. latirostris*. *Artículo* 117 of the *Reglamentación* prohibits the import of *C. latirostris* and *C. crocodilus*, and *Artículo* 124 of the *Reglamentación* prohibits the export of *C. latirostris*, but exports that meet standards for scientific, educational and cultural purposes fall outside these prohibitions. *C. crocodilus* is protected by *Artículo* 7 of *Ley* 22.421, which governs hunting and specifically prohibits the import of products and sub-products that are protected from hunting and trade throughout the country. *Resolución* No.134 of 13 May 1976 prohibits the exportation of raw skins of *C. crocodilus yacare*. *Resolución* No.793 of 6 November 1987 bans the export, inter-provincial transport and trade in the Argentine Federal Territories of products and sub-products derived from *C. crocodilus* and *C. latirostris* (Notification to the Parties No.478). The export of *C. crocodilus* was not specifically banned by the national legislation until 6 November 1987; however, since the hunting of both species was prohibited by provincial laws, the export of Argentine specimens was in fact never allowed. The importation of all subspecies of *C. crocodilus* was recently prohibited by a *Resolución*, under *Ley* 22.421, in May 1991.

There are no commercial crocodilian farms in Argentina, but there are at least two of an experimental nature.

## Estacion Zoologica Experimental

Bv. Peccegrini 3100-3000 Santa Fe, Argentina

Manager: Dr A. Larriera
Date of Establishment: 01/01/84
Date of Census: 01/12/89
Total Area: 2 hectares (3 breeding ponds, 12 rearing ponds)
Food: Beef, fish from river, supplement of vitamins and minerals

The station is run by the Ministry of Agriculture and Livestock, Santa Fe. It is not commercial and was initially set up for research using confiscated animals. A total of 18 nests have been produced since 1984, eleven in the last three years. An experimental ranching scheme is also operated whereby eggs are collected from the wild and the resulting hatchlings reared for eight months before being released into suitable habitats. A harvest of 1000-2000 eggs is planned for 1992 with the aim of commercial production.

| | Stock on farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.latirostris* | 58 | 65 | 11 | 19 | 153 |

| | Spp. | 1st | 1988 | 1989 | 1990 | 1991 |
|---|---|---|---|---|---|---|
| Captive breeding | C.lat | 1985 | 22 | 44 | 60 | 108 |
| Eggs collected | C.lat | 1980 | - | - | - | 372 |

Source of Information: Questionnaire; Larriera, 1990 and 1992

## El Bagual Ecological Reserve

Salta 944, 3600 Formosa City, Formosa, Argentina

Manager: Angel Alberto Yanosky

The Reserve runs a research programme to breed both Argentine species of caiman (*Caiman crocodilus* and *C. latirostris*). Breeding of *C. latirostris* was reported in 1991, and three nests were laid on the reserve the following year, two being collected for artificial incubation.

Source of Information: Yanowski and Mercolli, 1992

Species present: *Crocodylus johnsoni*
*Crocodylus porosus*

CITES entered into force in Australia on 27 October 1976.

## Commonwealth legislation

Under the Wildlife Protection (Regulation of Exports and Imports) Act, 1982, the two species are listed under Schedule 2 - species which could become threatened with extinction if trade is not controlled. They are protected under the following Sections:

**Section 10 states:** Management programmes may be approved in accordance with the law.

**Section 25 states:** As a Schedule 2 animal, an export may only be granted if it will not contribute to trade or be detrimental to the survival of the species or subspecies of the population of animals or plants specified in Schedules 1, 2 or 3.

**Section 29 states:** A Schedule 2 animal may be exported if:

a) the exporting country has authority and the importing country has the relevant permission;
b) the export is for scientific or zoological purposes;
c) the animal has been bred in captivity and was taken in accordance with an approved management programme.

The importation of a Schedule 1 or 2 animal (both are relevant to crocodiles) may only take place with the permission of the relevant authorities of the country of origin, and provided that the import is for zoological or scientific purposes, and that the animal is, or is derived from, a captive-bred animal.

Total number of farms and the stock and production of *C. johnsoni* and *C. porosus* in Australia is summarized in the following table.

| States | No. Farms | Stock | | Skin production | Eggs/juven from wild | Farm-bred hatchlings |
|---|---|---|---|---|---|---|
| Northern Territory | 4 | *C.johnsoni* | 14,938 | 1,111 | 4,410 | - |
| | | *C.porosus* | 13,326 | 1,948 | 7,300 | 1,092 |
| Queensland | 6 | *C.johnsoni* | 757 | | - | 315 |
| | | *C.porosus* | 11,571 | 507 | - | 3,319 |
| W. Australia | 3 | *C.johnsoni* | 1,433 | - | 1,762 | - |
| | | *C.porosus* | 362 | - | 83 | 45 |
| TOTAL | 13 | | 42,387 | 3,566 | 13,555 | 4,771 |

### Northern Territory

*C. johnsoni* is protected under the Wildlife Conservation Ordinance of 1962. This was superseded by the Territory, Parks and Wildlife Conservation Ordinance, 1976; *C. porosus* was protected under the Wildlife Conservation and Control Ordinance 1962-1974, later replaced in 1976 by the Territory, Parks and Wildlife Conservation Ordinance.

This Ordinance prohibits the taking or destruction of protected wildlife. It is an offence to possess or trade in live or dead crocodiles, their parts or their eggs without a permit issued by the Director of Conservation or his delegate.

## Crocodile Farms (N.T.) Pty Ltd

P O Box 86, Palmerston, 0831 Northern Territory, Australia

Manager: John Bache
Date of Establishment: 01/01/80
Date of Census: 01/06/90
Total Area: 48 hectares (64 breeding ponds, 78 rearing ponds)
Food: Chicken by-products from local and interstate suppliers also red meat (horse/buffalo) for hatchlings.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | 30 | - | - | 30 |
| *C.johnsoni* | - | 1139 | 58 | 48 | 1245 |
| *C.porosus* | 3137 | 3574 | 168 | 237 | 7116 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | 1983 | 104 | 81 | 152 | 83 |
| | C.por | 1983 | 614 | 396 | 719 | 909 |
| Eggs collected | C.por | 1983 | 797 | 999 | 1629 | 2356 |
| Hatchlings collected | C.joh | 1987 | 200 | 309 | 9 | 262 |
| Skins produced | C.por | 1987 | 122 | 914 | 1210 | 1413 |

Source of Information: Questionnaire

## Janamba Croc Farm

Box 92, Humpty Doo, 5791 Northern Territory, Australia

Manager: Leo Anictomatis

Although skins were produced in 1990 none was exported.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.johnsoni* | 1306 | 5333 | - | - | 6639 |
| *C.porosus* | 1347 | 2155 | -112- | | 3614 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.joh | - | 3 | - | - | - |
| | C.por | - | - | 48 | 203 | 183 |
| Eggs collected | C.joh | - | - | - | - | - |
| | C.por | 1983 | 744 | 1136 | 1097 | 1222 |
| Hatchlings collected | C.joh | - | 1431 | 972 | 1451 | 568 |
| Skins produced | C.joh | - | - | - | 914 | 661 |
| | C.por | - | - | - | 26 | 213 |

Source of Information: Manolis *in litt.*, 1991

## Lagoon Crocodile Farm Pty Ltd

P O Box 4694, Darwin, 0801 Northern Territory, Australia

Manager: John Hannon
Date of Establishment: 01/10/87
Date of Census: 01/02/90
Total Area: 50 acres (20.23ha), (4 breeding ponds, 25 rearing ponds)
Food: Chicken, fish and horse meat: interstate/local chicken abattoir and local pet food supplier

A relatively new farm, relying on ranching but in the process of establishing breeding stock of *C. porosus*. Many *C. johnsoni* hatchlings have been purchased from other farms. Total stock of *C. porosus* on 31 July 1991 was said to be 2103 (Webb *in litt.*, 1990).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.johnsoni* | 3333 | 3319 | - | - | 6652 |
| *C.porosus* | 650 | 5 | 3 | 4 | 662 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.por | 1990 | - | - | - | - |
| Hatchlings collected | C.joh | 1989 | 1480 | 2201 | 3292 | 2139 |
| | C.por | 1990 | - | - | - | 2425 |
| Skins produced | C.joh | - | - | - | - | 250 |
| | C.por | - | - | - | - | 12 |

Source of Information: Questionnaire; Webb, 1990

## Letaba Crocodile Ranch

P O Box 2351, Darwin, 0801 Northern Territory, Australia

Manager: Hilton D. Graham
Date of Establishment: 01/11/84
Date of Census: 31/12/89
Total Area: (2 breeding ponds, 30 rearing ponds)
Food: Horse meat and chicken heads: local and interstate produce.

Total stock on the 31 July 1990 was said to be 2684 *C. porosus* and 289 *C. johnsoni* (Webb *in litt.*, 1990).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.johnsoni* | 140 | 262 | - | - | 402 |
| *C.porosus* | 740 | 1144 | 25 | 25 | 1934 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.joh | 1982 | - | 1533 | 1910 | 1441 |
| | C.por | 1984 | 670 | 685 | 8561 | 1297 |
| Hatchlings collected | C.joh | 1982 | - | - | - | - |
| Skins produced | C.joh | 1987 | - | - | - | 200 |
| | C.por | 1987 | 20 | 100 | 200 | 310 |

Source of Information: Questionnaire

### Queensland

*C. johnsoni* and *C. porosus* are protected under the Fauna Order in Council of 29 August, 1974, and the Fauna Conservation Act of 1974. *C. porosus* has also had protection under the Fauna Conservation Regulations since 1974. Both species are declared to be protected fauna for the purpose of the Act. The term fauna also includes any whole animal, carcass, skin or egg, any flesh or offal, whole tanned skins and stuffed specimens; the term excludes processed products. Protected species shall not be taken without the relevant permit issued by the Minister of the Crown; however a person may kill an estuarine crocodile in the belief, on reasonable grounds, that the animal has caused, is causing, or is likely to cause injury to a person. Where a crocodile is taken in contravention of the Act a royalty payment must be made to the Crown of $150 per metre for *C. porosus* or $25 per metre for *C. johnsoni*.

The Fauna Conservation Act also specifies the duties of the owner of premises where fauna are housed for commercial purposes. Permits are required for movement of fauna to, from and within Queensland.

## Edward River Crocodile Farm Pty Ltd

Edward River, Cape York, PO. Box 669 Cairns, 48 Queensland, Australia

Manager: Vic Onions
Date of Establishment: 01/01/73
Date of Census: 31/12/89
Total Area: (14 breeding ponds, 25 rearing ponds)
Food: Chicken, beef, horse and wild pig from local suppliers (chickens from Cairns)

Registered captive-breeding operation (CITES Notification No.336, 28 January 1985) for *C. porosus*. Holds a "Class A licence" to deal in wildlife. The farm was initially set up as an experimental project to benefit the Aboriginal populations of a remote region of far-northern Queensland. A second site was established in 1989 close to Cairns (Redbank) where there is a more reliable food source. It will also cater for tourists. Collaborative research is carried out with James Cook University and the University of Queensland. All crocodiles from Dundee Park, which is no longer operational, were relocated to Edward River Crocodile Farm.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | 2810 | 6496 | 165 | 495 | 9966 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | - | 2392 | 2415 | 3307 | - |
| Skins produced | C.por | 1984 | 371 | 200 | 507 | - |

Source of Information: Questionnaire; Anon., 1985a; Boyland *in litt.*, 1991; QNPWS, 1990

## Hartleys Creek Crocodile Farm

Captain Cook Highway, Wangetti, 4879 Queensland, Australia

Manager: Peter John Freeman
Date of Establishment: 01/05/86
Date of Census: 31/12/89
Total Area: 10 acres (approx.) (4.05ha), (20 breeding ponds, 14 rearing ponds)
Food: Chicken by-products, feral pig, processed kangaroo and day old roosters

A rapid expansion of captive breeding is planned, once the sub-adults of both species mature. Commercial skin production was expected to start in 1990. Holds a "Class A licence" to deal in wildlife.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.johnsoni* | 282 | 217 | 25 | 197 | 721 |
| *C.porosus* | 12 | 362 | 33 | 23 | 430 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.joh | - | 150 | 250 | 315 | - |
| | C.por | 1987 | 200 | 275 | 12 | - |
| Skins produced | C.por | 1990 | - | - | - | - |

Source of Information: Questionnaire; QNPWS, 1990

## IFRA-FORD Pty Ltd

McKinley Creek, Seaforth Road, (POB 976) Mackay, 4740 Queensland, Australia

Manager: Albert Ramsamy
Date of Establishment: 04/11/88
Date of Census: 31/12/89
Total Area: (2 breeding ponds)
Food: Wild pig, chicken and fish: own fishing trawler, breed own chickens

Not yet licensed as a crocodile farm.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | - | - | 2 | 10 | 12 |

Source of Information: Questionnaire; QNPWS, 1990

## Johnstone River Crocodile Farm

P O Box 381, Innisfail, 4860 Queensland, Australia

Manager: Mick Tabone

Not yet licensed as a crocodile farm.

Source of Information: QNPWS, 1990

## Koorana Crocodile Farm

M.S.F. 76, Rockhampton Mail Centre, Rockhampton, 4700 Queensland, Australia
Manager: John Lever
Date of Establishment: 01/01/81
Date of Census: 01/05/90

Holds a "Class A licence" to deal in wildlife.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.johnsoni* | - | - | - | - | 36 |
| *C.porosus* | - | - | - | - | 1045 |

Source of Information: QNPWS, 1990

## Mr Crocodile Pty Ltd

Boulder Road, Babinda, Box 88, Manunda, 4870 Queensland, Australia

Manager: Peter Shoenemann
Date of Establishment: 22/01/90
Date of Census: 31/08/90
Total Area: 42.57 hectares (31 breeding ponds, 1 rearing pond)

Food: Chicken from local area

Holds a "Class A licence" to deal in wildlife. Said to have obtained excess stock from Marineland Melanesia, a zoo located in Queensland, in 1990. However, according to Manolis (*in litt.*, 1991) this transaction did not go ahead.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | - | 100 | 6 | 12 | 118 |

Source of Information: Questionnaire; Craig *in litt.*, 1990; Manolis *in litt.*, 1991; QNPWS, 1990

### Western Australia

*C. johnsoni* is protected under the Fauna Conservation Act of 1974; *C. porosus* is protected under the Fauna Conservation Act of 1950, although protection came into force only in 1970, by notice. Listed under Schedule 2, they are classified as species which require special protection.

## Broome Crocodile Park

P O Box 621, Broome, 6725 Western Australia, Australia

Manager: Malcolm Douglas
Date of Establishment: 01/01/83
Date of Census: 31/12/89
Total Area: 5 acres (2.02ha), (36 breeding ponds, 4 rearing ponds)
Food: Fish, poultry, kangaroo (pet meat): charter fishing boat, pet food wholesaler

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus fuscus* | - | - | 4 | - | 4 |
| *C.johnsoni* | - | - | 9 | 1 | 10 |
| *C.porosus* | 34 | 64 | 17 | 14 | 129 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive Breeding | C.por | 1984 | 22 | 35 | 45 | - |
| Hatchlings collected | C.por | 1987 | 30 | - | - | - |

Source of Information: Questionnaire

## Freemantle Crocodile Park

PO. Box 1329, Freemantle, 6160 Western Australia, Australia

Date of Census: 01/10/90
Total Area: (9 breeding ponds, 5 rearing ponds)
Food: Chicken waste, prawn heads, bacon and kangaroo meat with calcium and vitamins.

Initially opened as a display facility but obtained a licence to sell skins in 1990. The farm is totally enclosed and kept at 29-30°C. Most of the stock was purchased from Janamba Crocodile farm (NT) but some had been collected from the Ord river where the company maintains a holding station at Kununurra.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.johnsoni* | - | 48 | -8- | | 56 |
| *C.porosus* | - | 67 | 7 | 1 | 75 |

Source of Information: Luxmoore pers. comm., 1990

## Wyndham Crocodile Farm

Wyndham, 6740 Western Australia, Australia

Manager: Nigel Palmer
Date of Establishment: 01/04/90
Date of Census: 30/07/90
Total Area: 4 hectares (32 breeding ponds, 18 rearing ponds)
Food: Kangaroo and horse meat from pet food suppliers in Perth, W.A. and N.T.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.johnsoni* | 1275 | 82 | 5 | 5 | 1367 |
| *C.porosus* | 49 | 82 | 14 | 13 | 158 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.por | 1989 | - | - | 53 | - |
| Hatchlings collected | C.joh | 1989 | - | - | 1762 | - |

Source of Information: Questionnaire

Species present: *Crocodylus palustris* (extinct in wild)
*Crocodylus porosus*
*Gavialis gangeticus*

CITES entered into force in Bangladesh on 18 February 1982.

These species are protected under the Wildlife Protection Act of 28 March 1973. Listed on the third schedule, *C. palustris*, *C. porosus* and *G. gangeticus* may not be hunted, captured or destroyed. Crocodile skins are listed on the second schedule, and must be accompanied by a certificate of lawful possession in order to transport or import them.

There are no commercial crocodile farms in Bangladesh, but there is a captive population of *C. palustris* at Peer Khan Ali Pond, Bagerhat. All three species are also kept at Dhaka Zoo (Rahman, 1990).

Species present: *Crocodylus acutus*
*Crocodylus moreletii*

CITES entered into force in Belize on 2 September 1986.

The Wildlife Protection Act of 1981 imposes a seven-year moratorium on commercial trade in wildlife, their parts and products. This followed an administrative ban on wildlife commerce announced in 1978. Imports and exports must conform to the moratorium. Hunting of *C. acutus* and *C. moreletii* is prohibited under this Act. This moratorium was extended for a further two years just before it expired, in order to allow time to accumulate research data needed for Belize to begin managing wildlife and regulate hunting, as some species are in danger of being over-exploited.

There are believed to be no commercial crocodile farms in Belize.

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

Benin became a Party to CITES on 28 May 1984.

All three species are totally protected under the *Ordonnance portant réglementation de la protection de la nature et de l'exercice de la chasse* of 2 November 1980. Possession of and/or trade in these species is prohibited. International trade is prohibited/regulated.

There are believed to be no commercial crocodile farms in Benin.

Species present: *Caiman crocodilus*
*Caiman latirostris*
*Melanosuchus niger*
*Paleosuchus palpebrosus*
*Paleosuchus trigonatus*

Bolivia became a Party to CITES on 4 October 1979.

*Ley de Silvestre* No.12301 is the general wildlife law of Bolivia. *Decreto Supremo* No.16605 was issued by the Bolivian Cabinet on 20 June 1979, prohibiting hunting and trade in native wildlife species, other than those bred in captivity, considered to be in danger of extinction. This included *M. niger*, *P. palpebrosus* and *P. trigonatus*. *Decreto Supremo* 16606 gives the same protection to *C. crocodilus*. Controversy exists over the validity of these laws as scientific errors in the species listings exist. Despite this decree, reptile hides from wild populations have been authorized for exportation. On 27 June 1986, *Decreto Supremo* No.21312 was passed which prohibited the general basis of capture, manufacture, trade and export of live wild animals, their parts and products. An exception was made for *C. crocodilus* for which an export quota of 50,000 skins annually was granted to the *Asociación Industrias de Curtiembre de Saurios* (ASICUSA - a Bolivian tanning association). CITES Resolution 6.4 recommended that caiman skin imports from Bolivia only be allowed if the shipments of skins or products are finished (i.e. tanned, dyed and glazed), and that they are accompanied by a certificate from the *Société Général de Surveillance*, (a Swiss company engaged by the Bolivian government to control all exports).

A caiman farm, Moxos Alligator Ranch, was proposed at La Ponderosa ranch, Trinidad, but its current status is unknown. A private conservation group (PRODENA) has been involved in establishing a release programme for *M. niger* using animals that have been maintained in captivity.

Species present: *Crocodylus niloticus*

Botswana became a Party to CITES on 12 February 1978.

*C. niloticus* was transferred from CITES Appendix I to II on 3 January 1987, under the special criteria set out in Resolution Conf. 5.21, subject to annual quotas. The following quotas were agreed by the Conference of the Parties. The population was retained in Appendix II under the conditions of Resolution Conf. 3.15 on ranching on 18 January 1990.

| Annual quota | 1986 | 1987 | 1989 | 1990 |
|---|---|---|---|---|
| Wild | - | 2000 | 2000 | 2000 |

Protected under the Fauna Conservation Proclamation of 1961, *C. niloticus* is offered only partial protection. Hunting and capture are prohibited without a correct licence or permit. Trade is permitted under certain licences. Imports and exports of animals, trophies and meat, and manufacture of articles from trophies are prohibited unless the relevant permit has been obtained.

Although several other farms have been proposed, there are currently only three farms operating in Botswana.

## Chobe Crocodile Farm

P.O. Box 109, Kasane, Botswana

Manager: Mike Slogrove
Date of Establishment: 01/05/85
Date of Census: 31/12/89
Total Area: 5 hectares (4 breeding ponds, 17 rearing ponds)
Food: Donkeys purchased locally

Registered captive-breeding operation (CITES Notification No.453, 28 September 1987). There is a shortage of available food in northern Botswana and consequently most of the sales have been of live animals.

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | 360 | 165 | 24 | 64 | 613 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Captive breeding | C.nil | 1986 | 138 | 989 | 1124 | - |
| Eggs collected | C.nil | 1984 | 1081 | 1440 | 1087 | - |

Source of Information: Questionnaire; Anon., 1987b

## Limpopo Crocodile Farm

P.O. Box 5, Sherwood, Botswana

Manager: Roy Young
Date of Establishment: 01/01/88
Date of Census: 31/12/89
Total Area: 50 hectares (48 rearing ponds)
Food: Chicken/fish/red meat (venison) mixtures from poultry farms and suppliers

Hatchlings are purchased from other farms. Commercial production is anticipated in 1991.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 1100 | 1200 | - | - | 2300 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.nil | 1989 | - | - | 850 | - |

Source of Information: Questionnaire

## Okavango Swamps Crocodile Farm (Pty) Ltd

PR. Bag 47, Maun, Botswana

Manager: John J. Seaman
Date of Establishment: 01/01/82
Date of Census: 31/01/91
Total Area: 60 hectares (16 breeding ponds, 40 rearing ponds)
Food: Offal, fish, donkey, horse from abattoirs, rivers and farms

The breeding stock is kept in natural ponds. Registered captive-breeding operation (CITES Notification No.435, 13 March 1987). Hatchlings and juveniles are in environmentally controlled chambers supplied with heated water.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 1700 | 3200 | 21 | 87 | 5008 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | | C.nil | 1986 | 720 | 397 | 793- |
| Eggs collected | C.nil | 1984 | 1939 | 1270 | 1109 | 3000 |
| Skins produced | C.nil | 1987 | 50 | 94 | 61 | 600 |

Source of Information: Questionnaire; Anon., 1987a; Seaman pers. comm., 1989

Species present: *Caiman crocodilus*
*Caiman latirostris*
*Melanosuchus niger*
*Paleosuchus palpebrosus*
*Paleosuchus trigonatus*

CITES entered into force in Brazil on 4 November 1975.

Under *Portaria* No.3481 of *Lei* No.5197, *C. crocodilus* is an endangered species and may not be hunted in any ways. The 1967 *Lei* No.5197 prohibits hunting and trade in terrestrial wildlife with the exception of animals raised in registered captive-breeding facilities. This law also prohibits the export of raw reptile and amphibian skins. A recent revision of the regulations permits the export of *Caiman* skins produced from ranching operations. There is a restriction on the proportion of eggs that may be taken to stock ranches, a requirement that the animals be kept for at least six months before being sold and that 10% of the hatchlings should be returned to the wild (Resolution No.126, 13 February 1990).

In 1989, the Brazilian Government (IBAMA) had authorized a total of 17 *Caiman* farms, although many of these had not actually commenced operation (Z. Campos *in litt.*, 17 January 1991). One farm in Rio Grande do Sul had a stock of *Crocodylus niloticus* imported from Zimbabwe which was the subject of extensive investigation and controversy surrounding concern over their possible escape. There were said to be 26 registered farms for *C. latirostris* in São Paulo in March 1990 (Verdade, 1991).

The following farms had been approved by IBAMA but it is not known whether they are functioning yet (Campos *in litt.*, 1991):

## Agropecuaria São Bento do Parana Ltda

Fazenda Sarana-Flores, Rua IAS 930, Brasilia, Distrito Federal, Brazil

Species: *C. latirostris*

## Fazenda Ranchinho (Pedro Gomes MS)

Rua 13 de Maio 1459, Campo Grande, 79005 Mato Grosso, Brazil

Manager: J. Candina de Paula

Species: *C. crocodilus*

## Estrada Miranda-Duque Km04

R 13 de Junho 76, Miranda, 79380 Mato Grosso do Sul, Brazil

Manager: A. Dellamore

Species: *C. crocodilus*

## Fazenda dos Eucaliptos

Rua Gen. Camara 381,1, Andar Porto Alegre 90010 Rio Grande do Sul, Brazil

Manager: Flavio P. Soares

Species: *C. latirostris*

## Luiz Strumpf Ribeiro

Rua Jorge Fayet 305/09, Viamao, 94400 Rio Grande do Sul, Brazil

Manager: Luiz S. Ribeiro

Species: *C. latirostris*

## Yakult S/A Industria e Commercio

Rodovia Paranaiba-Costa Rica Km230, Paraiso, 79555 Mato Grosso do Sul, Brazil

Species: *C. crocodilus*

## Amazona Repteis Ltda

Travessa Marais e Barros 2351, Belem, Para, Brazil

Species: *C. crocodilus* and *M. niger*

## Name Unknown

Rua Prf. Jose H.M. Teixeira 538/171, Morumbi, São Paulo, Brazil

Species: *C. crocodilus*

## Fazenda Aguas Claras

Aurora 94, Santa Ifigenia, São Paulo, 01209 São Paulo, Brazil

Species: *C. crocodilus*

## Fazenda Monte Castello - Rochedo

Av Assis Brasil 91, Brooklin, S Paulo 04601 São Paulo, Brazil

Species: *C. crocodilus*

## Maro Agropecuaria Ltda

Francisco Tramontano 100/10, Morumbi, São Paulo, São Paulo, Brazil

Manager: Gerd V. Haenschild

Species: *C. crocodilus*

## Fazenda Varjao

Caixa Postal 398, Dourados, M.S. C.E.P. 798000 Mato Grosso do Sul, Brazil

Manager: Trajano Silva
Date of Establishment: 01/10/84
Date of Census: 31/12/89
Total Area: 2.5 hectares (1 breeding pond, 1 rearing pond)
Food: Horse meat from a supplier

Approved by IBAMA

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus yacare* | 320 | 520 | 15 | 40 | 895 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.cro | 1985 | - | - | - | - |
| Eggs collected | C.cro | 1986 | - | - | - | - |
| Hatchlings collected | C.cro | - | 63 | 289 | 320 | - |

Source of Information: Questionnaire; Campos *in litt.*, 1991

## Jacarelandia

Fazenda Olhos D'Agua, Rua 13 de Maio 1459, Campo Grande, Mato Grosso do Sul,

Manager: Elias V. L. Monteiro
Date of Establishment: 01/01/88
Date of Census: 26/07/90
Total Area: 265m$^2$ (22 breeding ponds, 28 rearing ponds)
Food: Red meat and offal from abattoir

The farm has not yet started commercial production, but an experimental cull of 14-month old caiman was taken in 1989.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus yacare* | 1230 | 918 | - | - | 2148 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.cro | 1988 | - | 263 | 1222 | 1556 |
| Skins produced | C.cro | - | - | - | 7 | - |

Source of Information: Questionnaire; Campos *in litt.*,1991

## Contaregis

Av Bahia 544, Porto Alegre, 90240 Rio Grande do Sul, Brazil

Manager: M. Denley
Date of Establishment: 04/08/89
Date of Census: 31/12/89

The crocodiles were bought from farms in Zimbabwe and were granted import permits by the Brazilian authorities. They have subsequently been the subject of much controversy owing to fears of their escaping and establishing a feral population. They are maintained in heated buildings with access to open-air enclosures in daylight hours.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | - | 15 | 95 | 110 |

Source of Information: Campos *in litt.*, 1990

## Maro Agropecuaria, Ltd.

Caxilha de Correo - 72, Intarare - SP, 18460 São Paulo, Brazil

Manager: Julio Rodriguez
Date of Establishment: 01/08/88
Date of Census: 01/08/88
Total Area: 30000m$^2$ (1 breeding pond)
Food: Pig meat from a pig farm

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus yacare* | - | - | 7 | 28 | 35 |

Source of Information: Questionnaire

Species present: *Crocodylus porosus*
*Crocodylus siamensis* ?

CITES entered into force in Brunei Darussalam on 20 August 1990.

Under the Wildlife Protection Enactment of 11 July 1978 all reptiles in wildlife sanctuaries are fully protected; hunting, capture and possession are prohibited. No protection, other than in wildlife sanctuaries, is mentioned elsewhere in the Enactment.

There are believed to be no commercial crocodile farms in Brunei Darussalam.

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

CITES entered into force in Burkina Faso on 15 January 1990.

All three species are protected under *Loi portant interdiction de la chasse à l'éléphant à l'hippopotame et au crocodile* of 1979. Total protection is given, possession and/or national trade in the species is prohibited. International trade is prohibited/regulated.

There are believed to be no commercial crocodile farms in Burkina Faso.

Species present: *Crocodylus porosus*
*Crocodylus siamensis*

Cambodia is not a Party to CITES.

There is no information on legislation affecting crocodiles in Cambodia

There are reported to be a number of small crocodile farms near Tonle Sap Lake, Kompong Chnag. One large farm was said to have 70 adult *C. siamensis* and to produce 1700 eggs a year. Large numbers of juvenile crocodiles are said to be exported each year to supply farms in Thailand (Dobbs, 1991).

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

CITES entered into force in Cameroon on 3 September 1981.

*C. niloticus* was transferred from CITES Appendix I to II on 1 August 1985 under the special criteria set out in Resolution Conf. 5.21 subject to annual quotas. The following quotas were agreed by the Conference of the Parties. The population was transferred to Appendix I in 1992.

| Annual quota | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|---|
| Wild | 20 | 100 | 100 | 100 | 0 | 0 | 0 |

The three species are partially protected under the *Arrêté fixant la liste des animaux des classes A, B, et C, la liste des espèces animales à chasser par type de permis ainsi que les latitudes d'abattage* of 29 July 1983. Under this Arrêté these species are partially protected and may not be killed or captured other than by holders of special hunting or sports permits. As protected animals, their hides and trophies may only be traded if a certificate of origin has been issued.

There are believed to be no commercial crocodile farms in Cameroon.

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

CITES entered into force in the Central African Republic on 25 November 1980.

The three species present are totally protected by *Ordonnance portant protection de la faune sauvage et réglementant l'exercice de la chasse* of 27 July 1984. Possession of and/or national trade in these species is prohibited. International trade is prohibited or regulated.

There are believed to be no commercial crocodile farms in the Central African Republic.

**Species present:** *Crocodylus cataphractus*
*Crocodylus niloticus*

**CITES entered into force in Chad on 1 July 1975.**

**No information on legislation is available.**

**There are believed to be no commercial crocodile farms in Chad.**

Species present: *Alligator sinensis*

CITES entered into force in China on 8 April 1981.

This species is listed in Conservation Class I under the Law of Wild Animals Protection of the People's Republic of China of 21 February 1989. Hunting and killing of this species are prohibited except for scientific, taming, breeding and exhibition purposes, when a special hunting permit must be obtained. Trade, imports and exports are forbidden except for the purposes listed above, in which case permission must be obtained from wildlife administrative units.

In the late 1970s, the Chinese Government started a programme aimed at preserving *A. sinensis* involving a captive-breeding operation at Anhui (ARCCAR) and subsequently, in 1986, a National Alligator Conservation Reserve in the surrounding areas of Anhui Province. A proposal was accepted at the 8th meeting of the Conference of the Parties to CITES to register this as a captive-breeding operation for the purpose of permitting international trade. A parallel project, the Yinjibian Village Farm Reserve, has been set up in Zhejiang Province (Webb and Vernon, 1992).

Several zoos in China have small populations of *A. sinensis*, but the bulk of the captive population is at Anhui.

## Anhui Research Centre of Chinese Alligator Reproduction

Xuancheng County, Anhui, China

Manager: Ding Jiren
Date of Establishment: 01/12/79
Date of Census: 31/12/89
Total Area: 1km$^2$/10 hectares (12 breeding ponds, 3 rearing ponds)
Food: Fish, duck, goose, rabbit, snails from paddy fields

A total of 171 alligators were collected from the wild between 1979 and 1981. Since then some eggs have been collected from the wild for incubation on the farm. The farm was established principally for conservation purposes and research has been carried out in collaboration with Anhui Normal University. In order to defray rising costs, it is intended to market hatchlings to private farms in the country with the eventual aim of marketing skins internationally. At present no plans are being made to reintroduce or restock the species. Webb and Vernon (1992) give the total in 1991 as 901.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *Alligator sinensis* | 1450 | 2152 | 12 | 63 | 3677 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A. sin | 1983 | 744 | 989 | 510 | 675 |

Source of Information: Questionnaire; Crocodile Action Plan, 1991; Webb and Vernon, 1992

## Yinjibian Village Farm Reserve

Yinjiabian Village, Changxing Township, Zhejiang Province

Manager: Luchang Ziu
Date of Establishment: 01/01/84
Date of Census: 31/12/91
Total Area: 122 hectares (breeding area ~ 0.67 hectares, 2 breeding ponds, series of raising ponds)

The Yinjiaban Protection Area was established and is operated by villagers, with some assistance from Zhejiang Provincial Bureau of Forestry. The original stock of four animals appear to have been the last animals in the wild in this region. The only sales of stock were 10 individuals supplied to the National Forest Park of Giandaohu (Thousand Island Lake).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *Alligator sinensis* | - | - | 1 | 2 | 118 |

Source of Information: Vernon, 1992; Webb and Vernon, 1992

Species present: *Caiman crocodilus*
*Crocodylus acutus*
*Crocodylus intermedius*
*Melanosuchus niger*
*Paleosuchus palpebrosus*
*Paleosuchus trigonatus*

CITES entered into force in Colombia on 29 November 1981.

*Decreto Ley* No.2811 of 1974 (Code of the Natural Renewable Resources and Protection to the Environment) together with *Decreto* No.1608 of 1978 only allow trade in species not banned, either from the wild or bred in captivity under special regulations. *C. acutus*, *C. intermedius* and *M. niger* are protected from hunting and export under *Decreto* No.1608, except for subsistence or captive-breeding purposes (earlier prohibitions remain in effect). *C. crocodilus* is prohibited from hunting and commercialization in the Orinoco Basin, except for subsistence purposes, under *Resolución* No.847 of 6 August 1973. This also sets a minimum size limit for *C. crocodilus* of 150cm in length for hunting and trade in areas where prohibitions are not in force. Since 1978, no commercial hunting permits have been issued for any crocodilian species in Colombia. A seasonal restriction is in force under this law for the Atlantic coast area from April to July. The Management Authority of Colombia has informed the CITES Secretariat of a certain amount of legally obtained pre-Convention skins when it became a Party to CITES. *C. crocodilus* captive breeding started in 1984 at some farms duly registered by the Colombian Management Authority. Each breeding facility to be established has to present a management plan and fill other requisites, after which it may obtain a licence for the "*Etapa Experimental*". After one year or more of satisfactory operation, the farm may receive a new licence for the "*Etapa Definitiva*" (commercial stage) for ten years providing additional legal requirements are met.

Exports are marked with security plastic strips (coded to show the species, identity of the farm, serial number of the specimen produced in each farm and the product type involved).

To increase the opportunities for the survival of the wild populations of *C. acutus*, *C. intermedius* and *M. niger*, research is being developed by INDERENA together with several breeding farms to develop technology for captive breeding. For these purposes, INDERENA has allowed the capture from the wild of limited numbers of these species (INDERENA, Resolution No. 0017/87) as "*Caza de Fomento*". It is hoped that these experimental captive-breeding operations will eventually become commercial in accordance with Colombian and CITES regulations. There is provision for certain animals to be made available to INDERENA for restocking (INDERENA *in litt.*, 1991). The Estacion de Biologia Tropical Roberto Franco, Villavicencio, has been trying to breed *C. intermedius* since 1976. The first successful breeding occurred in 1991 with the production of seven hatchlings (Ramirez, 1991).

## Arcila Vieira

Calle 66A No 35A 10, Medellin, Cordoba, Colombia

Manager: Alvaro Arcila Vieira

The farm is not authorized for commercial production and is still in the *"Fase Experimental"*. *Iguana iguana* is also held on the farm (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ---(1600)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Atlantics Reptiles

Calle 80 No.45-41, Barranquilla, Turbana, Atlantico, Colombia

Manager: Reina Mogollon

The farm is not authorized to produce or export skins of *Caiman crocodilus* and *Crocodylus acutus*; still in the *"Fase Experimental"* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | - | - | - |

Source of Information: DFTI, 1990 and 1991

## La Oculta

Cra 46 No 27-91, Medellin, Antioquia, Colombia

Manager: Luis F. Martinez

Since 1988 this farm has been authorized to produce 30,052 skins. Actual production of *C. crocodilus* was 8916 skins. It also produced 37,795 skins of *Iguana iguana*, which is held on the farm together with *Boa constrictor* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | - | - | - |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Agrozoocria Ltda.

Carrera 42 No.79-10 Apto.3A, Barranquilla, Repelon, Atlantico, Colombia

Manager: Pedro Nel Erazo

The farm is not authorized to produce or export skins of *Caiman crocodilus*; still in the *"Fase Experimental"* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1600)---- | | - |

Source of Information: DFTI, 1991

## Babilonia

Cra. 15 No.101-45, Bogota, Sabanalarga, Atlantico, Colombia

Manager: Jose Catalino Daza
Date of Establishment: 19/02/87

Since 1989 this farm has been authorized to produce 39,482 skins. Actual production of *C. crocodilus* skins was 19,336 skins (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(3000)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Crocodylia Colombiana

Cra 51B No.76-137, Barranquilla, Atlantico, Colombia

Manager: Rafael Fernandez
Date of Establishment: 13/10/88

Since 1990 this farm has been authorized to produce 66,016 skins. Actual production of *Caiman crocodilus* was 5800 skins. The farm is also authorized to produce and export *Iguana iguana* and *Boa constrictor* but is still in the *"Fase Experimental"* for *Crocodylus acutus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(4000)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## El Guarjaro

Avenida 3 No.70-200, Cartagena, Luruaco, Atlantico, Colombia

Manager: Oscar Ovidio Correa

The farm is not authorized for the commercial production or export of *Caiman crocodilus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Framkutay

Pablo VI Bloque C2, Apartamento 414, Bogota, Malambo, Atlantico, Colombia

Manager: Yataro Kuma

The farm is not authorized for the commercial production or export of any of the species held: *Caiman crocodilus*, *C. acutus* and *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Hermanos Medina

Cra 64 No.91-134 Apto 3A, Barranquilla, Polonuevo, Atlantico, Colombia

Manager: Jairo Medina

The farm is not authorized for the commercial production or export of *Caiman crocodilus*; also held is *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus fuscus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Inversiones Cure Rodger Ltda.

Carrera 40 No.43-95, Barranquilla, Palam de Varela, Atlantico, Colombia

Manager: Victor E. Maduro

The farm is not authorized for the commercial production or export of the species held: *Caiman crocodilus*, *C. acutus*, *Boa constrictor* and *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Kalamar Gator Farm

Carrera 52 No.69-96 Piso 5, Barranquilla, Santa Lucia, Atlantico, Colombia

Manager: Franklin Schuster

The farm is not authorized to produce or export skins of *Caiman crocodilus* or *Crocodylus acutus*; still in the *"Fase Experimental"*. The farm also holds *Boa constrictor* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1991

## Las Trinitarias

Calle 36 No.41-37, Ponedera, Atlantico, Colombia

Manager: William Paternostro

The farm is not authorized for the commercial production or export of *Caiman crocodilus*. Also held is *Tupinambis nigropunctatus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Roberto Lafaurie

Carrera 53 No.82-174 APTO 302, Barranquilla, Pondera, Atlantico, Colombia

Manager: Roberto Lafaurie

The farm is not authorized to produce or export skins of *Caiman crocodilus* and *Crocodylus acutus*; still in the *"Fase Experimental"* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1991

## Zooagro

Calle 80 No.55-81, Edificio Imperio, Barranquilla, Luruaco, Atlantico, Colombia

Manager: Jorge Fandino
The farm is not authorized for the commercial production or export of *Caiman crocodilus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(1300)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Zoocriadero del Caribe

Galapa, Atlantico, Colombia

Manager: Mario Varon Olarte

The farm is not authorized to produce or export skins of *Caiman crocodilus*; still in the *"Fase Experimental"*. The farm also holds *Iguana iguana* and *Boa constrictor* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1991

## Apropizoo

Carrera 64 No.91-134, Barranquilla, Archi, Bolivar, Colombia

Manager: Jairo Medina

The farm is not authorized for commercial production or export; it is still in the *"Fase Experimental"*. *Iguana iguana* and *Capybara (Hydrochaeris hydrochaeris)* are also held on the farm (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Bajo del Oso

Cra 54 No.74-106, Barranquilla, San Jacinto, Bolivar, Colombia

Manager: Rodolfo E. Donado
Date of Establishment: 08/05/88
Date of Census: 31/12/89
Total Area: 50 hectares (3 breeding ponds, 60 rearing ponds)
Food: Fish with vitamin and mineral supplements from local producers

Since 1989 this farm has been authorized to produce 8602 skins. Production of *C. crocodilus* to date is 8602 skins (INDERENA report for 1991). It also produced 11,811 *Iguana iguana* skins (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.crocodilus fuscus* | 8000 | 4000 | 500 | 1500 | 14000 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Captive breeding | C.cro | 1989 | - | - | 8000 | - |
| Skins produced | C.cro | 1991 | - | - | 8000 | - |

Source of Information: Questionnaire; DFTI, 1990 and 1991; PROEXPO, 1991

## Caribbean Reptiles Farm

Calle 60 No.35-09, Barranquilla, Arjona, Bolivar, Colombia

Manager: Gloria Siade Pedraza
Date of Census: 31/12/89

The farm is not authorized for commercial production or export of the species held; *Caiman crocodilus*, *Crocodylus acutus*, *Boa constrictor* and *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ---(2000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Bacol

Avenida Pedro de Heredia No.21-07, Arjona, Bolivar, Colombia

Manager: Humberto Gomez

The farm is not authorized for the commercial production or export of those species held: *Caiman crocodilus*, *C. acutus*, *Iguana iguana* and *Boa constrictor* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Bucaintu

Edificio Banco Popular Of 207, Cartagena, Bolivar, Colombia

Manager: Miguel Stambulie

Since 1988 this farm has been authorized to produce 13,600 skins. Actual production of *Caiman crocodilus* was 5701 skins. It also produced 54,529 *Iguana iguana* and 1506 *Boa constrictor skins* (INDERENA report for 1991).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## CEFA Ltda.

Carrera 42 D No.6-79, Barranquilla, Cartagena, Bolivar, Colombia

Manager: Leon Roiter

The farm is not authorized to produce or export skins of *Caiman crocodilus* and *Crocodylus acutus*; still in the *"Fase Experimental"*(INDERENA report for 1991).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1991

## Calatrava

Edificio Banco International, Officina 1106, Cartagena, Turbaco, Bolivar, Colombia

Manager: Fernando Araujo P.
Date of Establishment: 01/09/89
Date of Census: 01/04/90
Total Area: 25 hectares (9 breeding ponds, 1 rearing pond)
Food: Fish from Bahia de Cartagena

The farm is not authorized for the commercial production or export of *Caiman crocodilus* and is still in the *"Fase Experimental"*. According to INDERENA the farm has 3000 breeding stock (INDERENA report for 1991).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.crocodilus* | 315 | - | 11 | 34 | 360 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.cro | 1989 | - | - | 330 | - |

Source of Information: Questionnaire; DFTI, 1990 and 1991

## Colombian Croco Ltda.

Calle 7 No.12-43, El Banco, Barranco de Loba, Bolivar, Colombia

Manager: Eugenio Gutierrez

The farm is not authorized to produce or export skins of *Caiman crocodilus* or *Crocodylus acutus*; still in the *"Fase Experimental"*. The farm also holds *Boa constrictor* and *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1991

## El Iguanal

A.A. 875, Sincelejo, Zambrano, Bolivar, Colombia

Manager: Jaime de la Ossa

The farm is not authorized for the commercial production or export of the species held: *Caiman crocodilus*, *Crocodylus acutus*, *Iguana iguana* and *Tupinambis nigropunctatus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## El Paraiso

Avenida Pedro de Heredia No.33-07, Cartagena, San Nepomuceno, Bolivar, Colombia

Manager: Juan Carlos Lopez

The farm is not authorized for the commercial production or export of *Caiman crocodilus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Especies del Caribe

Segundo Callejon Trucco No.20A-25 La Popa, Cartagena, Bolivar, Colombia

Manager: Ivan Rueda Castillo
Date of Establishment: 29/08/88

Since 1989 this farm has been authorized to produce 32,084 skins. Actual production of *Caiman crocodilus* skins was 4000. It has also produced 17,000 skins of *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | - | - | - |
| *C.crocodilus* | - | - | ----(500)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Saurus Ltda.

Calle 27 No.24-40, Bogota, Turbaco, Bolivar, Colombia

Manager: Gabriel Rey Santos

The farm is not authorized for the commercial export or production of *Caiman crocodilus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(1200)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Zooal Ltda.

Calle 94 No.49 C30, Barranquilla, Calamar, Bolivar, Colombia

Manager: Roque Batista

The farm is not authorized to produce or export skins of *Caiman crocodilus*; still in the *"Fase Experimental"*. *Iguana iguana* is also held at the farm (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1991

## Zoocar

Avenida Jiminez No.18 B 21 Ofic. 202 Manga, Cartagena, Bolivar, Colombia

Manager: Jorge Lamprea
Date of Establishment: 13/04/88

Since 1989 this farm has been authorized to produce 5776 skins. Actual production of *Caiman crocodilus* was 4250 skins. It also produced 8651 skins of *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(900)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Zoofaucol

Calle 6, No.7-64, Cartagena, Turbaco, Bolivar, Colombia

Manager: Fernando Trujillo
Date of Establishment: 04/07/89
Date of Census: 31/12/89
Total Area: (4 breeding ponds, 14 rearing ponds)
Food: Meat and fish from slaughter-house, local market and own production

The farm is not authorized for the commercial production of the species held: *Caiman crocodilus*, *Iguana iguana*, *Boa constrictor*, *Dasyprocta punctata* and *Agouti paca*. The farm is still in the *"Fase Experimental"* and has a breeding stock of 300 *Caiman crocodilus* (INDERENA report for 1991).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.crocodilus* | 450 | - | 50 | 150 | 650 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.cro | 1989 | - | - | 522 | - |

Source of Information: Questionnaire; DFTI, 1990 and 1991

## Zoojuncal

Calle 30 A No.78-85, Santa Monica, Cartagena, Arjona, Bolivar, Colombia

Manager: Dora Luz de Trujillo

The farm is not authorized for the commercial production or export of species held: *Caiman crocodilus* and *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Zoorecol

20 Callejon Trucco, No.20A-25 La Popa, AA4186 Cartagena, Bolivar, Colombia

Manager: Fabio Rueda Gomez
Date of Establishment: 15/03/87
Date of Census: 31/12/89
Total Area: 120 hectares (20 breeding ponds, 110 rearing ponds)
Food: Fish from ponds and fishing boats

Since 1988 this farm has been authorized to produce 26,838 skins. Actual production of *Caiman crocodilus* was 26,374. It also produced 22,952 *Iguana iguana* skins (INDERENA report for 1991).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.crocodilus fuscus* | 19800 | 7700 | 1000 | 3000 | 31500 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.cro | 1987 | 4200 | 7700 | 19800 | - |
| Skins produced | C.cro | 1988 | - | 4000 | 7000 | - |

Source of Information: Questionnaire; DFTI, 1990 and 1991

## El Boral

Avenida 15 No.127 A 33 Apartamento 1808, Bogota, Orocue, Casanare, Colombia

Manager: Maria A. Pavia

The farm is not authorized for the commercial production and export of *Caiman crocodilus*. Capybara (*Hydrochaeris hydrochaeris*) is also held on the farm (INDERENA report for 1991).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## La Aurora

Avenida 15 No 129-51, Interior 8, Hato Corosal, Casanare, Colombia

Manager: Armando Barragan

Since 1988 this farm has been authorized to produce 5193 skins. Production of *Caiman crocodilus* skins to date has been 5193 skins. It has also produced 13,860 skins of Capybara (*Hydrochaeris hydrochaeris*) (INDERENA report for 1991).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.crocodilus* | - | - | ----(1174)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Promofauna

Carrera 44 No 20-51, Piso 3, Pazo de Ariporo, Casanare, Colombia

Manager: Angel Bravo Uribe

The farm is not authorized for the commercial production or export of *Caiman crocodilus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Zooguira Ltda.

Calle 145 No.19-41 Apto. 401, Bogota, Tauramena, Casanare, Colombia

Manager: Libia Vanegas

The farm is not authorized to produce or export skins of *Caiman crocodilus*; still in the *"Fase Experimental"*. The farm also holds *Tupinambis nigropunctatus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1991

## Agricola el Paraiso

Calle 51 No.35-28 of 506, Bucaramanga, Aguachica, Cesar, Colombia

Manager: Jorge Charry

The farm is not authorized to produce or export skins of *Caiman crocodilus*; still in the *"Fase Experimental"* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1991

## Manzanares

Cra 24 No 51-40, Bucaramanga, San Martin, Cesar, Colombia

Manager: Francisco Serrano
The farm is still in the *"Fase Experimental"* and is not authorized for commercial production of *Caiman crocodilus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1330)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Pedro de Jesus Ojeda

Carrera 98 No.114-35, Bogota, Lorica, Cordoba, Colombia

Manager: Pedro Jesus Ojeda

The farm is not authorized for commercial production of *Caiman crocodilus* or *C. acutus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Reptilia de Colombia

Calle 16 No.8-44, Barranquilla, Cordoba, Colombia

Manager: Reyna Mogollon
Date of Establishment: 04/02/88

Since 1989 this farm has been authorized to produce 20,953 skins. Actual production of *Caiman crocodilus* was 3610 skins (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(2500)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Colfauna

Transversal 37 No.28-29, Officina 201, Bogota, Cundinamarca, Colombia

Manager: Armando Florian

Since 1989 this farm has been authorized to produce 14,140 skins. Actual production of *Caiman crocodilus* was 8000. The farm also holds *Tupinambis nigropunctatus*, but is not authorized for commercial production or export of this species (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.crocodilus* | - | - | ----(4000)---- | | - | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Captive breeding | C.cro | - | - | - | 43064 | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Lirica

Calle 78 No.9-77 Of. 706, Bogota, Cundinamarca, Colombia

Manager: Felipe Ricaurte
Date of Establishment: 01/09/88
Date of Census: 31/12/89
Total Area: 80 hectares (2 breeding ponds, 10 rearing ponds)
Food: Horse meat and fish from the region

The farm is not authorized for the commercial production or export of *Caiman crocodilus* and *Crocodylus acutus*. It is still in the *"Fase Experimental"* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.acutus* | - | - | ----(10)---- | | - | |
| *C.crocodilus* | 450 | 50 | 50 | 150 | 700 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Captive breeding | C.cro | 1988 | - | 50 | 500 | - |

Source of Information: Questionnaire; DFTI, 1990 and 1991

## N. Sierra

Transversal 18A No.98-54, Bogota, Carmen de Apicala, Cundinamacra, Colombia

Manager: Nelly del Sierra

The farm is not authorized for the commercial production or export of the species held: *Caiman crocodilus* and *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(2500)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Pizano S.A.

Cra 9 No.74-08 Piso 9, Bogota, Cundinamarca, Colombia

Manager: Eduardo Pieschacon
Date of Establishment: 19/02/87
Date of Census: 31/12/89
Total Area: (21 breeding ponds, 5 rearing ponds)
Food: Beef and fish (*Oreochromis niloticus)* produced on the farm

Since 1988 this farm has been authorized to produce 3049 skins. Actual production of *Caiman crocodilus* was 2823 skins. However, it is still in *"Fase Experimental"* for *Crocodylus acutus* and cannot commercially produce or export this species (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.acutus* | 40 | 36 | 2 | 6 | 84 | |
| *C.crocodilus fuscus* | 2300 | 343 | 82 | 165 | 2890 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Captive breeding | C.acu | 1986 | 9 | 16 | 45 | - |
| | C.cro | 1986 | 309 | 1015 | 2300 | - |
| Skins produced | C.cro | 1989 | - | - | 964 | - |

Source of Information: Questionnaire; DFTI, 1990 and 1991

## Playa Rica

Calle 71 No.21-27, Bogota, Paratebueno, Cundinamarca, Colombia

Manager: Carlos Rivadeneira

The farm is not authorized for commercial production of *Caiman crocodilus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1333)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Tropi Saurus

Carrera 1 E No.79-38, Bogota, Puerto Salgar, Cundinamarca, Colombia

Manager: Alfonso Davila Ortiz

The farm is not authorized for the commercial production or export of any of the species held: *Caiman crocodilus* and *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Diaza y Cia

Cra 5 No.10-38 Of 503, Neiva, Palmero, Huila, Colombia

Manager: Gentil Diaz S.
Date of Establishment: 12/12/88

The farm is still in the *"Fase Experimental"* and is not authorized for commercial production (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Mauricio Ospina D.

Calle 86 No.9-77, Apto. 201, Bogota, Neiva, Huila, Colombia

Manager: Mauricio Ospina D.
Date of Establishment: 01/06/87
Date of Census: 01/08/90
Total Area: 16 hectares (3 breeding ponds, 40 rearing ponds)
Food: White and red meat: purchased from farms and horses bought locally

Since 1989 this farm has been authorized to produce 4587 skins. Actual production of *Caiman crocodilus* was 2250 skins. Information from the questionnaire showed that the farm sold 1500 skins in 1990. It also produced 4690 skins of *Iguana iguana*. This farm also holds *Boa constrictor* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | 9 | - | 4 | 10 | 23 |
| *C.crocodilus* | 3556 | 4587 | 165 | 420 | 8728 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.acu | - | - | - | - | - |
| | C.cro | - | - | 650 | 5300 | - |
| Skins produced | C.cro | 1990 | - | - | - | 1500 |

Source of Information: Questionnaire; DFTI, 1990 and 1991

## Colreptiles Ltda.

Calle 75 No.52-23, Barranquilla, Remolino, Magdalena, Colombia

Manager: Salvador Santos

The farm is not authorized for the commercial production or export of *Caiman crocodilus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Reptiles del Magdalena

Cra 3 No.17-27, Santa Marta, Aracatac, Magdalena, Colombia

Manager: Bernardo Maya
Date of Establishment: 19/04/89

Since 1989 this farm has been authorized to produce 7544 skins. Actual production of *Caiman crocodilus* was 2000 skins. It also produced 15,810 skins of *Iguana iguana* and 1877 skins of *Boa constrictor*. *C. acutus* is also held but the farm is not authorized to produce or export this species (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Agricola Manantial

Transversal 44 No.43-31, Bogota, San Martin, Meta, Colombia

Manager: Marta Diaz Criollo

The farm is not authorized to produce or export skins of *Caiman crocodilus*; still in *"Fase Experimental"*. The farm also holds *Boa constrictor* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1991

## Arangos Rudd

Calle 98 No.9-03 P. 2, Bogota, Villavicencio, Meta, Colombia

Manager: Alvaro Arango
Date of Establishment: 24/02/88

The farm is not authorized to produce or export *Caiman crocodilus*; it is still in *"Fase Experimental"* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(400)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Cafaos

Calle 77 No.15-80 of. 601, Bogota, Guamal, Meta, Colombia

Manager: Luis Miguel Ospina

The farm is not authorized to produce or export skins of *Caiman crocodilus*; still in the *"Fase Experimental"*. The farm also holds *Boa constrictor* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1991

## J.K.

Calle 126 No.9A 27, Bogota, Puerto Lopez, Meta, Colombia

Manager: Claus Jena

The farm is not authorized for commercial production or export of *Caiman crocodilus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(350)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Las Brisas

Carrera 8 No.69-43, Bogota, Meta, Colombia

Manager: Mauricio Herrera

The farm is not authorized to produce or export skins of *Caiman crocodilus*; still in the *"Fase Experimental"* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1333)---- | | - |

Source of Information: DFTI, 1991

## Montes Swanson

Cra 7 No.74-36 Piso 4, Bogota, San Carlos de Guarda, Meta, Colombia

Manager: Rafael Montes

The farm is not authorized for commercial production and is still in the *"Fase Experimental"* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(400)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Pierre Trussendi

Calle 98 No.9-03 Officina 904, Bogota, Puerto Gaitan, Meta, Colombia

Manager: Pierre Trussendi

The farm is not authorized for the commercial production of *Caiman crocodilus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1333)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Rodriguez Juliao

Diagonal 127 A No.13 A 05, Puerto Lopez, Meta, Colombia

Manager: German Rodriguez

The farm is not authorized to produce or export skins of *Caiman crocodilus*; still in the *"Fase Experimental"* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1333)---- | | - |

Source of Information: DFTI, 1991

## Villa Canaguaro

Km3 C'ta del Mar, Hacienda Canafistolo, AA3205 Villavicencia Meta, Colombia

Manager: Ricardo Villa
Date of Establishment: 01/02/88
Date of Census: 31/12/89
Total Area: 40 hectares (35 breeding ponds)
Food: Meat from farm

The farm is still in the *"Fase Experimental"* for *Crocodylus intermedius*. Since 1990 this farm has been authorized to produce 4900 skins. Production of *Caiman crocodilus* to date has been 4900 skins. It also produced 2100 skins of *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | 1184 | 4704 | 177 | 439 | 6504 |
| *C.intermedius* | - | - | ----(10)---- | | - |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.cro | - | - | - | 6597 | - |

Source of Information: Questionnaire; DFTI, 1990 and 1991

## Zoocriadero Santa Ana

Calle 38 No.32-88 EDF Parque Santander, Villavicencia, Meta, Colombia

Manager: Aniceto Torres Gutierrez
Date of Establishment: 01/06/89
Date of Census: 01/06/89
Total Area: 10 hectares (3 breeding ponds)
Food: Red meat and fish from local slaughter-house

The farm is still in the *"Fase Experimental"* and is not authorized for commercial production or export of *Caiman crocodilus*. The farm also holds *Boa constrictor* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | 130 | 270 | 400 |

Source of Information: Questionnaire; DFTI, 1990 and 1991; PROEXPO, 1991

## Buenaventura Ltda.

Cra 24 No.16-36, Sabana de Torres, Bucaramanga, Santander, Colombia

Manager: Antonio Vargas
Date of Establishment: 19/02/87

Since 1989 this farm has been authorized to produce 4000 skins. Production of *Caiman crocodilus* to date has been 4000 skins (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991; PROEXPO, 1991

## Fauna Tropical

Transversal 37 No.28-29, Bogota, San Marcos, Sucre, Colombia

Manager: Mary Quintero

The farm is not authorized for the commercial production or export of any of the species held: *Caiman crocodilus*, *C. acutus*, *Iguana iguana*, *Boa constrictor* and *Tupinambis nigropunctatus* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(2000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Granja del Caribe

Calle 23, No.19-3050, Officina 801, Sincelejo, Sucre, Colombia

Manager: Luis Oreste Barachi

The farm is not authorized for the commercial production of any of the species held: *Caiman crocodilus*, *C. acutus* and *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(10)---- | | - |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1990 and 1991

## Proesa Ltda.

Carrera 24 No.31-15, Corozal, Sucre, Colombia

Manager: Samuel Martelo

The farm is not authorized to produce or export skins of *Caiman crocodilus*; still in the *"Fase Experimental"*. The farm also holds *Iguana iguana* (INDERENA report for 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | ----(1000)---- | | - |

Source of Information: DFTI, 1991

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

CITES entered into force in Congo on 1 May 1980.

*C. niloticus* was transferred from CITES Appendix I to II on 1 August 1985, followed by *O. tetraspis* and *C. cataphractus* on 22 October 1987 under the special criteria set out in Resolution Conf. 5.21 subject to annual quotas. The following quotas were agreed by the Conference of the Parties. The populations of all three species were transferred back to Appendix I in 1992.

| Species | Annual quota (from wild) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
| *C. cataphractus* | 0 | 600 | 600 | 600 | 600 | 600 | 600 |
| *C. niloticus* | 1000 | 150 | 150 | 150 | 0 | 0 | 0 |
| *O. tetraspis* | 0 | 500 | 500 | 500 | 0 | 0 | 0 |

These species are partially protected under *Arrêté déterminant les animaux intégralement et partiellement protégés prévus par la loi 48/83 définissant les conditions de conservation et d'exploitation de la faune sauvage* of 21 April 1983 which establishes a minimum size limit for the taking of crocodiles intended for commercial purposes. This law "*fixant les différentes taxes prévues*" sets a fee for the taking of all three species, for the issuance of certificates of lawful possession and export permits for such animals or trophies thereof.

There are believed to be no commercial crocodile farms in Congo.

Species present: *Caiman crocodilus*
*Crocodylus acutus*

CITES entered into force in Costa Rica in 1975.

*Ley* No.6919 of 17 November 1983 and its implementing regulation *Decreto* No.15403 of 1984 continue the prohibition of commercial hunting and trade in wildlife and wildlife products, commercial exports only being allowed from captive-breeding programmes. Under *Ley* No.15895-MAG of 1985, endangered species of reptile, including *C. crocodilus* and *C. acutus*, can only be hunted and captured for purposes of biological investigation or for licensed captive-breeding facilities. Captive breeding may only take place if 30% of the offspring are returned to the wild (*Decreto Art.*12).

There are believed to be no commercial crocodile farms in Costa Rica.

Species present: *Crocodylus niloticus*
*Crocodylus cataphractus*
*Osteolaemus tetraspis*

Côte d'Ivoire is not a Party to CITES

In 1974 a general hunting ban was established under *Arrêté* No.003/SEPN/CAB (CAP, 991).

There are no commercial crocodile farms in Côte d'Ivoire, but a crocodile breeding project has been running in Abidjan Zoo since 1981. This started with two pairs each of *C. cataphractus* and *C. niloticus* from which some 50 *C. cataphractus* and at least 18 *C. niloticus* have been bred. There is also a collection of 12 adult *Osteolaemus tetraspis* (Waitkuwait, 1990).

Species present: *Caiman crocodilus* (Introduced)
*Crocodylus acutus*
*Crocodylus rhombifer*

CITES entered into force in Cuba on 19 July 1990.

The capture of all species of crocodilian is prohibited under Decree No.103 (1982). Commercial crocodile hunting has been prohibited since 1967 (Targarona, 1989).

Management of crocodiles is under the control of the *Ministerio de la Industria Pesquera* (MIP). There are currently five farms, the oldest of which was established about 1959. The MIP manages one farm, while the remaining four are managed by the *Empresa Nacional para la Protección de la Flora y la Fauna* (ENPFF) under a cooperative arrangement with MIP. There are plans for a further two farms at Nuevitas and Zapata Swamp. The farm at Tasajera listed in the first edition of the Crocodilian farming directory was closed in 1980 (Ottenwalder, in press).

## Centro de Cria de Cocodrilos

Laguna del Tesoro, Zapata Swamp, Cuba

Manager: MIP
Date of Establishment: 01/01/59
Date of Census: 01/08/88
Total Area: 13 hectares (3 breeding ponds, many rearing ponds)
Food: Fish for juveniles; fish and slaughter-house scraps for adults.

The farm initially built up a large hybrid stock of up to 15,000 adults in 1965, but serious attempts were made to eliminate them from 1974 onwards. A very large cull of hybrids was taken in 1976-77 followed by others until 1980. The pure breeding stock of *C. rhombifer* was isolated at that time. The total founder stock of *C. rhombifer* taken from the wild was probably no more than about 1000. Commercial production of pure *C. rhombifer* skins is now increasing but all are sold within Cuba. Meat is also sold locally. This facility is also an important tourist attraction, receiving an estimated 17,000 visitors annually (Thorbjarnarson, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(15)---- | | 15 |
| *C.rhombifer* | - | - | ----(1500)---- | | 10000 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.rho | - | - | 7000 | - | - |
| Skins produced | C.rho | - | 300 | 500 | - | - |

Source of Information: Ottenwalder, in press; Taragona, 1989

## Isla de Juventud

Lanier Swamp, Cayo Portrero, Cuba

Manager: ENPFF
Date of Establishment: 01/01/86
Date of Census: 01/08/88
Total Area: (Fenced natural swamp)

Dedicated to breeding *C. rhombifer* for eventual reintroduction to Lanier Swamp. The original stock was obtained from Habana Zoo.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.rhombifer* | - | 234 | 5 | 30 | 269 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.rho | 1987 | 234 | - | - | - |

Source of Information: Ottenwalder, in press

## Birama

Birama Swamp, Granma Province, Cuba

Manager: ENPFF
Date of Establishment: 01/01/89
Date of Census: 01/08/88

Under construction in 1988. Intended to collect hatchling *C. acutus* from the wild with the eventual aim of establishing a breeding stock.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.acutus* | - | - | - | - | - |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.acu | 1989 | - | - | - | - |

Source of Information: Ottenwalder, in press

## Jobabito

Jobabo, Birama Swamp, Las Tunas Province, Cuba

Manager: ENPFF
Date of Establishment: 01/01/88
Date of Census: 01/08/88

Currently relies on *C. acutus* obtained as hatchlings from the wild, but hopes eventually to establish a breeding population.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.acutus* | - | 650 | - | - | 650 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.acu | 1988 | - | 650 | - | - |

Source of Information: Ottenwalder, in press

## Sabanalamar

Cheve Lagoon, Playa Bailen, Pinar del Rio, Cuba

Manager: ENPFF
Date of Establishment: 01/01/86
Date of Census: 01/08/88

The original stock was collected from the wild. Nests are dug in the sand shores of the pens.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.acutus* | - | 115 | 15 | 35 | 165 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.acu | 1987 | 115 | - | - | - |

Source of Information: Ottenwalder, in press

**Species present:** *Caiman crocodilus*
*Crocodylus acutus*
*Melanosuchus niger*
*Paleosuchus palperbrosus*
*Paleosuchus trigonatus*

CITES entered into force in Ecuador on 1 July 1975.

In 1980, a commercial hunting ban for all reptiles came into force under *Decreto* No.487. Under *Ley* No.74 of 14 August 1981, *Artículo* 47 specifically prohibits the export of all indigenous species except for scientific or educational purposes. *Artículo* 146 authorizes exports of wildlife populations which have reached a size that will affect ecological balance, and exports of those species which have been maintained in captive or semi-captive conditions. Although confusing, Ecuador's legislation does not presently allow any commercial export of wildlife.

There are believed to be no commercial crocodile farms in Ecuador.

**Species present:** *Crocodylus niloticus*

**CITES entered into force in Egypt on 4 April 1978.**

**This species is fully protected under Decree 1059 of 1984.**

**There are believed to be no commercial crocodile farms in Egypt.**

**Species present:** *Caiman crocodilus*
*Crocodylus acutus*

**CITES entered into force in El Salvador on 29 July 1987.**

**No information on legislation available**

**There are believed to be no commercial crocodile farms in El Salvador.**

**Species present:** *Crocodylus cataphractus*
*Crocodylus niloticus*

**Equatorial Guinea is not a Party to CITES.**

**No information on legislation available.**

**There are believed to be no commercial crocodile farms in Equatorial Guinea.**

Species present: *Crocodylus niloticus*

CITES entered into force in Ethiopia on 4 July 1989.

*C. niloticus* was transferred from CITES Appendix I to II on 1 August 1985 under the special criteria set out in Resolution Conf. 5.21 subject to annual quotas. The following quotas were agreed by the Conference of the Parties. At the 8th meeting of the Conference of the Parties to CITES (1992) the population was retained in Appendix II under the conditions of Resolution Conf. 3.15 on ranching.

| Annual quota | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|
| Wild | 0 | 20 | 20 | 20 |
| Ranched | 0 | 9300* | 8800* | 8800* |

* = including 2500 live hatchlings

Young and female crocodiles are fully protected under the Wildlife Conservation Regulations of 19 January 1972; other specimens may, however, be taken under a Supplementary Game Licence, which is not available to taxidermists, dealers or trappers. A non-returnable capitation fee must be paid in advance of taking any animal. Trade in game animals and trophies derived thereof may only take place under a Dealer's Licence (valid for one year). Importations may take place only if proof of lawful exportation can be shown to a Customs officer. Exportations may take place upon presentation of a Certificate of Lawful Possession, and under the conditions of an export permit.

There is only one commercial farm in Ethiopia.

## Arba Minch Crocodile Farm

PO. Box, Arba Minch, Ethiopia

Date of Establishment: 01/01/84
Date of Census: 31/12/90
Total Area: 3 hectares (134 rearing ponds)
Food: Whole fish from nearby lakes and cattle meat from the local market

The farm was established by the Wildlife Conservation Department. Until 1986 eggs were collected from the wild and incubated on the farm using charcoal heaters. From 1987 a new method was adopted whereby wild nests were located and guarded by watchmen until hatching. Stock has been released in Lakes Beseka, Chamo and Abaya.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 2080 | 6474 | - | - | 8554 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.nil | 1985 | - | - | - | - |
| Hatchlings collected | C.nil | 1987 | 2500 | 2587 | 6000 | 7140 |
| Skins produced | C.nil | 1990 | - | - | - | 2089 |

Source of Information: Questionnaire; Anon., 1991e; Hailu, 1990

France has been a Party to CITES since 18 May 1978.

There is at least one crocodile farm in France operating principally as a tourist facility. Two further farms have applied for permission to import Nile Crocodiles, one near Nice on the Côte d'Azur, but it is not known whether they have yet commenced operation (Reptel Madagascar, 1991).

## La Serre aux Crocos (Zoo de Pierrelatte)

26700 Pierrelatte Drôme, France

Manager: Luc Fougeirol
Date of Census: 31/08/91
Total Area: (2 breeding ponds)
Food: Chicken offal

The facility is heated and comprises a series of display ponds with some educational facilities. The crocodiles were said to have been bought in Southern Africa, although there is said to be at least one caiman from French Guiana.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | - | - | - | 300 |

Source of Information: Anon., 1991i; Walmsley *in litt.*, 1991

Species present: *Caiman crocodilus*
*Melanosuchus niger*
*Paleosuchus palpebrosus*
*Paleosuchus trigonatus*

As an Overseas Department of France, French Guiana has been subject to CITES regulations since 18 May 1978.

Decree Art.1 of the *Arrêté* of 15 May 1986 - Reptiles and Amphibians prohibits throughout the national territory the destruction or taking of eggs, and the destruction, capture, taxidermy, transport, use, purchase or sale of *M. niger*. Decree Art.2 of the *Arrêté* prohibits throughout the national territory the taxidermy, transport, purchase or sale of *P. palpebrosus* and *P. trigonatus* but not their export. Decree Art.3 of the *Arrêté* partially protects *C. crocodilus*: it prohibits, throughout French Guiana, taxidermy, use, purchase or sale as well as their transport, use, purchase or sale elsewhere in French territory unless legally imported or introduced.

There are believed to be no commercial crocodile farms in French Guiana.

**Species present:** *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

CITES entered into force in Gabon on 15 May 1989.

Crocodiles were not mentioned in the Wildlife Act of 1960. In 1981 a temporary ban on hunting was proclaimed by decree. A new act was adopted in 1982.

There was said to be one small facility holding 17 crocodiles (possibly *C. cataphractus*) 40km north of Libreville in 1987. This was still in existence in 1989 but its current status is unknown (De Meulenaer *in litt.*, 1991).

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

CITES entered into force in Gambia on 24 November 1977.

These species are totally protected under the Wildlife Conservation Act of 14 February 1977. Hunting and commercial trade is prohibited. Sale of wild animals, their meat or trophies is also prohibited. Imports and exports are only permitted for scientific purposes.

There are believed to be no commercial crocodile farms in Gambia.

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

CITES entered into force in Ghana on 12 February 1976.

These species are totally protected in Ghana under the Wildlife Conservation Regulations of 3 April 1971. They are listed in the schedule and may not be hunted, captured or destroyed. Exportation of any animal (living or dead) and any hides or skins in commercial quantities is strictly prohibited unless a valid permit, issued by the Chief Game and Wildlife Officer, is held in accordance with regulations.

There are believed to be no commercial crocodile farms in Ghana.

Species present: *Caiman crocodilus*
*Crocodylus acutus*
*Crocodylus moreletii*

Guatemala became a Party to CITES on 2 May 1979.

Hunting and export of *C. moreletii* is prohibited under *Ley General de Caza* 1970. In December 1986, at the request of the CITES Secretariat, Guatemala established a ban on all wildlife exports, effective from 28 February 1987, to allow a quota system to be developed (Notification No.386). The ban was lifted on 1 October 1987, and quotas have been established in collaboration with the Secretariat. On 26 September 1988 a temporary suspension of all hunting, capture, local trade, export and re-export of wild fauna came into effect under *Acuerdo de la Dirección* DG-0009-88 (CITES Notification No.510).

There are currently two experimental farms in Guatemala.

## Serre Menegazzo & Zelada Tock

Apartado Postal No.19, Iztapa, Escuintla, Guatemala

Manager: C.E. Serre Menegazzo and E.H. Zelada Tock
Food: Fish and some red meat

This operation is only at an experimental stage

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | 10 | 4 | - | - | 14 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.cro | 1990 | - | - | 4 | 10 |

Source of Information: Gonzalez *in litt.*, 1991

## Departmento de Vida Silvestre y Areas

7a Avenida 6-80, Zona 13, Cuidad, Guatemala

Manager: W.L. de la Roca Alfaro & B.B. Aragon Castilla de Rendon
Date of Establishment: 01/11/87
Date of Census: 31/07/91
Total Area: (2 rearing ponds)
Food: Freshwater fish from local river and own fish project

This is an experimental farm which was established with a consignment of live caimans confiscated in Europe and donated to the Government of Guatemala.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus fuscus* | - | 171 | - | - | 171 |

Source of Information: Gonzalez *in litt.*, 1991

Species present: *Crocodylus niloticus*
*Osteolaemus tetraspis*
and possibly
*Crocodylus cataphractus*

CITES entered into force in Guinea-Bissau on 14 August, 1990.

Under the *Regulamento de Caza* of 1980, hunting crocodiles for sport is prohibited, but apparently commercial hunting is authorized.

There are believed to be no commercial crocodile farms in Guinea-Bissau.

Species present: *Caiman crocodilus*
*Crocodylus intermedius*
*Melanosuchus niger*
*Paleosuchus palpebrosus*
*Paleosuchus trigonatus*

CITES entered into force in Guyana on 25 August 1977.

The Fisheries Regulations of 1966 required fisheries officers to issue licences for capture, collection, removal or slaughter of *C. crocodilus*, then listed as game. The Wildlife Division of the Ministry of Agriculture is drafting new legislation on the 'Conservation of Wildlife'. *M. niger* is included in Guyana's Fisheries legislation, and the hunting and export of this species are regulated by the use of permits issued by the Management Authority of the Ministry of Agriculture. A temporary ban on the export of wildlife was imposed in December 1986 pending the establishment of a quota system which took effect in October 1987 (CITES Notification 457, 29 October 1987). A survey of Guyana's Caiman resources was carried out, under the auspices of the CITES Secretariat, in 1989. Since then there has been a suspension of trade in the exportation of hatchlings of *C. crocodilus*, *C. Palbebrosus* and *P. trigonatus* for the pet trade.

| Export quotas | 1987 | 1988 | 1989 | 1990 | 1991 |
|---|---|---|---|---|---|
| C. crocodilus | 30,000 [1] | 60,000 [1] | | 16,000 [4] | 12,500 [3] |
| P. palpebrosus | 120 [2] | 240 [2] | | | 0 |
| P. trigonatus | 180 [2] | 360 [2] | | | 0 |

[1] Hatchlings and skins
[2] Hatchlings only
[3] Skins only
[4] In 1990, whole skins and parts representing a total of approximately 16,000 skins collected before the second quarter of 1989 were tagged in preparation for export.

There is currently only one caiman farm in Guyana.

## Nested Ltd. Caiman Farm

Land of Canaan E.B.D. P.O Box 12258, Guyana

Manager: Eduardo Uruena
Date of Establishment: 01/01/88
Date of Census: 31/12/89
Total Area: 80 acres (32.37ha), (4 breeding ponds, 10 rearing ponds)
Food: Chicken offal, fish offal, beef offal and shrimp heads

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.crocodilus* | 433 | 985 | 210 | 458 | 2086 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| **Captive breeding** | C.cro | 1989 | - | - | 168 | - |
| **Hatchlings collected** | C.cro | 1988 | - | 1200 | 521 | - |

**Source of Information:** Questionnaire

Species present: *Caiman crocodilus*
*Crocodylus acutus*

CITES entered into force in Honduras in March 1985, although it had passed a law to ratify the Convention in 1978 (*Acuerdo* No.16, 20 June 1978).

Under *Decreto Ley* No.771 (24 and 25 September 1979), the *Dirección General de Recursos Naturales Renovables* (DIGERNARE) can establish quotas for or prohibit all commercial trade and export of wildlife. There are no quotas for *Caiman* and *Crocodylus spp.* In Notification No.425 of 13 March 1987, the Secretariat informed the Parties that Honduras had lifted the ban on exports of *C. crocodilus fuscus*. By *Resolución* No.006-88 of 16 March 1988 the Government of Honduras imposed another one-year ban on hunting, national and international commercialization of live specimens, skins and products or derivatives (see also Notification No.480 of 24 May 1988).

A proposal submitted to the 8th meeting of the Conference of the Parties to CITES to register the first captive-breeding operation for *Crocodylus acutus* was withdrawn.

There are three crocodile farms in Honduras.

## Agropecuario de Colon SA

Apartado Postale No.6, Tegucigalpa, DC, Trujillo, Honduras

Manager: Adolfo Midence Soto
Date of Establishment: 01/09/85
Date of Census: 31/12/87
Total Area: Several hectares (Natural fenced pond of 1.5ha, concrete ponds)
Food: Offal from cattle slaughterhouse

The stock for the farm was collected from nearby rivers, primarily the Aguan and Chapagua. At least 74 breeding adults, several sub-adults and three pods of hatchlings have been collected.

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.acutus* | - | 900 | 10 | 64 | 974 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Captive breeding | C.acu | 1987 | - | - | - | 560 |
| Hatchlings collected | C.acu | 1987 | - | - | - | - |

Source of Information: King *et al.*, 1990; Meza *in litt.*, 1991; Midence, 1990

## CCC La Sierra

San Manue, Honduras, Central America, Honduras

Manager: Eric G. Fernandez
Date of Establishment: 01/02/89
Date of Census: 15/09/91
Total Area: 50 hectares (141 breeding ponds, 15 concrete rearing ponds)
Food: Horse meat, cattle and waste chicken.

The farm is a joint venture between Banco Continental (Honduras) and Clal Crocodile Farms. Breeding stock was collected from the northern waterways but the original target of 1200 adults had to be abandoned because of a shortage of wild animals. Controlled environment roundhouses are planned for rearing the juveniles.
Apart from animals bred on the farm in 1990 and 1991 all of the remaining adults were taken from the wild.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | 615 | 803 | 24 | 82 | 1524 |

| | Spp. | 1st | 1987 | 1989 | 1990 | 1991 |
|---|---|---|---|---|---|---|
| Captive breeding | C.acu | 1989 | - | 22 | 53 | 615 |

Source of Information: Questionnaire; Fernandez and Espinal, 1991; King *et al.*, 1990

## Grupo Ganadero Industrial

Choluteca, Honduras

Date of Establishment: 01/06/89
Date of Census: 31/12/89
Total Area: (22 breeding ponds)

About 90 adult crocodiles were captured from near Trujillo in 1989 although 30 died shortly afterwards owing to trauma and inadequate husbandry.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | - | - | ----(60)---- | | 60 |

Source of Information: King *et al.*, 1990; Meza *in litt.*, 1991

Species present: *Crocodylus palustris*
*Crocodylus porosus*
*Gavialis gangeticus*

CITES entered into force in India on 18 October 1976.

*C. palustris*, *C. porosus* and *G. gangeticus* are fully protected under the Wildlife Protection Act, 1972. The hunting of these species is strictly prohibited. Import and export is controlled by the Wildlife Endangered Species (Import and Export) Bill, 1984. Under this Bill exports are prohibited unless valid licences for scientific, educational and wildlife conservation purposes have been issued and an import permit from the country of destination has been obtained. Shipping must be carried out with minimal risk of injury.

There are a number of crocodile breeding centres in India initiated under a Government management programme aimed at rehabilitation and reintroduction. Choudhury (1990) listed 40 breeding/rearing stations, holding some 20,000-22,000 crocodilians, and reported that they had been so successful in breeding that they were running short of suitable locations for reintroduction. There have so far been no moves to produce skins for commercial purposes. The Madras Crocodile Bank operates as a conservation and research centre.

**Captive breeding or rearing schemes for crocodiles in India (Choudhury, 1990).**

| Location | Province | *G. gangeticus* | *C. porosus* | *C. palustris* |
|---|---|---|---|---|
| Port Blair | Andaman Nicobar | X | | |
| Warangal | Andhra Pradesh | | | X |
| Nagarjuna Sagar | Andhra Pradesh | | | X |
| Vishakpatnam | Andhra Pradesh | X | X | X |
| Hyderabad | Andhra Pradesh | X | X | X |
| Gauhati | Assam | X | | |
| Mutta | Bihar | | | X |
| Goa | Goa Daman & Diu | | | X |
| Junagarh | Gujarat | | | X |
| Sasan | Gujarat | | | X |
| Barodha | Gujarat | | | X |
| Gandhinagar | Gujarat | | | X |
| Ahmedabad | Gujarat | | | X |
| Kurukhestra | Haryana | | | X |
| Mudunmalai | Karnataka | | | |
| Mysore | Karnataka | X | | X |
| Bannangata | Karnataka | X | | |
| Neyyar | Kerala | | | X |
| Peruvannamuzhy | Kerala | | | X |

| Location | Province | *G. gangeticus* | *C. porosus* | *C. palustris* |
|---|---|---|---|---|
| Bhopal | Madhya Pradesh | X | | |
| Morena | Madhya Pradesh | X | | X |
| Sholapur | Maharashtra | | | X |
| Bombay | Maharashtra | | | X |
| Tadoba | Maharashtra | | | X |
| Chandigarh | Nicobar Punjab | | | X |
| Tikarpada | Orissa | X | | X |
| Daangmal | Orissa | | X | |
| Similipal | Orissa | | | X |
| Nandankanan | Orissa | X | X | X |
| Jodhpur | Rajasthan | | | X |
| Jaipur | Rajasthan | | | X |
| Kota | Rajasthan | X | | X |
| Hoggenakal | Tamil Nadu | | | |
| Amravati | Tamil Nadu | | | X |
| Madras | Tamil Nadu | X | X | X |
| Sathnur | Tamil Nadu | | X | X |
| Delhi | Uttar Pradesh | | | X |
| Katrenia ghat | Uttar Pradesh | | | |
| Lucknow | Uttar Pradesh | X | X | X |
| Bhagbatpur | West Bengal | | X | |

## The Madras Crocodile Bank Trust

Vadanemmeli Village, Perur P.O., Mahabalipuram Road, Chingle Tamilnadu, India

Manager: Romulus Whitaker
Date of Establishment: 01/01/78
Date of Census: 31/12/89

The Crocodile Bank was set up as an offshoot of the Madras Snake Park with help from WWF to rehabilitate wild populations of crocodiles. In the period 1976-1986, 476 *C. palustris* were supplied to state projects for restocking. It is planned to supply 500 *C. palustris* to Pakistan for release. The bank is now financially self-sufficient from visitor fees.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | - | ----( 1)---- | | 1 |
| *C.crocodilus* | - | 211 | ----(20)---- | | 239 |
| *C.moreletti* | - | 10 | - | - | 10 |
| *C.niloticus* | - | 4 | - | - | 4 |
| *C.palustris* | - | 2542 | ----(300)---- | | 2842 |
| *C.porosus* | - | 149 | ----( 5)---- | | 154 |
| *C.siamensis* | - | - | ----( 4)---- | | 4 |
| *G.gangeticus* | - | 5 | ----(14)---- | | 19 |
| *O.tetraspis* | - | - | ----( 4)---- | | 4 |
| *T.schlegelli* | - | 5 | - | - | 5 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.cro | 1982 | 75 | 100 | 67218 | |
| | C.mor | 1990 | - | - | - | 20 |
| | C.pal | 1976 | - | - | - | 3241 |
| | C.por | 1983 | 5 | 47 | 46 | ? |
| | C.sia | 1991 | - | - | - | - |

Source of Information: Questionnaire; Andrews 1990 and 1991; Whitaker, 1984 and 1991

Species present: *Crocodylus novaeguineae*
*Crocodylus porosus*
*Crocodylus siamensis*
*Tomistoma schlegelii*

CITES entered into force in Indonesia on 28 March 1979.

The Indonesian population of *C. porosus* was transferred to CITES Appendix II in 1985 under the special criteria defined in Resolution Conf 5.21, subject to the following quotas. Application has been made to the 8th meeting of the Conference of the Parties to CITES (1992) to retain the population in Appendix II under the conditions of Resolution Conf. 3.15 on ranching.

| Annual Quota | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|---|---|---|
| Wild | 2000 | 2000 | 2000 | 4000 | 4000 | 3000 | 3000 | 2700 | 1500 | 1500 |
| Ranched | | | | | | 2000 | 3000 | 7000 | 7000 | 7000 |

*C. novaeguineae*, *C. siamensis* and *T. schlegelii* are protected under Fauna Regulation No.327, 1978. *C. porosus* is protected under the Fauna Regulations of 1980. Under the Fauna Regulations, *C. novaeguineae* can be traded or exported only under exceptional circumstances with permission of the Ministry of Agriculture. Although *C. novaeguineae* is in CITES Appendix II, a quota of 20,000 skins a year was adopted in 1988. This was increased to 25,000 in 1991. The actual numbers of skins exported have been as follows (Anon., 1992b).

| Species | Skin exports | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|
| *C.porosus* | wild | ? | ? | 2297 | 1773 |
| | ranched | 824 | 2069 | 470 | - |
| *C.novaeguineae* | wild | ? | ? | 12608 | 16472 |
| | ranched | 1125 | 7579 | 2255 | - |

There are 36 commercial farms in Indonesia.

## PT Margomulyo

Yogyakata, Central Java, Indonesia

Listed by Anon. (1991a) but not by ICCTF (1992).

## Desa Makroman

Kecamatan Anggana, Kabupaten Kutai, Samarinda, East Kalimantan, Indonesia
Office address: Jl. Pluit Barat 1/27 Jakarta

Manager: Suprijadi Kusumo
Date of Establishment: 09/10/86
Date of Census: 01/03/90
Total Area: 20km² (2 breeding ponds, 16 rearing ponds)
Food: Fish from suppliers

The farm is owned by Makmur Abadi Permai, a major skin trading company, and is located beside a large tannery. The stock has been collected from the wild in E. Kalimantan since 1984 under permits issued by the local PHPA office. Commercial production of skins has not yet started but there was heavy mortality in 1988 which resulted in some skin production in that year. An annual report dated 16/10/89 gave a stock of 1732 *C. porosus* younger than one year, 1127 of 1-4 years and 20 of five years and above. The increase in stock by March 1990 presumably results from adults newly collected from the wild. Information from a CITES proposal gave total stock of *C. porosus* as 2924. The average annual skin production from 1989 to 1991 was 107 skins of *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | 25 | 2563 | 72 | 244 | 2904 |
| *T.schlegelii* | - | - | - | - | 12 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1988 | - | 724 | 32 | - |
| Hatchlings collected | C.por | 1986 | - | 1671 | - | - |
| Skins produced | C.por | - | - | 270 | - | - |

Source of Information: Questionnaire; Anon., 1991a; ICCTF, 1992; Luxmoore pers. comm., 1989; Webb and Jenkins, 1991a

## PT Harapan Kaltim Utama

Jln Jos Sudarso 54, Tarakan, East Kalimantan, Indonesia

Manager: Heru Kusuma Ongko
Date of Establishment: 01/03/86
Date of Census: 03/01/90
Total Area: (2 breeding ponds, 20 rearing ponds)
Food: Fish from suppliers

Animals have been collected from the wild since 1982, and so the date of establishment given as 1986 presumably refers to the granting of a permit. ICCTF (1992) gave the total stock of *C. porosus* as 2266. The average annual skin production from 1989 to 1991 was 459 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | 450 | 1516 | 76 | 224 | 2266 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.por | 1982 | 550 | - | 1000 | - |
| Skins produced | C.por | 1989 | - | - | 450 | - |

Source of Information: Questionnaire; ICCTF, 1992

## CV Surya Raya

Desa Trintit Balikpapan, East Kalimantan, Indonesia
Office address: Jl. Mayjen. Sutoyo No.11, Balikpapan, East Kalimantan

Manager: Tarto Sugiarto

ICCTF (1992) gave the total stock of *C. porosus* as 752 and *C. siamensis* as 9. The average annual skin production from 1989 to 1991 was 12 skins of *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | - | - | - | - | 580 |
| *C.siamensis* | - | - | - | - | 4 |

Source of Information: Anon., 1991a; ICCTF, 1992; Webb and Jenkins, 1991a

## PT Alam Murni Bahana

Desa Malanu, Sorong, Irian Jaya, Indonesia
Office address: Jl. Jelambar IV/8-A, Jakarta

Manager: Harja Cahyadi, Surya Chandra

ICCTF (1992) gave the total stock for *C. novaeguineae* as 4062 and *C. porosus* as 1058. The average annual skin production from 1989 to 1991 was 516 *C. novaeguineae* and 53 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | 3853 |
| *C.porosus* | - | - | - | - | 966 |

Source of Information: Anon., 1991a; ICCTF, 1992

## CV Bintang Mas

Jl. Jend. A. Yani No.47, Jayapura, Irian Jaya, Indonesia

Manager: Billy Gan
Date of Establishment: 01/01/78
Date of Census: 01/04/90
Total Area: 200km$^2$ (55 rearing ponds)
Food: Fish caught by their own shrimp boat

Previously operated as "Skyline Raya" (till 1986). Information obtained from a list of licensed crocodile farms gave the total stock of *C. porosus* as 3500 and *C. novaeguineae* as 17,045 (Anon., 1991a). ICCTF (1992) gave the total stock of *C. porosus* as 1717 and *C. novaeguineae* as 21,320. The average annual production of skins from 1989 to 1991 was 1251 *C. novaeguineae* and 47 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | 11250 | - | - | 11250 |
| *C.porosus* | - | 1000 | 50 | 200 | 1250 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.nov | - | - | 120 | - | - |
| | C.por | 1988 | - | - | - | - |
| Hatchlings collected | C.nov | - | 1500 | 2000 | 3500 | - |
| | C.por | 1978 | 500 | 300 | 300 | - |
| Skins produced | C.nov | - | 250 | - | 450 | - |
| | C.por | 1984 | - | - | - | - |

Source of Information: Questionnaire; Anon., 1991a; ICCTF, 1992

## CV Dwi Tunggal

Jl. Sudirman Serui, Irian Jaya, Indonesia
Manager: Darminto

ICCTF (1992) gave the total stock as 350 each for *C. novaeguineae* and *C. porosus*.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | 350 |
| *C.porosus* | - | - | - | - | 350 |

Source of Information: Anon., 1991a; Cox *in litt.*, 1990; ICCTF, 1992

## FA Fajar Baru

Jl. Sagawin No.42, Sorong, Irian Jaya, Indonesia

Manager: M. Rusdi

ICCTF (1992) gave the total stock for *C. novaeguineae* as 1005 and *C. porosus* as 252. The average annual production of skins from 1989 to 1991 was 112 *C. novaeguineae* and 24 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | 1407 |
| *C.porosus* | - | - | - | - | 359 |

Source of Information: Anon., 1991a; ICCTF, 1992

## PT Inhutani II

Sentani, Jayapura District, Irian Jaya, Indonesia
Office address: Jl. Gatot Subroto, Manggala. Wanabakti Blok IV LT.V, Jakarta

Manager: Ir. Moch. Haerani

ICCTF (1992) gave the total stock for *C. novaeguineae* as 2412 and *C. porosus* as 117. The average annual production of skins from 1989 to 1991 was 104 *C. novaeguineae* and 9 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | 1791 |
| *C.porosus* | - | - | - | - | 223 |

Source of Information: Anon., 1991a; ICCTF, 1992

## PT Jaya Abadi

Jl. Raya Mandala No.51, Merauke District, Irian Jaya, Indonesia

Manager: Leo Khoe Yang
Date of Establishment: 01/01/87
Date of Census: 31/12/89
Total Area: 2 hectares (21 rearing ponds)
Food: Fish, deer, beef, from suppliers

This farm is said to have taken over P.T.Tri Naga Kreasi, listed by Anon. (1991a). ICCTF (1992) gave the total stock of *C. porosus* and *C. novaeguineae* as 1000 each.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | 380 | - | - | 380 |
| *C.porosus* | - | 250 | - | - | 250 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.nov | - | - | - | 380 | - |
| | C.por | - | - | - | 250 | - |

Source of Information: Questionnaire; ICCTF, 1992

## CV Kaltim Indah Raya

Merauke, Irian Jaya, Indonesia
Office address: Jl. Yos Sudarso No.23, Samarinda, East Kalimatan

Manager: Suwito Makampo

Although this company has previously exported skins, as far as can be ascertained it currently has no farm. It may be the farm listed in the Indonesian draft CITES Proposal (Anon., 1991a) as Sumber Karya, as the two companies are closely linked. ICCTF (1992) gave the total stock of *C. novaeguineae* as 1010 and *C. porosus* as zero.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | 950 |
| *C.porosus* | - | - | - | - | 1333 |

Source of Information: Anon., 1991a; Cox *in litt.*, 1990; ICCTF, 1992

## FA Modan Baru

Jl. Raja Ampat No.172, Kampung Baru, Sorong, Irian Jaya, Indonesia

Manager: Kristantus Tandri
Date of Establishment: 19/12/85
Date of Census: 31/12/89
Total Area: 36,832m² (22 breeding ponds, 19 rearing ponds)
Food: Fish from market or fishing company

ICCTF (1992) gave the total stock of *C. novaeguineae* as 112 and *C. porosus* as 700. The average annual production of skins from 1989 to 1991 was 16 *C. novaeguineae* and 17 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | 90 | 2 | 2 | 94 |
| *C.porosus* | - | 612 | 20 | 20 | 652 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1990 | - | - | - | - |
| Hatchlings collected | C.nov | 1972 | 7 | 12 | 62 | - |
| | C.por | 1972 | 43 | 57 | 351 | - |

Source of Information: Questionnaire; Anon., 1991a; ICCTF, 1992

## CV Nikmat

Jl. Menaara Lampu I, Merauke, Irian Jaya, Indonesia

Manager: Sukami Supu

ICCTF (1992) gave the total stock of *C. novaeguineae* as 245 and *C. porosus* as 470. The average annual production of skins from 1989 to 1991 was 79 *C. novaeguineae* and 10 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | 245 |
| *C.porosus* | - | - | - | - | 470 |

Source of Information: Anon., 1991a; Cox *in litt.*, 1990; ICCTF, 1992

## Pengembagan Penangkaran Satwa Buaya IJ

Jl. Pemuda No.40, Sorong, Irian Jaya, Indonesia

Manager: Ir. M. Purba
Date of Establishment: 01/04/87
Date of Census: 31/12/90
Total Area: (20 breeding ponds, 20 rearing ponds)
Food: Salt-water fish from fishermen and commercial suppliers

The farm is run by the Sorong Government with assistance from PHPA and FAO. Hatchlings from egg harvests are reared in environmentally controlled chambers. Most are supplied to a network of supervised farms. Information obtained from a list of licensed crocodile farms in a draft proposal to CITES 1991 gave total stock of *C. novaeguineae* as 1957, and *C. porosus* as 277. The average annual production of skins from 1989 to 1991 was 45 *C. novaeguineae* and 5 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | 1368 | - | - | 1368 |
| *C.porosus* | - | 271 | 7 | - | 278 |
| *T.schlegelii* | - | - | - | - | - |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.nov | 1989 | - | - | 478 | 497 |
| | C.por | 1989 | - | - | - | 22 |
| Hatchlings collected | C.nov | - | - | 463 | 369 | - |
| | C.por | 1987 | - | 210 | 169 | - |
| | T.sch | - | - | - | - | |
| Skins produced | C.por | 1990 | - | - | - | - |

Source of Information: Questionnaire; Anon., 1991a; ICCTF, 1992

## PT Prakarsa Desain Utama

Arso, Irian Jaya, Indonesia
Office address: Jl. Jend. Sudirman Kav. 36, Wisma Benhill Lt.3, Jakarta

Manager: Poppy Dharsono

ICCTF (1992) gave the total stock of *C. novaeguineae* as 458 and *C. porosus* as 27. The average annual production of skins from 1989 to 1991 was 15 *C. novaeguineae* and 1 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | 400 |

Source of Information: Anon., 1991a; ICCTF, 1992

## PT Reptilindo Ekapratama

Jl. Sukarelawati No.21, Jayapura, Irian Jaya, Indonesia

Manager: Ir. Halil Nasution
Date of Establishment: 01/07/87
Date of Census: 31/12/89
Total Area: (4 breeding ponds, 54 rearing ponds)
Food: Fish caught locally or bought from market

Formerly known as CV Bintang Diai. The same company owns a farm in Nabiri. ICCTF (1992) gave the total stock of *C. novaeguineae* as 3801 and *C. porosus* as 567. The average annual production of skins from 1989 to 1991 was 1407 *C. novaeguineae* and 97 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | 10504 | 5 | 25 | 10534 |
| *C.porosus* | - | 771 | 1 | 4 | 776 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.nov | - | 1350 | 6300 | 9000 | - |
| | C.por | - | 150 | 700 | 1000 | - |
| Skins produced | C.nov | 1988 | - | 2221 | 5669 | - |
| | C.por | 1988 | - | 240 | 198 | - |

Source of Information: Questionnaire; Anon., 1991a; ICCTF, 1992; Webb and Jenkins, 1991a

## CV Ridha

Kompl. Dasar Oyehe, PO. Box 27, Nabire, Irian Jaya, Indonesia

Manager: Husain Machmud
Date of Establishment: 02/04/87
Date of Census: 31/03/90
Total Area: 2 hectares (22 rearing ponds)
Food: Fish from Oyehe Fish Market, Nabire

This farm is now a subsidiary of PT Reptilindo Ekapratama. ICCTF (1992) gave the total stock of *C. porosus* as 287 and *C. novaeguineae* as 2193. The average annual production of skins from 1989 to 1991 was 39 *C. novaeguineae* and 8 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | 3858 | - | - | - | 3858 |
| *C.porosus* | 201 | - | - | - | 201 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.nov | 1988 | - | 1321 | 2075 | - |
| | C.por | 1988 | - | 80 | 107 | - |

Source of Information: Questionnaire; ICCTF, 1992; Webb and Jenkins, 1991a

## PT Sentani Valley

Jl. Minangkabau I, Kemiri, Sentani, Jayapura, Irian Jaya, Indonesia

Manager: Tazir Saleh
Date of Census: 18/12/90
Total Area: 10.5 hectares (3 breeding pond, 19 rearing ponds)
Food: Trash fish (sometimes frozen) from P.T. Minanang Pura Maya Jayapura

The same company has a second registered farm address at Jl. Raya Krooy Kaimana Fak Fak, Irian Jaya. ICCTF (1992) gave the total stock for *C. novaeguineae* as 2079 and *C. porosus* as 197. The average annual production of skins from 1989 to 1991 was 104 *C. novaeguineae* and 10 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | 490 | 52 | 46 | 15 | 602 |
| *C.porosus* | 146 | 22 | 10 | 3 | 194 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.nov | 1989 | - | - | 459 | - |
| | C.por | 1989 | - | - | 49 | - |
| Skins produced | C.nov | - | - | - | 650 | - |
| | C.por | - | - | - | 50 | - |

Source of Information: Questionnaire; Cox pers. comm., 1990; ICCTF, 1992

## CV Sikoway Jaya

Doyo Jayapura, Irian Jaya, Indonesia
Office address: Jl. Sayur Lilin No.23 Jayapura, Irian Jaya

Manager: Lukas Maniagasi

ICCTF (1992) gave the total stock of *C. porosus* as 24 and *C. novaeguineae* as 84. The average annual production of skins from 1989 to 1991 was 6 *C. novaeguineae* and 2 *C. porosus* (ICCTF, 1992).

Source of Information: Anon., 1991a; Cox *in litt.*, 1990: ICCTF, 1992

## PT Timur Sakti Abadi

Merauke, Irian Jaya, Indonesia
Office address: Jl. Kyai Caringin No.29/31, Wisma Abadi Lt III, Jakarta.

Manager: Ir. Surjanto Pakoewibowo
Date of Census: 01/01/92

ICCTF (1992) gave the total stock of *C. porosus* as 5530 and *C. novaeguineae* as 734. The average annual production of skins from 1989 to 1991 was 213 *C. novaeguineae* and 63 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | 5530 |
| *C.porosus* | - | - | - | - | 734 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.nov | 1989 | - | - | - | 6170 |
| | C.por | 1989 | - | - | - | 924 |

Source of Information: Anon., 1991a; ICCTF, 1992

## Suli Citra Maluku P.T.

Jalan Sedap Malam No.51, Ambon, Maluku, Indonesia

Manager: Y. Y. Gonijaya
Date of Census: 01/01/92

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | 87 |

Source of Information: ICCTF, 1992

## CV Leo Jaya

Jombong Rawa Lele, Ciputet, Jakarta, West Java, Indonesia
Office address: Jl. Tanjung Duren Barat I/II, Tomang Barat, Jakarta

Manager: Leonardo Laloan
Date of Census: 08/12/90
Total Area: (4 breeding pens, 42 rearing pens)
Food: *c.* 60% snake meat from skin dealers; pig offal, rats and road kills; prawns for juveniles.

All the rearing stock is *C. porosus*, most of which are juveniles and were said to be obtained from collectors in Kalimantan and Sumatra when about 70cm total length. Several years ago eight *C. novaeguineae* yearlings were stocked, but all of these subsequently died. One *Tomistoma schlegelii* of about 1.5m total length (sex unknown) is also reared, this being the lone survivor of six transported when 70-80cm in length from a collector in Palembang, Sumatra. During 1988-89 nine clutches of *C. porosus* were laid, but none hatched. During 1990, 48 hatchlings were finally produced. Vitamin B complex is administered by injection to hatchlings and sick crocodiles. ICCTF (1992) gave the total stock for *C. porosus* as 269 and *T. schlegelii* as one. The average annual production of skins from 1989 to 1991 was 9 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | 40 | 90 | 17 | 84 | 231 |
| *T.schlegelii* | - | - | - | - | 1 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1990 | - | - | - | 62 |

Source of Information: Anon., 1991a; Cox pers comm., 1990; ICCTF, 1992; Webb and Jenkins, 1991a

## CV Ramlie

Jl. Karet Raya No.9, Jakarta Pusat, West Java, Indonesia

Manager: H. Ramlie
Date of Establishment: 01/01/85
Date of Census: 31/12/89
Total Area: (7 rearing ponds)
Food: Mainly fish from local market

The facility in Jakarta comprises a few small pens in a yard behind the premises of a skin trading company. There is also a small facility in Biak, Irian Jaya, where the animals are also said to be in poor condition. ICCTF (1992) gave the total stock for *C. novaeguineae* as 37 and *C. porosus* as 16. The average annual production of skins from 1989 to 1991 was 2 *C. novaeguineae* and 1 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | 26 |
| *C.porosus* | - | - | - | - | 26 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nov | - | - | - | - | - |
| | C.por | - | - | - | - | - |
| Eggs collected | C.nov | - | - | - | - | - |
| | C.por | - | - | - | - | - |
| Skins produced | C.por | 1985 | - | - | 100 | - |

Source of Information: Questionnaire; Cox *in litt.*, 1990; ICCTF, 1992

## Perhutani Perum

Blanakan, Purwakarta, Jawa, Barat, West Java, Indonesia

Manager: Ir. Sugeng Sukarto
Date of Establishment: 23/11/89
Date of Census: 01/01/90
Total Area: (16 rearing ponds)
Food: Fish from suppliers

This farm was established as a demonstration project by the parastatal company, PT Inhutani II, which is concerned with commercial production from forestry and wildlife enterprises. Information obtained from a list of licensed crocodile farms in a draft proposal to CITES (Anon., 1991a) gave a total stock of *C. porosus* as 94 and no data for *C. novaeguineae*. This farm is also known as Pt. Inhutani II. Main Office: Jalan Gatot Subrito, Manggala Wanabakati Blok IV LT. IV, Jakarta.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.novaeguineae* | - | 80 | - | - | 80 |
| *C.porosus* | - | 2 | - | - | 2 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.nov | 1989 | - | - | 88 | - |
| | C.por | 1989 | - | - | 3 | - |

Source of Information: Questionnaire; Anon., 1991a; ICCTF, 1992

## Taman Buaya Indonesia Jaya

Jl. Bandengan Utara No.27 West Jakarta 11240, West Java, Indonesia

Manager: Lukman Arifin
Date of Establishment: 08/09/76
Date of Census: 31/12/89
Total Area: 1500m$^2$ (5 breeding ponds, 5 rearing ponds)
Food: Chicken and fish: chicken from Pd. Pelita Agung Chicken Farm, fish from Jakarta

Taman Buaya has two farms near Jakarta: one is orientated towards tourists and the other is attached to a tannery at Pluit, Jakarta. It has no visitor facilities but when visited in 1990 was reported to have a large number of crocodiles awaiting slaughter. Not included in a list of licensed crocodile farms in a draft proposal to CITES 1991. ICCTF (1992) gave the total stock number of *T. schlegelii* and *C. novaeguineae* combined as 194 and no data for *C. porosus*.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.novaeguineae* | - | - | 8 | 15 | 23 |
| *C.porosus* | 71 | 68 | 141 | 183 | 463 |
| *T.schlegelii* | - | 1 | 25 | 44 | 70 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1976 | 28 | 25 | 18 | - |
| Skins produced | C.por | 1982 | 3 | 2 | 2 | - |

Source of Information: Questionnaire; ICCTF, 1992; Lilley pers. comm., 1990

## Desa Asam Kumbang U.D.

Jl. Pasar Lima No.59, Asam Kumbang, Medan, North Sumatra, Indonesia

Manager: Tham Muk
Date of Establishment: 01/01/59
Date of Census: 01/12/89
Total Area: 2 hectares (1 large mud pond, 42 concrete ponds)
Food: Chicken waste, shrimps and snake meat purchased locally

The oldest farm in Indonesia, also known as Pt Alan Murni Bahanag, and run by a farm of the same name as the latter in Sorong. All stock was obtained from the wild in Sumatra but none is said to have been obtained since 1975. Breeding has been carried out successfully since 1979 and supplies all current needs. The broodstock, maintained in a large semi-natural pond, is said to produce some 1000-2000 eggs a year but not all of the offspring can be accommodated in the farm. A licence to produce skins was finally granted in 1989. The average annual production of skins from 1989 to 1991 was 7 *C. porosus* (ICCTF, 1992). A total stock of 4062 *C. novaeguineae* and 1058 *C. porosus* was also recorded by ICCTF (1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | 96 | 293 | 100 | 300 | 789 |
| *T.schlegelii* | - | 4 | ----( 2)---- | | 6 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1979 | - | 100 | - | - |

Source of Information: Anon., 1991a; ICCTF, 1992; Luxmoore pers. comm., 1989

## PT Sinar Gunungmas Jaya

Simpang Gambus, Medan, North Sumatra, Indonesia
Main Office: Jl. Amplas No.1-4A, Simpang Gambus, Medan, 20214 North Sumatra

Manager: Alian Ruswan
Date of Establishment: 01/01/78
Date of Census: 31/12/89
Total Area: (1 breeding pond, 12 rearing ponds)
Food: Chicken waste from nearby poultry farms

The farm, formerly known as CV Bintang Sakti, is located 110km south of Medan at Simpang Gabus, Kecamatan Limapuluh. The breeding stock is kept in a semi-natural pond surrounded by concrete nesting compartments. All were said to have been collected in Sumatra. Hatchlings are reared initially in the company's premises in Medan. ICCTF (1992) gave the total stock for *C. porosus* as 355. The average annual production of skins from 1989 to 1991 was 115 *C. porosus* (ICCTF, 1992).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.porosus* | 89 | 252 | 15 | 63 | 419 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | - | 150 | 180 | 220 | - |
| Skins produced | C.por | 1989 | - | - | 140 | - |

Source of Information: Questionnaire; Anon., 1991a; ICCTF, 1992

## PT Yasanda

Binjai, North Sumatra, Indonesia
Office address: Jl. Riau No.1C Medan, North Sumatra

Manager: Sungko Riyanto
Date of Census: 01/01/92

The company has been exporting reptile skins for several years under the name of Perintis Tani.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.porosus* | - | - | - | - | 34 |
| *T.schlegelii* | - | - | - | - | 4 |

Source of Information: Anon., 1991a; ICCTF, 1992

## Pt. Bina Tangkar Perdana

Bulan Island, Batam, Riau, Indonesia
Office address: Jl. Jend., Sudirman Kav. 70-71, Wisma Indocement Lt. 13, Jakarta.

Manager: Karyadi
Date of Establishment: 28/09/89
Date of Census: 01/11/90
Total Area: 40 hectares (45 rearing ponds)
Food: Waste meat and offal from the island pig farm

This farm is owned by the same company as the other farm on Batam: Salim Group, Wisma Indocement 19th floor, Jl. Jend., Sudirman Kav. 70-71, Jakarta. The stock was all obtained in 1990. ICCTF (1992) gave the total stock for *C. novaeguineae* as 114 and *C. porosus* as 36. The average annual production of skins from 1989 to 1991 was 1 *C. novaeguineae* and 1 *C. porosus* (ICCTF, 1992).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.novaeguineae* | 1268 | - | - | - | 1268 |
| *C.porosus* | 172 | - | - | - | 172 |

Source of Information: Questionnaire; Anon., 1991a; ICCTF, 1992

## Pt. Perkasa Jagat Karunia

Bulan Island, Batam, Riau, Indonesia
Office address: Jl. Jend., Sudirman Kav. 22-23 BCA Building, Jakarta

Parent Company office: Wisma Indocement XIth floor, Jl. Jend., Sudirman Kav 70-71, Jakarta.

Manager: Angky Handoko
Date of Establishment: 28/05/88
Date of Census: 31/12/89
Total Area: 40 hectares (1 breeding pond, 40 rearing ponds)
Food: Waste meat and offal from the island pig farm

Following the introduction of new regulations in Singapore to ban pig farming, an offshore operation was set up on Batam Island. This produces an excess of waste meat which the crocodile farm can make use of. It is estimated that there is sufficient to support a total stock of 30,000 crocodiles. The original breeding stock was obtained from a farm in East Kalimantan. ICCTF (1992) gave the total stock of *C. novaeguineae* as 8307 and *C. porosus* as 1952. The average annual production of skins from 1989 to 1991 was 107 *C. novaeguineae* and 32 *C. porosus* (ICCTF, 1992).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.novaeguineae* | 520 | - | - | - | 520 |
| *C.porosus* | 550 | - | 104 | 311 | 965 |

Source of Information: Questionnaire; Cox, 1990; ICCTF, 1992; Webb and Jenkins, 1991a

## PT. Alas Watu Utama

Jl. A. Yani Km29 Banjarbaru, South Kalimantan, Indonesia
Office address: Jl. Abdul Muis 40/26, Jakarta

Manager: Ronny Pattimahu
Date of Establishment: 02/01/89
Date of Census: 31/12/89

Total Area: 5270m$^2$ (51 rearing ponds)
Food: Chicken, goat, sheep and shrimp from veterinary unit on the same company

The facility was originally built as a fish farm and comprises a number of small covered concrete tanks. It already contained crocodiles in November 1988, and so the date of establishment, given as January 1989, presumably refers to the granting of a permit. ICCTF (1992) gave the total stock for *C. porosus* as 204 and no data for *T. schlegelii*. The average annual production of skins from 1989 to 1991 was 10 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | - | 147 | - | - | 147 |
| *T.schlegelii* | - | 9 | - | - | 9 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.por | 1989 | - | - | 192 | - |
| | T.sch | 1989 | - | - | 8 | - |

Source of Information: Questionnaire; Anon., 1991a; ICCTF, 1992; Luxmoore, pers. comm.

## CV Sumber Daya Alam

South Kalimantan, South Kalimantan, Indonesia

No further information. FAO project personnel are checking whether this farm exists.

Source of Information: Cox *in litt.*, 1990

## PD Budiman

Jl. 16 ILIR No.289 Palembang, South Sumatra, Indonesia

Manager: Hasan
Date of Establishment: 13/04/89
Date of Census: 31/12/89
Total Area: 2.5 acres (1.01ha), (2 breeding ponds, 16 rearing ponds)
Food: Snake, crustaceans and frog

A site inspection in January 1990 showed an estimated stock of 150 *C. porosus* and 58 *T. schlegelii*. It is not clear why this should differ so greatly from the stock recorded in the questionnaire.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.porosus* | - | 970 | 10 | 20 | 1000 |
| *T.schlegelii* | - | 235 | 5 | 10 | 250 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.por | - | - | - | 250 | - |
| | T.sch | - | - | - | 250 | - |

Source of Information: Questionnaire; Cox, 1990; ICCTF, 1992

## CV Stock Borsuma Co. Ltd.

Km 6.5 reg No.51, Jl. Kol Barlian or Jl. Kartini No.4-A, Palembang, South Sumatra

Manager: Thalibsjah
Date of Establishment: 02/01/90
Date of Census: 02/01/90
Total Area: 5 hectares (1 breeding pond, 6 rearing ponds)
Food: Duck, fish, snake, mouse, rat and shrimp

The farm is split between two sites: a small (0.5ha) collection of covered pens at Jl. Kartini and an extensive new facility at Punti Kayu, opened in 1990. The stock listed as "breeding stock" actually represents the entire farm stock, probably less than 10% of which are mature. PHPA records indicate stocks of 352 in June 1986, 941 in December 1986 and 565 in December 1987. All of the original crocodiles are said to have been taken from the wild in South Sumatra. A total of 61 *C. porosus* were released in Way Kambas National Park (Lampung) in 1987 and 1988. ICCTF (1992) gave the total stock of *C. porosus* as 500 and *T. schlegelli* plus *C. siamensis* as 45. The average annual production of skins from 1989 to 1991 was 7 *C. porosus* (ICCTF, 1992).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.porosus* | - | - | 200 | 300 | 500 |
| *T.schlegelii* | - | - | 20 | 25 | 45 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.por | 1970 | 300 | 300 | 300 | - |
| | T.sch | 1970 | - | - | 45 | - |
| Skins produced | C.por | - | 300 | 310 | - | - |

Source of Information: Questionnaire; ICCTF, 1992; PHPA pers. comm., 1989

## CV Sumber Karya

Pacelekang, Bontomarannu District, Gowa Regency, South Sulawesi, Indonesia
Office address: Jl. Banda No.52, Ujung Pandang, Sulawesi

Manager: Sucipto
Date of Establishment: 02/04/87
Date of Census: 31/12/89
Total Area: 4 hectares (1 breeding ponds, 21 rearing ponds)
Food: Pork and fish from nearby farm and market

The data supplied by the farm do not indicate the source of the skins exported. There is evidence from elsewhere that considerable numbers of skins have been purchased from Irian Jaya and re-exported by the company. Information obtained from a list of licensed crocodile farms in a draft proposal to CITES 1991 gave a total stock of *C. porosus* as 1333 and *C. novaeguineae* as 950. The average annual production of skins from 1989 to 1991 was 399 *C. novaeguineae* and 27 *C. porosus* (ICCTF, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | 5 | 20 | 25 |
| *C.porosus* | - | - | 7 | 24 | 31 |
| *T.schlegelii* | - | - | - | - | - |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.nov | - | - | - | 625 | - |
| | C.por | - | - | - | 1382 | - |
| | T.sch | - | - | - | - | - |
| Skins produced | C.nov | 1989 | - | - | 311 | - |
| | C.por | - | - | - | 402 | - |

Source of Information: Questionnaire; Anon., 1991a; ICCTF, 1992; PHPA pers. comm., 1989

## CV Pembangunan Jaya

Jl. Gajah Mada No.11-12 Pontianak, West Kalimantan, Indonesia

Manager: Aliman Muchtar
Date of Census: 01/01/92

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | - | - | - | - | 120 |

Source of Information: Anon., 1991a; Cox *in litt.*, 1990; ICCTF, 1992

**Species present:** *Crocodylus palustris*

CITES entered into force in Iran on 1 October 1976.

*C. palustris* is protected under the Game and Fish Act (1967). The penalty for its unlawful hunting is set at $8242. The small remaining population is threatened by illegal cross-border hunting near the frontier with Pakistan (Department of the Environment, 1989).

There are believed to be no commercial crocodile farms in Iran.

CITES entered into force in Israel on 17 March 1980. It has no extant species of crocodilians.

There are three crocodile farms in Israel, one of which is registered as a captive-breeding operation.

## Fazael Crocodile Farm

Jerico Valley, 00635, Israel

Manager: Dotan Ami
Date of Establishment: 01/09/87
Date of Census: 31/10/91
Total Area: (16 breeding ponds, 1 rearing pond)
Food: Fish and meat/dead animals and offal

Registered captive-breeding programme (CITES Notification No.652, 28 August 1991). The initial stock was collected from the Tana River in Kenya in 1987. The farm intends to produce 11,250 skins over the period 1992-1996 (Anon., 1991j).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 650 | - | 21 | 102 | 773 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1988 | - | - | 50 | 300 |

Source of Information: Questionnaire; Anon., 1991j; Perry *in litt.*, 1991

## Gan-Shmuel Crocodile Farm

Kibbutz Gan-Shmuel, Mobile Post Hefer 33110, Israel

Manager: Shaul Rosenthal
Date of Establishment: 01/11/84
Date of Census: 31/10/91

Registered captive-breeding operation (CITES Notification No.488, 1 July 1988). Stock obtained from farms in Zimbabwe and Kenya (Anon., 1990b).

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | 1670 | 250 | 30 | 160 | 2110 | |
| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
| Captive breeding | C.nil | 1987 | - | - | - | 200 |
| Skins produced | C.nil | - | - | 200 | 500 | 800 |

Source of Information: Anon., 1988b and 1990b; Perry *in litt.*, 1991

## Hammat Gader Alligator Farm

Hammat Gader Hot Springs, 12480, Israel

Manager: Paul Rapport
Date of Establishment: 01/01/81
Date of Census: 31/12/89
Total Area: (1 breeding pond, 12 rearing ponds)
Food: Chicken from slaughter-house

The initial stock of 120 *Alligator mississippiensis* was obtained from farms in Florida in 1981.

Source of Information: Questionnaire

Species present: *Crocodylus acutus*

Jamaica is not a Party to CITES.

Legally protected under the Wildlife Protection Act of 1945 (CAP, 1991).

There are no commercial crocodile farms on Jamaica, but one farm was planned in 1990. Another tourist facility at Montego Bay is believed to have about 50 *Crocodylus acutus* and there is a private collection of about 30 animals (Ottenwalder *in litt.*, 14 November 1990).

## Crocodylus acutus Farm & Research Centre

259 Spanish Town Road, P.O. Box 200, 11 Kingston, Jamaica

Manager: Elma Shelley
Total Area: 12 acres (4.86ha)
Food: Fish and chicken from Aquaculture Ltd. and Jamaica Broilers Ltd.

Farm not yet established but awaits approval from the Natural Resources and Conservation Department. It is proposed to keep *Crocodylus acutus*.

Source of Information: Shelley *in litt.*, 1990

Species present: *Crocodylus niloticus*

CITES entered into force in Kenya on 13 March 1979.

*C. niloticus* was transferred from CITES Appendix I to II on 1 August 1985 under the special criteria set out in Resolution Conf. 5.21 subject to annual quotas. The following quotas were agreed by the Conference of the Parties. At the 8th meeting of the Conference of the Parties to CITES (1992) the population was retained in Appendix II under the conditions of Resolution Conf. 3.15 on ranching.

| Annual quota | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|---|
| Wild | 150 | 1000 | 1000 | 1000 | | | |
| Ranched | | 4000 | 4000 | 4000 | 5000 | 6000 | 8000 |

Under the Wildlife Conservation Management Act of 2 October 1974, *C. niloticus* is listed as a game species and may only be taken under licence. However, Legal Notice No.120 of 19 May 1977 banned all hunting until further notice and cancelled all hunting licences. Only eggs may be collected from the wild and permits are no longer issued for the collection of live animals. A Management Plan has recently been developed (Kenya Wildlife Service *in litt.*, 30 August 1990). There are at least two commercial farms in Kenya.

## Baobab Farm Limited

P O Box 81995, Mombasa, Kenya

Manager: R.D. Haller
Date of Establishment: 01/01/76
Date of Census: 31/12/89
Total Area: (3 breeding ponds, 17 rearing ponds)
Food: Livestock mortalities, fish (Tilapia) from their own farming system

Registered captive-breeding operation (CITES Notification No.568, 31 January 1990). The crocodiles are kept as part of an integrated aquaculture system involving Tilapia and rice. Most of the stock on the farm derives from crocodiles hatched from eggs collected from the wild 1982-1984. All production since then has been from captive breeding. The farm has recently applied for an annual quota to collect up to 1500 eggs from the wild.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 120 | 463 | 6 | 37 | 626 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1984 | 53 | 73 | 127 | - |
| Eggs collected | C.nil | 1982 | - | - | - | 950 |
| Hatchlings collected | C.nil | 1982 | - | - | - | 795 |

Source of Information: Questionnaire; Anon., 1990b

## Kenya Crocodile Farm Ltd.

Mamba Village, P.O. Box 85723, Mombasa, Kenya

Manager: A. Zilber and Y. Regev, Clal Crocodile Farms
Date of Establishment: 01/01/84
Date of Census: 01/01/89
Total Area: 25 acres (5.85ha), (3 breeding ponds, 15 rearing ponds)
Food: Beef, chicken, fish, fish proteins, vitamins and minerals from local farms

Registered captive-breeding operation (CITES Notification No.421, 28 November 1986). The stock on the farm derives from adults, hatchlings and eggs collected from the Tana River.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 2000 | 3500 | 31 | 115 | 5646 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | - | 1146 | 1428 | 1910 | 2562 |
| Eggs collected | C.nil | 1986 | 3690 | 2801 | 1343 | 785 |
| Hatchlings collected | C.nil | 1986 | 731 | 1226 | 492 | 0 |
| Skins produced | C.nil | 1987 | 150 | 1850 | 2100 | 1100 |

Source of Information: Questionnaire; Anon., 1986c and 1991f; Zilber, 1991

**Species present:** *Crocodylus siamensis*

Lao PDR has no laws in effect specifically to protect wildlife. In 1986 a Decree by the Council of Ministers called for a total ban on trade of all species. The forestry section of the Ministry of Agriculture, Forestry, Irrigation and Cooperatives, and local administrative authorities are responsible for the implementation of the decree.

No recent records are known, indicating that *C. siamensis* may have been extirpated (CAP, 1991).

There are believed to be no commercial crocodile farms in Lao PDR.

**Species present:** *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

**CITES entered into force in Liberia on 9 June 1981.**

**Total protection of all three species is given under the Forestry Authority Regulation Wildlife Conservation Regulation of September 1981, and as a Decision of the President, 1978. Possession of, and national and international trade in, these species is prohibited.**

**There are believed to be no commercial crocodile farms in Liberia.**

Species present: *Crocodylus niloticus*

CITES entered into force in Madagascar on 18 November 1975.

*C. niloticus* was transferred from CITES Appendix I to II on 1 August 1985 under the special criteria set out in Resolution Conf. 5.21, subject to annual quotas. The following quotas were agreed by the Conference of the Parties.

| Annual Quota | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|---|---|
| Wild | 1000 | 1000 | 3784 | 1000 | - | - | 100 | 100 | 100 |
| Ranched | - | - | - | - | - | 2000 | 3000 | 4000 | 4300 |

The quota for 1988 was increased from 1000 by postal procedures described in Notification to the Parties dated 18 August 1988. This was to allow the export of a stockpile of skins.

In Madagascar, this species was treated as a pest under *Décret repartissant en trois catégories, les oiseaux, les animaux et sauvages vivants, 1961*. However, since 1988 it has been reclassified as a game species (*Décret* No.88-243, 15 June 1988) which has improved the control on its harvest. Quotas have been enforced, and only a certain percentage of hides allowed to be exported raw. In 1987 programmes were set up for monitoring the wild population and training forest officers in crocodile management. All hunters, tanners, manufacturers and retailers of crocodiles and crocodile products were issued licences.

There are currently four crocodile farms in Madagascar, which are taking part in a newly established ranching programme. One of the farms, formerly owned by M. de Lanessan, was the first farm to be registered with the CITES Secretariat as a captive-breeding operation.

## Donty

Madagascar

Manager: Jean Baptiste Donty
Date of Establishment: 01/01/90

The farm was authorized to collect hatchlings at Antsalova and Vohemar in 1990.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | - | - | - | - |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.nil | 1990 | - | - | - | 400 |

Source of Information: Anon., 1990a

## Elevage de crocodiles d'Antsobolo

Antsobolo, Ampanotokana Ambohidratrimo, Madagascar

Manager: Charles de Lanessan (recently deceased)
Date of Establishment: 01/01/69

This farm was the first to be registered with the CITES Secretariat as a captive-breeding operation (CITES Notification No.269, 20 September 1983). Production remained low for many years and eventually, in 1989, the bulk of the stock was sold to a new farm (Hutton, 1989b). Eggs were collected from the Ikopa River in 1990.

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | - | - | - | - | - | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Captive breeding | C.nil | 1980 | - | - | - | - |
| Eggs collected | C.nil | 1990 | - | - | - | 977 |
| Hatchlings collected | C.nil | 1969 | - | - | - | - |

Source of Information: Anon., 1983

## Reptel

B.P. 563 Antananarivo, Madagascar

Manager: Christophe J. Peyre
Date of Establishment: 01/01/86
Date of Census: 31/12/90
Total Area: 20000m$^2$ (10 breeding ponds, 20 rearing ponds)
Food: Fish and meat from abattoirs and fisheries

Registered captive-breeding programme (CITES Notification No.568, 31 January 1990). The farm received authorization to start collecting eggs from the wild in 1990 from the north of the country at Vohemar.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 1534 | 150 | 7 | 23 | 1714 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1988 | - | 450 | 954 | - |
| Eggs collected | C.nil | 1990 | - | - | - | 568 |
| Skins produced | C.nil | - | - | - | 442 | - |

Source of Information: Questionnaire; Anon., 1990b

## Société Voay

Madagascar

Date of Establishment: 01/01/90

The farm was authorized to collect eggs in 1990 between the Maningoza, Sambao and Soahany rivers (Anon., 1991b).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | - | - | - | - |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.nil | 1990 | - | - | - | 2887 |

Source of Information: Anon., 1990a

Species present: *Crocodylus niloticus*

CITES entered into force in Malawi on 6 May 1982.

*C. niloticus* was transferred from CITES Appendix I to II on 1 August 1985 under the special criteria set out in Resolution Conf. 5.21, subject to annual quotas. The following quotas were agreed by the Conference of the Parties. The population was retained in Appendix II under the conditions of Resolution Conf. 3.15 on ranching on 18 January 1990.

| Annual quota | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|
| Wild | 500 | 700 | 700 | 700 |
| Ranched | - | 200 | 1000 | 1600 |

The quotas for 1988 and 1989 were increased from 1000 and 1300 respectively by postal procedures described in a Notification to the Parties dated 18 August 1988.

Taking of this species is authorized under licence, and partial protection is given under the Crocodile Act of December 1968. Licences are required for hunting, trading, possession and rearing of crocodiles. Permits are required for imports and exports of crocodiles or crocodile parts, except for articles lawfully manufactured as crocodile products. Holders of licences must keep records and submit returns; crocodile products may only be purchased from holders of hunting or trading licences or certificates of ownership. This Act also provides for enforcement measures and penalties. There are two commercial farms in Malawi

## Dwangwa Sugar Corporation

P.O. Box 46, Dwangwa, Malawi

Manager: P.M. Stover
Date of Establishment: 01/01/84
Date of Census: 31/12/89
Food: Cichlid fish bred on farm and livestock mortalities

The farm is run as part of the Dwangwa Sugar estate and uses waste hot water from the sugar processing factory to maintain a temperature of 30°C. Eggs are collected from crocodile nesting areas throughout Malawi. Originally a quota of 2000 was allocated but this was subsequently reduced to 1500. Skin production was said to be in the region of 200 in 1989. A proportion of the hatchlings are released into Nkotakota Game Reserve.

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | 1669 | 4555 | 51 | 13 | 6242 | |
| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
| Captive breeding | C.nil | 1988 | - | 76 | 137 | 71 |
| Eggs collected | C.nil | 1984 | 1998 | 2369 | 1989 | 2121 |
| Skins produced | C.nil | 1987 | 200 | 1000 | 1110 | 1122 |

Source of Information: Questionnaire, Anon., 1989a; Deodatus, 1990; Matemba *in litt.*, 1991

## Koma-Croc

Private Bag 2, Monkey Bay, Malawi

Manager: Sabadia and Osman
Date of Establishment: 01/07/87
Date of Census: 26/11/90
Total Area: 37 hectares (1 breeding pond, 8 rearing ponds)
Food: Fish and meat from their fish ponds and farms

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | 24 | 250 | ----(27)---- | | 301 | |
| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
| Captive breeding | C.nil | 1988 | - | 250 | 200 | 27 |
| Eggs collected | C.nil | 1988 | - | 250 | 200 | 600 |
| Skins produced | C.nil | 1990 | - | - | - | 1 |

Source of Information: Questionnaire; Matemba *in litt.*, 1991

**Species present:** *Crocodylus porosus*
*Crocodylus siamensis* ?
*Tomistoma schlegelii*

CITES entered into force in Malaysia on 18 January 1978.

**Peninsular**

*C. porosus* and *T. schlegelii* are totally protected under Schedule 1 of the Protection of Wildlife Act, 1972, as amended in 1976 and 1980. They may not be taken, shot or killed, except in special circumstances.

The Protection of Wildlife (Amendment) Act, 1976, allowed the Minister to grant one permit per applicant per year to shoot, kill, take, keep, import, export, confine or breed any totally protected wild animal.

There are no commercial crocodile farms in Peninsular Malaysia but there are 10-12 farms keeping up to 1000 *C. porosus*, usually in conjunction with chicken or pig farms (Khan pers. comm., 1992).

**Sabah**

*C. porosus* and *T. schlegelii* are listed on the First Schedule, Part One, Protected Animals, of the Fauna Conservation Ordinance, 1963. They may be taken only under special licence, for scientific or zoological use.

The following is a list of commercial farms. However, there are 15-20 owners who keep crocodiles as scavenger agents on chicken, duck and pig farms. Crocodiles are also kept as a tourist attraction (Khan pers. comm., 1992).

## Andrassy Farming & Research

P.O. Box No.966, 91008 Tawau, Sabah, Malaysia

Manager: Nicholas Y.K. Chung
Date of Establishment: 01/06/89
Date of Census: 01/01/91
Total Area: 19.21 acres (7.78ha), (2 breeding ponds, 16 rearing/nursery)
Food: Shrimps, fish and animal offal purchased locally

Although not yet admitting tourists, this is one of the eventual aims. The farm has applied to be registered with CITES but as yet there has been no Notification. In due time the farm contemplates exporting excess animals (salted skin) to other member countries, particularly Singapore and Japan.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | 173 | 198 | 32 | 52 | 455 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1990 | - | - | - | 173 |

Source of Information: Questionnaire; Kinabalu *in litt.*, 1991

## Sandakan Crocodile Farm

P.O. Box 633, 9007 Sandakan, Sabah, Malaysia

Manager: Chai Yau Look
Date of Establishment: 01/01/64

The farm name has recently been changed from Chai Mei Hwa Crocodile Farm. Registered captive-breeding operation (CITES Notification No.407, 11 August 1986). Stock were caught from wild populations in Sabah, from confiscations of illegally caught animals and from captive-breeding operations. According to Anon. 1991c (CITES Notification No.622, 5 February 1991) the farm holds the following stock:

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | 256 | 689 | 82 | 237 | 1264 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1984 | 186 | 198 | 287 | 398 |
| Skins produced | C.por | - | 234 | 125 | 280 | - |

Source of Information: Anon., 1986b and 1991c; Shah, 1991

### Sarawak

Species present: *Crocodylus porosus*
*Tomistoma schlegelii*

The Wildlife Protection Ordinance (21 May 1990) replaces the Wildlife Protection Ordinance of 1958. *T. schlegelii* and *C. porosus* are listed in the First Schedule, Part II, as protected animals. Protected animals and parts thereof may not be hunted, killed, captured, sold, offered for sale, imported, exported or held in possession except under licence. Exceptions are made for scientific, educational and conservation purposes and require written permission from the Director of Forests.

The Customs (Importation and Exportation Prohibition) Order of 1988 calls for the absolute prohibition of importation and exportation of any animal on Part One of the First Schedule.

There are also believed to be other farms operating in Sarawak, with the main species being *C. porosus*, but no information is available.

## Jong's Crocodile Farm

P.O. Box 670, Kuching, Sarawak, Malaysia

Manager: Jong Joon Soon "J"
Date of Establishment: 01/01/63
Date of Census: 31/12/89
Total Area: 6 acres (2.43ha), (4 breeding ponds, 29 rearing ponds)
Food: Small chicks from poultry farms.

This farm receives visiting tourists. Registered captive-breeding operation (CITES Notification No.652, 28 August 1991). According to this Notification this farm also holds specimens of *T. schlegelii* not covered by the registration.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | 340 | 342 | 66 | 221 | 969 |
| *T.schlegelii* | - | - | 16 | 32 | 48 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1980 | 227 | 342 | 340 | - |
| Skins produced | C.por | 1984 | - | 49 | 15 | - |

Jong's Crocodile Farm submitted the following stock and export information on 5 April 1991:

*Crocodylus porosus*: (Wild-caught in Sarawak)
17-27 years - 145
13-16 years - 142
Below 6 yrs - 501
**Progeny from above - 935**

50-100 wet-salted skins of *Crocodylus porosus* have been exported since 1984.

*T. schlegelii*: (Wild-caught)
13-20 years - 6
7-12 years - 4
Below 6 yrs - 29

Source of Information: Questionnaire; Anon 1991j

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*

Mali is not a Party to CITES.

Both species were partially protected by the *Ordonnance portant institution d'un code de la chasse* of 14 November 1969. They were classified as game species under this law and could only be taken by holders of hunting licences, with a bag limit of three animals per year per licence holder. An overall hunting ban has been established in the past few years under Decree 325PG-RM (date unknown).

One farm has been reported by the Directeur Général des Eaux et Forêts but it does not produce skins commercially.

## Mamadou, Mali Reptiles Cuirs et Peaux

BP 907, Bamako, Mali

Manager: Maribatourou Diaby
Date of Establishment: 01/01/83

Source of Information: DGEF *in litt.*, 1990

**Species present:** *Crocodylus cataphractus*

**Mauritania is not a Party to CITES.**

**Commercial hunting of all species of wildlife is prohibited, but other taking is not covered.**

**There are believed to be no commercial crocodile farms in Mauritania.**

Species present: None indigenous.

## La Vanille Crocodile Park

BCM Bioculture Ltd, Senneville, Riv. des Anguilles, Mauritius

Manager: Owen Griffith
Date of Establishment: 21/02/85
Date of Census: 29/12/89
Total Area: (2 breeding ponds, 8 rearing ponds)
Food: Meat and chicken from abattoirs and chicken farms

Registered captive breeding operation (CITES Notification No.610, 31 October 1990). Original stock of crocodiles was imported from Antsobolo Crocodile Farm, Madagascar in 1985. The first juveniles imported started to breed in 1990. No skins have been produced yet.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | 2 | - | - |
| *C.niloticus* | 81 | 93 | 19 | 51 | 244 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1985 | 52 | 18 | 81 | - |

Source of Information: Questionnaire; Anon., 1990e

Species present: *Caiman crocodilus*
*Crocodylus acutus*
*Crocodylus moreletii*

CITES entered into force in Mexico on 30 September 1991.

Commercial hunting is banned under *Ley de Caza* of 3 December 1951. *C. moreletii* is protected under the general commercial ban and under annual hunting regulations for hunting as a sport. The *Bases de Control* of 20 September 1982 established a ban on most commercial imports and exports of wildlife. Live imports and exports are banned except from captive-breeding centres. Import and export of killed animals are also generally banned.

Other relevant legislation is to be found in the *Ley Orgánica de la Administración Pública Federal, Reglamento Interior de la Secretaría de Desarrollo Urbano y Ecología, Ley Federal del Equilibrio Ecológico y Protección al Ambiente, Ley Federal de Derechos*, and the *Disposiciones Generales establecidas en el Acuerdo del Calendario cinegético correspondiente a la Temporada 1990-1991.*

There are believed to be eight commercial farms in Mexico and one farm breeding for conservation purposes.

## Granja Esteban Chazari El Fenix

Km12 Carr. Fed. 180, Puerto Real Mpio, Ciudad del Carmen, Campeche, Mexico

Manager: SEDUE
Date of Establishment: 01/01/85
Date of Census: 01/01/91
Total Area: (16 breeding ponds, 14 rearing ponds)
Food: Fish; Red meat for hatchlings

The total shown for captive breeding in 1989 represents a total figure given for 1987, 1988 and 1989.

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.moreletii* | 250 | 19 | 53 | 70 | 392 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Captive breeding | C.mor | 1978 | - | - | 420 | - |

Source of Information: Questionnaire; Garza Garcia *in litt.*, 1991

## El Paraíso

Predio el Porvenir, Mpio de Tapachula, Chiapas, Mexico

Manager: Arq. Manuel I. Muñiz Canales
Date of Census: 24/07/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.moreletti* | 76 | - | 13 | 15 | 104 |

Source of Information: Garza Garcia *in litt.*, 1991

## Profauna

Cerrada Plan de Ayala 24, Col S. Tomas Delg Miguel Hidalgo, D.F., Mexico

Manager: M.V.Z. Francisco
Date of Census: 28/09/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.moreletti* | 170 | 51 | 12 | 35 | 268 |

Source of Information: Garza Garcia *in litt.*, 1991

## Centro de Cocodrilos El Tanque, La Palma

Sierra de Alicia 157, Jardines de la Cruz, Tepic, CP 63168 Nayarit, Mexico

Manager: Roldan Pulido Perez, SEDUE
Date of Establishment: 01/01/90
Date of Census: 12/31/90
Total Area: (8 breeding ponds, 6 rearing ponds)
Food: Fish and red meat from the municipal slaughterhouse

The farm is breeding *C. acutus* for conservation purposes.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | 62 | 22 | 2 | 4 | 90 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.acu | 1990 | - | - | - | 41 |

Source of Information: Questionnaire; Garza Garcia *in litt.*, 1991; Pulido and Villa, 1991

## Estación de Cocodrilos Lagunas de Chacahua

Km7½ Carr Cris. Colon, Tramo Oaxaca-Tehuantepec, 68100 Oaxaca, Mexico

Manager: SEDUE
Date of Census: 07/03/91
Total Area: (17 breeding ponds, 12 rearing ponds)
Food: Fish caught in the lake

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.acutus* | 19 | 5 | 3 | 13 | 40 |
| *C.moreletii* | - | - | - | - | - |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.mor | 1985 | - | 11 | 28 | - |

Source of Information: Questionnaire; Garza Garcia *in litt.*, 1991

## Crococum

S A de C V, Av Tulum, Lontes 77-88 Supermanzana IV, Cancun, Quintana Roo, Mexico

Manager: Lic. Jose Sosa

Source of Information: Garza Garcia *in litt.*, 1991

## Cocodrilos de Sinaloa

Paseo Niños Heroes 276, Pte Col Centro CP 80000 Culiacan, Sinaloa, Mexico

Manager: Arq. José Carlos Rodarte Salazar
Date of Establishment: 04/06/89
Date of Census: 01/07/91
Total Area: 12 hectares (1 breeding pond, 3 breeding ponds)

Food: Meat and chicken from slaughter-houses

The farm has a heated chamber which has capacity for 1280 juveniles. SEDUE will take 15% of crocodiles bred at the farm for reintroduction into the wild. Commercial production is expected to start in 1993.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.moreletii* | 45 | 169 | 57 | 130 | 356 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.mor | 1989 | - | - | - | 80 |

Source of Information: Questionnaire; Garza Garcia *in litt.*, 1991

## Tuxpan, Ejido la Moderna

11.5km de la Ciudad de Tuxpan, Mpio. de Tuxpan, Edo Veracruz, Mexico

Manager: SEDUE
Date of Establishment: 01/01/87
Date of Census: 31/12/89
Total Area: (3 breeding ponds, 8 rearing ponds)
Food: Chicken entrails, fish, red meat and minerals

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.acutus* | 1 | - | - | - | 1 |
| *C.moreletii* | 5 | - | - | - | 5 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Hatchlings collected | C.acu | - | - | 1 | - | - |
| | C.mor | - | - | 8 | - | - |

Source of Information: Questionnaire; Garza Garcia *in litt.*, 1991

## Crococum Cholul

S.A. de C.V. Prol. Paseo Montes 497, Merida, Yucatan, Mexico

Manager: Lic. Emilio G. Díaz

Source of Information: Garza Garcia *in litt.*, 1991

Species present: *Crocodylus niloticus*

CITES entered into force in Mozambique on 23 June 1981.

*C. niloticus* was transferred from CITES Appendix I to II on 1 August 1985 under the special criteria set out in Resolution Conf. 5.21, subject to annual quotas. The following quotas were agreed by the Conference of the Parties. The population was retained in Appendix II under the conditions of Resolution Conf. 3.15 on ranching on 18 January 1990.

| Annual quota | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|
| Wild | 1000 | 1000 | 1000 | 1000 |
| Ranched | | | | 3000 |

*Modalidades de Caca* of 1978 and Hunting Regulations *Portaria* 117/78 of 16 May 1978 regulate sport, hunting and hunting methods, and trade in trophies. Import and export are prohibited except where authorized. The Direcção Nacional de Florestas e Fauna Bravia has set a quota of 3000 wild skins for 1991 (DNFFB *in litt.*, 2 October 1991).

There are a total of four farms currently operating in Mozambique, the oldest of which was established in 1988. Oreste (*in litt.*, 1991) gave the locations of three farms:

## Benguela Holdings

Benguerra Island, Mozambique

## Empresa (Chicamba Farm)

Manica Province, Mozambique

## Crocodilos do Unbeluzi

Maputo Province, Mozambique

## Crocodilos de Mozambique

C. Postale 2828, R. Consiglieri Pedroso 114, Maputo, Barazuto Island, Mozambique

Manager: R.T. van der Riet
Date of Establishment: 01/08/88

A farm was initially planned at Chicoa in 1987 but had to be abandoned because of security problems. A second site was chosen at Bazaruto Island in 1988. Eggs were collected from

Cahora Bassa and transferred to Zimbabwe for incubation. The resulting hatchlings were returned to Bazaruto Island in August 1988. The farm has subsequently built its own incubator.

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | - | - | - | - | - | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Eggs collected | C.nil | 1987 | - | 1050 | - | - |

Source of Information: Anon., 1989b

Species present: *Crocodylus porosus*
*Crocodylus siamensis* ?
*Tomistoma schlegelii*

Myanmar is not a Party to CITES.

Under the Wildlife Protection Act of 1936 no person shall hunt any animal in a sanctuary without permission of the President, which is granted only for scientific purposes. The import and export of living animals in general are prohibited. No further protection appears in this Act. There appears to be only one commercial farm operating in Myanmar.

## People's Pearl & Fisheries Corporation

Myanmar Fisheries Enterprise, 654 Konthe Lan, Yangon, Myanmar

Date of Establishment: 01/01/78
Date of Census: 01/01/92
Total Area: (1 breeding pond)
Food: Prawns (for hatchlings)

Little new information has been obtained since 1983, when the farm was said to hold 900 *Crocodylus porosus*. By 1990, the stock had declined to 550 but rose again to 700 in 1992. A small breeding stock of *C. porosus* (120) is kept from which eggs are hatched in natural conditions. Juveniles are also collected from marshland mangrove areas, although hatchling mortality is said to be high. A survey is being conducted on natural wild stock and their habitats. Permits have been issued to export 260 *C. porosus* to Thailand in 1987 and 270 in 1989.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | 253 | ? | ----(120)---- | | c. 700 |

| | Spp. | 1st | 1988 | 1989 | 1990 | 1991 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | - | - | - | - | 149 |
| Hatchlings collected | C.por | - | - | - | - | 104 |

Source of Information: Aung Moe, 1992; Hafeez, 1990; Royal Forest Department, Thailand, pers. comm.; Webb, pers. comm.

Species present: *Crocodylus niloticus*

Namibia is a Party to CITES, the Convention having entered into force on 18/3/91. Prior to that it was formerly included under the South African acceptance of the Convention.

*Crocodylus niloticus* is listed as "protected game" under the Nature Conservation Ordinance 1975. Those dealing in crocodiles must be in possession of a valid Game Dealers Licence. There are currently thought to be only two commercial farms operating in Namibia.

## Crocodile Ranch

P.O. Box 424, Otjiwarongo 9000, Namibia

Manager: N.J.L. van Dyk
Date of Establishment: 30/7/85
Date of Census: 31/08/91

Registered captive-breeding operation (CITES Notification No.669, 16 January 1992). The stock originated from Botswana. The farm intends to export skins, live specimens and meat.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | 1131 | 7 | 117 | 1255 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Skins produced | C.nil | 1988 | - | 477 | 572 | 640 |

Source of Information: Anon., 1992

## Farm Eddaliof

Wildhanolelaarsliseusie 201000, Namibia

Manager: W. Delfs
Date of Census: 10/01/91
Total Area: (1 breeding pond, 1 rearing pond)
Food: Unborn calves from abattoir

Breeding crocodiles were purchased from Botswana (Thorbjarnarson, 1992).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | 60 | 6 | 4 | 70 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1988 | - | 76 | - | - |

Source of Information: Questionnaire

Species present: *Crocodylus palustris*
*Gavialis gangeticus*

CITES entered into force in Nepal on 16 September 1975.

*G. gangeticus* is listed on Schedule I of the National Parks and Wildlife Protection Rules 1973 as a protected animal. Hunting of this species is prohibited within a national park or protected area. Exceptions to the act include defence of domestic livestock or human life.

*C. palustris* may be taken under licence. A certificate of legal ownership is required for possession of a trophy. The Act requires that any person wishing to import or export a trophy must first seek a letter of approval from the Ministry of Forests and Soil Conservation.

There are no commercial crocodile farms in Nepal but there is a Gharial breeding farm at the Royal Chitwan National Park, Kasara, which is run for conservation purposes. In 1989, 141 hatchlings were produced from eggs collected along the Narayani River (Maskey, 1989). A total of 394 have so far been released into the wild from the farm (Maskey, 1990).

**Species present:** *Caiman crocodilus*
*Crocodylus acutus*

**CITES was ratified on 27 January 1978.**

**Under *Decreto* No.625 of 18 March 1977, Nicaragua prohibited commercial hunting and export of wildlife. With the authority of its Organic Law of 25 October 1979 (*Decreto* No.112), the *Instituto Nicaraguense de Recursos Naturales y del Ambiente* (IRENA) permits commercial hunting of certain species including caimans over four feet in length. Tourists are allowed to export two items made from *Caiman crocodilus*. *Crocodylus acutus* is fully protected under *Acuerdo* No.2 of 1983 (IRENA).**

**There are believed to be no commercial crocodile farms in Nicaragua.**

Species present: *Crocodylus niloticus*

CITES entered into force in Niger on 7 December 1975.

Crocodiles were listed as pest species by the *Loi fixant le régime de la chasse* of 4 August 1962. In 1964 an overall hunting ban was instituted for a period of two years; this ban was extended several times until a permanent hunting ban was established by decree in 1972. (The Nile Crocodile may have been upgraded to a fully protected species under the Hunting Act.)

There are believed to be no commercial crocodile farms in Niger.

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

The three species are officially protected under the Endangered Species Decree (No.11) 1985.

CITES entered into force in Nigeria on 1 July 1975.

Research on the nutrition of captive crocodiles is carried out by Daniel C. Alum, Federal Department of Forestry, Ministry of Agriculture, Water Resources and Rural Development, Enugu (Alum, 1989). Successful breeding has occurred with *C. niloticus* in 1989 and 1990 but not the other two species. Reports of privately owned farms in Nigeria have so far proved to be unfounded and are thought to be used as a pretext for the smuggling of wild-caught skins (Dore, 1991). There was reported to be a conservation project involving all three species at Port Harcourt (Jones, 1991).

Species present: *Crocodylus palustris*
*Gavialis gangeticus*

CITES entered into force in Pakistan on 19 July 1976.

Hunting comes under State jurisdiction:

| State | Species present | Completely Protected under |
|---|---|---|
| Islamabad | *C. palustris*<br>*G. gangeticus* | Islamabad Wildlife (Protection, Preservation, Conservation and Management) Ordinance 1979. |
| Baluchistan | *C. palustris ?*<br>*G. gangeticus* | Wildlife Protection Act 1974 |
| Azad Jammu and Kashmir | *C. palustris*<br>*G. gangeticus* | Azad Jammu and Kashmir Protection Act 1975 |
| North West Frontier Province | *C. palustris* | North West Frontier Province Wildlife (Protection, Preservation and Management) Act 1975. |
| Punjab | *C. palustris*<br>*G. gangeticus* | Punjab Wildlife (Protection, Preservation, Conservation and Management) Act 1974 |
| Sind | *C. palustris*<br>*G. gangeticus*<br>*C. porosus* | Sind Wildlife Protection Ordinance 1972 |

The wildlife legislation in each of the provinces completely protects the species named. Hunting is subject to a permit which is only granted for scientific purposes. Exceptions are also made for defence of livestock and human life.

The Export Trade Control orders of 1981 and 1982 provide the current legislation controlling exports at the Federal level. These regulations prohibit the export of all live animals and their derivatives, the exception being animals under a quota system (although no quota systems seem to be operational).

There are no commercial crocodilian farms in Pakistan, but a captive-breeding operation in the Sind is reportedly under way; plans are to rear crocodiles for three years before releasing them for the purpose of restocking depleted wild populations (Thorbjarnarson, 1982). The Indian Government has agreed to export a small number of crocodiles to a breeding centre in the Punjab (Whitaker, 1990).

Species present: *Crocodylus porosus*

Palau is covered by the USA ratification of CITES.

The 1973 US Endangered Species Act (q.v.) applies to the islands and *Crocodylus porosus* was listed as Endangered in 1979.

Although there have been several unsuccessful attempts in the past to establish crocodile farms in Palau, there is currently only one establishment, which is not yet operating commercially. Several other individuals throughout the islands have small numbers (<5) of animals (Messel and King, 1991).

## Eberdon, Joshua

Koror, Palau

Manager: Joshua Eberdon
Date of Establishment: 01/01/89

All of the crocodiles were collected in Palau 1989-1991. They range in size from 3 to 11ft.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | - | - | - | - | 41 |

Source of Information: Messel and King, 1991

Species present: *Caiman crocodilus*
*Crocodylus acutus*

CITES entered into force in Panama on 28 October 1977.

*Caiman crocodilus* and *Crocodylus acutus* are classified as endangered and are protected under *Resolución* No.002-80 of 24 January 1980. Capture, hunting, purchase, sale or export of listed species is prohibited; exemptions from the ban are fairly narrow.

There are currently two farms of uncertain status in Panama.

## Trade Tech Inc.

Panapiel Internacional, Apartado 69745, Panama City, Panama

Manager: Eimar Velasco
Date of Census: 10/06/90
Total Area: *c.* 4000m$^2$ (3 earth ponds)
Food: Fish and fish waste purchased in the market and pig waste from own farm.

The farm was said to have a population of 300 of both species combined. Between 28 and 36 nests were said to have been produced by *C. acutus*, the eggs being removed to Panama City for incubation. However, the standard of husbandry was reported to have been very low and it is unlikely that significant breeding success was achieved. INRENARE reported that the farm was not registered with their office as breeding either species.

Source of Information: Botello *in litt.*, 1990; Rodriguez and Rodriguez, 1990

## Panama Gators SA

Chilibre, Distrito Capital, Panama

Manager: Gladys de Vallarino
Date of Establishment: 01/01/82
Date of Census: 10/06/90
Total Area: (7 natural pools)
Food: Offal and waste from pig farm.

The operation is associated with a pig farm which has several natural pools. Since 1982 these have been progressively fenced off, thereby enclosing a population of originally wild *Caiman crocodilus*, now estimated to number some 12,000. Little attempt has been made to manage them, but some crocodilians have bred in the pools. No records have been kept. The farm is not registered with INRENARE as breeding crocodilians.

Source of Information: Rodriguez and Rodriguez, 1990; Botello *in litt.*, 1990

Species present: *Crocodylus novaeguineae*
*Crocodylus porosus*

CITES entered into force in Papua New Guinea on 11 March 1976.

The Crocodile Trade (Protection) Act 1982, as amended, controls commercial hunting and trade of crocodiles, including skins and by-products. Any person wanting to sell or buy crocodiles may only do so in accordance with a Crocodile Traders' Licence. A Company Crocodile Buyers' Licence is required for the purchase of live crocodiles or skins by employees of companies holding exporters' licences; the holder must have lived in Papua New Guinea for at least two years and must live in the area in which trading activity is occurring. Records of the number and size of crocodiles bought must be sent to the Conservator of Fauna every three months. Licences for trade are issued by the Minister of the Environment. Farms must be registered with the Government if more than 200 animals are held, or if the owner is not a citizen or holds any crocodile licence.

In 1981, regulations were made under the Act covering size restrictions for skins that may be traded (18-51cm in width), or live crocodiles kept on farms, seasons and areas for killing. Total exports of skins in 1990 amounted to 28,455 *C. novaeguineae* and 6293 *C. porosus* (Wilmott *in litt.*, 1991).

There are believed to be six farms in Papua New Guinea, five being listed below. The sixth, the Madang Crocodile Farm, has been noted but there is no other information (Genolagani pers. comm., 1992).

## Mainland Holdings

Box 196, Lae, PNG

Manager: Brian Vernon
Date of Establishment: 01/01/78
Date of Census: 31/12/89
Total Area: (18 breeding ponds, 43 rearing tanks)
Food: Minced chicken offal from their chicken factory

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | 1034 | 12989 | - | - | 14023 |
| *C.porosus* | 3773 | 9303 | 52 | 137 | 13265 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1987 | 425 | 1005 | 1678 | 4368 |
| Eggs collected | C.nov | 1988 | 850 | 1480 | - | 1374 |
| | C.por | 1988 | - | 645 | 1198 | 1870 |
| Hatchlings collected | C.nov | 1979 | 9379 | 6910 | 5405 | 5056 |
| | C.por | 1979 | 2345 | 1727 | 1351 | 3448 |
| Skins produced | C.nov | 1981 | 2026 | 2200 | 6625 | 4360 |
| | C.por | 1981 | 1247 | 1155 | 2870 | 1019 |

Source of Information: Questionnaire

## Schulz P. Ludwig

P.O. Box 687, Wewak, East Sepik Province, PNG
Manager: Ludwig P. Schulz
Date of Establishment: 01/01/79

No recent information.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | - |
| *C.porosus* | - | - | - | - | - |

Source of Information: Wilmot *in litt.*, 1991

## Micro Enterprises

P.O. Box 995, Madang, MP, PNG

Manager: Simon Seeto
No recent information.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | - |
| *C.porosus* | - | - | - | - | - |

Source of Information: Wilmot *in litt.*, 1991

## Ilimo Farm

P.O. Box 1885 Boroko, Port Moresby, NCD, PNG

Date of Establishment: 01/01/79
Food: Minced chicken offal from their chicken factory.
No recent information.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.porosus* | - | - | - | - | - |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | - | 72 | 70 | 69 | 64 |
| | C.nov | - | 4 | 4 | 4 | 4 |
| Eggs collected | C.por | - | - | - | - | - |
| | C.nov | - | 440 | 820 | 850 | 750 |
| Hatchlings collected | C.nov | - | - | - | - | - |
| | C.por | - | 260 | 492 | 295 | 5 |
| Skins produced | C.nov | - | 373 | 269 | 111 | 106 |
| | C.por | - | 105 | 169 | 19 | 41 |

Source of Information: Wilmot *in litt.*, 1991

## Lake Murray Crocodile Farm

P.O. Lake Murray, via Kiunga, Western Province, PNG

No recent information.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.novaeguineae* | - | 10 | 2 | 1 | 13 |
| *C.porosus* | - | - | - | - | - |

Source of Information: Wilmot *in litt.*, 1991

Species present: *Caiman crocodilus*
*Caiman latirostris*
*Caiman palperbrosus*
*Caiman paleosuchus*

CITES entered into force in Paraguay on 13 February 1977.

Under *Decreto* No.18.796 (November 4, 1975) all hunting and trade in *C. latirostris* is banned.
Under *Decreto* No.10.655 (August 23, 1991) CITES-Paraguay was formed as an office of The Ministry of Agriculture and Livestock, to implement CITES and to regulate the utilization of crocodilian species as well as other species mentioned in the convention.
Paraguayan legislation allows the selling of confiscated skins; however in 1990, a trader claiming to have bought 35,236 confiscated skins in 1989 applied for permission to export them, but this was refused because of the non-existence of documents to prove that these skins existed (Aquino-Shuster, 1990).

There is reported to be one crocodilian farm in Paraguay, but no evaluation of production has been carried out. A plan for a potential farm has been submitted to the Ministry of Agriculture and Livestock but no infrastructure has been developed as yet (Aquino-Shuster, 1990).

**Yasuchi Kobuchi**

Choferes del Chaco 1478, Asuncion, Paraguay

Species present: *Caiman crocodilus*
*Crocodylus acutus*
*Melanosuchus niger*
*Paleosuchus palpebrosus*
*Paleosuchus trigonatus*

CITES entered into force in Peru on 25 September 1975.

*Decreto Supremo* No.934-73-AG of 3 October 1973 declared an indefinite prohibition on all non-subsistence hunting and trade of amphibians, mammals, birds and reptiles from the Selva region (Amazonia). Hunting and trade is permitted for scientific purposes. None of the caiman species is on the list of those which may be hunted for subsistence purposes. *C. acutus* is fully protected by *Resolución Ministerial* No.01710-77-AG/DGFF of 4 October 1977 as a species in danger of extinction. *C. crocodilus* and *M. niger* are classified as vulnerable species and, unless there are exceptional circumstances, are protected by this law.

There are believed to be no commercial crocodile farms in Peru.

Species present: *Crocodylus mindorensis*
*Crocodylus porosus*

CITES entered into force in the Philippines on 16 November 1981.

There appears to be no protection for either of these species in the Philippines (Nichols *et al.*, 1991) although *C. mindorensis* is said to be protected (Thorbjarnarson, 1992).
There are no commercial crocodile farms in the Philippines, but there are three experimental operations aimed at conservation of the two native species.

## Crocodile Breeding Project

**Calauit Game Reserve and Wildlife Sanctuary, Philippines**

Manager: Cons. & Res. Management Foundation
Date of Establishment: 01/08/85
Date of Census: 01/09/91
Total Area: 250m$^2$
Food: Locally caught fish, *Varanus* and frogs

The Smithsonian Institute operates this project in conjunction with Silliman University to breed and conserve the species.

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.mindorensis* | 6 | - | 1 | 2 | 9 | |
| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
| Captive breeding | C.min | 1991 | - | - | - | - |

Source of Information: Penafiel *in litt.*, 1991

## Crocodile Breeding Project

**Silliman Univ. Marine Laboratory, Dumaguete City, 6200 Negros Oriental, Philippines**

Manager: Silliman University
Date of Establishment: 01/01/80
Date of Census: 19/09/91
Total Area: (1 breeding pond, 2 rearing ponds)
Food: Locally caught and donated bats, cats, rats, dogs, frogs and insects

Operated in conjunction with the Smithsonian Institution as a research project and to breed the endangered *C. mindorensis*.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | - |
| *C.porosus* | - | - | - | - | - |
| *C.mindorensis* | | | | | |

Source of Information: Penafiel *in litt.*, 1991

## RP-Japan Crocodile Farming Institute

P.O. Box 101 Irawan, Puerto Princesa City 5300 Palawan, Philippines

Manager: Dr Gerardo V. Ortega
Date of Establishment: 04/03/88
Date of Census: 31/08/91
Total Area: 10 hectares (30 breeding ponds, 120 ponds + 328 tanks)
Food: 30% fish (Tuna and Tilapia) and 70% meat of broilers/duck/carabeef/pork/beef

This farm is a joint venture between the Philippine Department of Environment and Natural Resources (DENR) and the Japan International Cooperation Agency (JICA) and is primarily intended to conserve the native species of crocodilians. The majority of the stock (38 adult *C. porosus* and 31 adult *C. mindorensis*) were purchased from within the country but a total of 17 and 1 of the two species, respectively, was collected from the wild.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.mindorensis* | 143 | 84 | 20 | 20 | 267 |
| *C.porosus* | 213 | 131 | 28 | 38 | 410 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.min | 1988 | - | - | 7 | 14 |
| | C.por | 1990 | - | - | - | 62 |
| Eggs collected | C.por | 1989 | - | - | 28 | 17 |
| Hatchlings collected | C.min | 1987 | 2 | - | 1 | 2 |
| | C.por | 1987 | 33 | 5 | - | 3 |

Source of Information: Questionnaire; Sibal *in litt.*, 1991

Species present: None native

## Rotasol

Rua da Magdalena, 214-1 Dto, 1100 Lisboa, Portugal

Manager: Jose Cirilo

This company was enquiring about the possibility of importing crocodiles to start a farm in Algarve. Authorization was granted but no crocodiles had been imported by the end of 1991.

Source of Information: Cirilo *in litt.*, 1989; Vila Nova *in litt.*, 1991

Species present: *Crocodylus niloticus*

CITES entered into force in Rwanda on 18 January 1981.

*Ordonnance-loi portant création de l'office Rwandais du tourisme et des parcs nationaux* of 18 July 1973 regulates hunting and lays down conditions for issuance and validity of hunting licences. It also regulates possession of, and trade in, animals and trophies. *Arrêté portant réglementation sur la chasse* establishes the fees payable for the killing of protected animals (with a scientific or administrative licence) and of partially protected animals, including *C. niloticus*.

There are believed to be no commercial crocodile farms in Rwanda.

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

CITES entered into force in Senegal on 3 November 1977.

The three species present are fully protected under *Décret portant code de la chasse et la protection de la faune* of 23 May 1967. The import of protected animals and their products is prohibited, as is the export of these animals and their products, including meat.

There are believed to be no commercial crocodile farms in Senegal.

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

Sierra Leone is not a Party to CITES.

Under the Wildlife Conservation Act of 1972, crocodile species are listed under Schedule 4 as Game species and may be taken by holders of relevant permits up to a limit of ten per person. They are also classified as dangerous animals and their import and export are prohibited. Trade in meat, hides or skins is prohibited unless an appropriate permit has been obtained from the Minister and permits for animals to be taken from Game Reserves can only be obtained for scientific, educational or breeding purposes.

There are believed to be no commercial crocodile farms in Sierra Leone.

Species present: *Crocodylus porosus*

CITES entered into force in Singapore on 28 February 1987. It initially took a reservation on *C. porosus*, *C. novaeguineae* and *C. crocodilus*, but the reservations on the first two species were withdrawn in August 1990 and on the latter on 15 February 1992.

Importations are subject to permit.

There are five commercial crocodile farms operating in Singapore.

## Jurong Crocodile Paradise Pte Ltd

241 Jalan Ahmad Ibrahim, Singapore

Manager: John Tan Pau Yong
Date of Establishment: 22/11/86
Date of Census: 01/08/89
Total Area: 2 hectares (5 breeding areas, 2 rearing enclosures)
Food: Whole chickens and frozen fish from a local supplier

Registered captive-breeding operation (CITES Notification No.610, 31 October 1990). The farm originally started operating outside the city (Track 13, Punggol Road), but transferred to new premises in late 1988. It now provides a major tourist attraction with an underwater viewing gallery, theatre and educational facilities. Most of the stock (from the wild) were purchased from the 1970s until 1986. Some have been acquired from other farms and a few problem animals have been captured in Singapore. Skins from the farm have been processed and manufactured locally for sale to tourists.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | 10 | - | - | 10 |
| *C.porosus* | 50 | 532 | 671 | 1115 | 2364 |
| *T.schlegelii* | - | 21 | - | - | 21 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1988 | - | - | 52 | - |
| Skins produced | C.por | 1989 | - | - | 864 | - |

Source of Information: Questionnaire; Anon., 1990e

## Long Kuan Hung Pte Ltd

8 Bridport Avenue, 1955, Singapore

Manager: Lee Bak Kuan
Date of Establishment: 01/01/65

Registered captive-breeding operation (CITES Notification No.610, 31 October 1990). The specimens of *T. schlegelii* are not covered by the registration. Information on stock obtained from Primary Production Department.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | - | - | - | 15 |
| *C.porosus* | - | - | - | - | 3725 |
| *T.schlegelii* | - | - | - | - | 15 |

Source of Information: Anon., 1990e; PPD *in litt.*, 1990

## Renjong Crocodile Farm Pte Ltd

1 Poh Huat Crescent, 1954, Singapore

Manager: Muhamad Suhaimi Bin
Date of Establishment: 12/01/90
Date of Census: 01/08/90
Total Area: (1 breeding pond, 18 rearing ponds)
Food: Fish and chicken from a wholesale market

This farm is about to move to new premises.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | 12 | - | - | 12 |
| *C.porosus* | 128 | 450 | 4 | 10 | 592 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1990 | - | - | - | 128 |

Source of Information: Questionnaire

## Singapore Crocodilarium Pte Ltd

730 East Coast Parkway, Singapore 1543, Singapore

Manager: Simon Soh Eng Leong
Date of Establishment: 01/01/80
Date of Census: 31/12/89
Total Area: 1 acre ? (24 breeding ponds, 7 rearing ponds)
Food: Fish meat, chicken and beef from the market

Registered captive-breeding operation (CITES Notification No.610, 31 October 1990). The farm was initially established with stock purchased from the wild in 1965 at Joo Nursery, Holland Road. It moved to the current site in 1980 and now functions primarily as a tourist attraction. The registration does not cover *T. schlegelli*.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | 763 | 327 | 36 | 144 | 1270 |
| *C.porosus* | 1470 | 630 | 84 | 336 | 2520 |
| *C.siamensis* | - | - | - | - | 6 |
| *C.por x C.sia* | - | - | - | - | - |
| *C.por x C.nov* | - | - | - | - | - |
| *T.schlegelli* | - | - | - | - | 54 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nov | 1980 | 1600 | 1902 | 1998 | - |
| | C.por | 1980 | 1656 | 1891 | 2001 | - |
| Skins produced | C.nov | 1979 | 451 | 449 | 601 | - |
| | C.por | 1979 | 945 | 1050 | 1399 | - |

Source of Information: Questionnaire; Anon., 1990e

## Tan Moh Hong Reptile Skin and Croc Farm

No 790 Upper Serangoon Road, 1953, Singapore

Manager: Tan Gna Chua
Date of Establishment: 01/01/45
Date of Census: 31/12/89
Total Area: 2700m$^2$ (3 breeding ponds, 20 rearing ponds)
Food: Pigs lung and fish from markets

Registered captive-breeding operation (CITES Notification No.610, 31 October 1990). The farm is run as an adjunct to a skin tannery which has been importing reptile skins since 1945. Visitors to the shop are permitted to view the crocodiles kept in small concrete pens to the rear of the premises. Although the first record of breeding was said to be 1952, breeding in recent years has been very limited.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.novaeguineae* | - | 3 | - | - | 3 |
| *C.porosus* | 80 | 600 | 20 | 35 | 735 |
| *T.schlegelii* | - | 20 | - | - | 20 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1952 | - | - | 20 | - |

Source of Information: Questionnaire; Anon., 1990e

Species present: *Crocodylus porosus*

Solomon Islands is not a Party to CITES.

Crocodiles may be taken under licence. To trade in crocodiles with a belly-width of more than 50cm is strictly prohibited as is the export of crocodiles and their parts (under the Fisheries Ordinance No.13 of 1972), unless they have been reared in a registered crocodile breeding farm. This legislation has apparently not been enforced and the wild populations have become seriously depleted.

Messel and King (1989) reported that there were 12 farms in existence varying in size from 1 to 54 animals. However, none was said to be viable and captive breeding was not taking place. The total number of crocodiles seen in the 12 farms was 19 hatchlings, 10 of 2-6ft (0.6-1.8m), and 9 over 6ft in length. They considered that the wild population was so depleted that it would not be able to supply sufficient eggs to support a ranching programme.

A subsequent report (Antram *in litt.* to D. Ulrich, 13 February 1990) indicated that the Solomon Islands Government had approved establishment of a Taiwanese crocodilian farming venture.

**Species present:** *Crocodylus niloticus*

**CITES entered into force in Somalia on 2 March 1986.**

***C. niloticus* was transferred from CITES Appendix I to II on 1 August 1985 under the special criteria set out in Resolution Conf. 5.21, subject to annual quotas. The following quotas were agreed by the Conference of the Parties.**

| Annual quota | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|
| Wild | | 500 | 500 | 500 | 0 | 0 |

**Under the Fauna (Hunting) and Forest Conservation Act of 25 January 1969 the Nile Crocodile could only be taken by holders of a Supplementary Game Licence. A maximum bag limit of two specimens was set. A complete ban on hunting of all wildlife was established by Act No.65 of 13 October 1977. On 26 January 1978 Somalia proclaimed a total ban on hunting. Under the Forestry Conservation Law No.15 of 1989 crocodiles are legally protected. The killing of crocodiles, the collection of eggs and the rearing of young are prohibited (Thorbjarnarson, 1992).**

**There are believed to be no commercial crocodile farms in Somalia.**

Species present: *Crocodylus niloticus*

CITES entered into force in South Africa on 13 October 1975.

In the two provinces where *C. niloticus* still occurs, Natal and the Transvaal, full protection is provided by provincial legislation (Nature Conservation Ordinance 15 of 1974, Transvaal Nature Conservation Ordinance 1983). There is no relevant federal legislation. A proposal to transfer the population to CITES Appendix II was submitted to the 8th meeting of the Conference of the Parties to CITES.

The Nile Crocodile Farmers Association (Riverbend Crocodile Farm, P.O. Box 245, Ramsgate, 2485, South Africa) publishes a newsletter.

There are currently 35 commercial crocodile farms operating in South Africa

The total number of farms, stock and production of crocodiles in South Africa is summarized in the following table.

| Regions | No. Farms | Total Stock of *C.niloticus* | Skin Production | Eggs/juvn from wild | Farm-bred hatchlings |
|---|---|---|---|---|---|
| Bophuthatswana | 2 | 3,742 | 750 | - | 1,550 |
| Cape Province | 6 | 2,276 | 74 | - | 341 |
| Natal | 11 | 11,735 | 1,061 | 359 | 5,553 |
| Orange Free State | 1 | 86 | - | - | - |
| Transvaal | 15 | 14,281 | 2,842 | - | 302 |
| TOTAL | 35 | 32,120 | 4,727 | 359 | 7,746 |

## Kwena Gardens Crocodile Paradise

P.O. Box 234, Sun City, Bophuthatswana, South Africa

Manager: T. Assa
Date of Establishment: 01/01/85
Date of Census: 31/12/89
Total Area: (8 breeding ponds, 10 rearing ponds)
Food: Red meat and chicken from abattoirs and poultry farms

Registered captive-breeding operation (CITES Notification No.453, 28 September 1987). Stock originated from Botswana and Zimbabwe. Member of the Nile Crocodile Farmers Association. Young are reared in hothouses. Stock originated from Okanango (Botswana), Zimbabwe and from hatchlings produced on the farm.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 1500 | 1100 | 26 | 116 | 2742 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1986 | - | 1000 | 1550 | - |
| Skins produced | C.nil | 1988 | 500 | - | 750 | - |

Source of Information: Questionnaire; Anon., 1987b; Kelly pers. comm., 1992

## Manyane Game Lodge and Crocodile Farm

Box 287, Mafikeng, 8670 Bophuthatswana, South Africa

Manager: Johan Marais
Date of Establishment: 01/01/85
Date of Census: 01/01/90
Total Area: (2 breeding ponds, 2 rearing ponds)
Food: Chicken from chicken farms

Registered captive-breeding operation (CITES Notification No.568, 31 January 1990). Stock obtained from captive-bred population in South Africa. Member of Transvaal Crocodile Breeders Association. Hothouses are used for rearing. Meat is sold in the game lodge. To date, skins have been sent to the Cape Province for the tanning and manufacturing of products, which are then sold at Manyane Game Lodge.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 300 | 500 | 40 | 160 | 1000 |

Source of Information: Questionnaire; Anon., 1990b; Marais in *litt.*, 1991.

## African Reptile Park

P.O. Box 30129, Baden Powell Dr, Strandfontein, Tokai 7966 Cape Province, South Africa

Manager: B. Vorster
Date of Establishment: 25/03/84
Date of census: 20/12/91
Total Area: 100 acres (40.47ha), (4 breeding ponds, 2 rearing ponds)
Food: Ox, mutton, rats, mice, chickens from abattoirs, government rodent breeding farm.

Full Member of the Nile Crocodile Farmers Association. Registered captive-breeding operation (CITES Notification No.582, 30 April 1990). Owing to the low temperatures at Cape Town, the breeding operation is to be transferred to Phalabornia to supply hatchlings for rearing at Cape Town which has a better supply of food.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 0 | 23 | 10 | 32 | 65 |

| | Spp. | 1st | 1988 | 1989 | 1990 | 1991 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | - | - | - | - | - |
| Skins produced | C.nil | 1991 | - | - | - | 25 |

Source of Information: Questionnaire; Anon., 1990c; Briggs *in litt.*, 1992

## Cango Crocodile Ranch and Cheetahland

PO. Box 559, Oudtshoorn, Cape Province 6620 Cape Province, South Africa

Manager: Andrew Eriksen (MD)
Date of Establishment: 01/01/77
Date of Census: 31/12/91
Total Area: 6.5 hectares (9 breeding ponds, 5 rearing ponds)
Food: Chickens plus Ostrich and donkey meat from ostrich abattoir and surrounding area

Full member of the Nile Crocodile Farmers Association. Registered captive-breeding operation (CITES Notification No.568, 31 January 1990). Stock was obtained from captive bred populations in Zimbabwe and Natal. This facilities tourist section is located at the Congo Crocodile Ranch, Oudtshoorn, Cape Province, whilst commercial production is carried out in the Province of Natal.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | 8 | 2 | 1 | 11 |
| *C.cataphractus* | 2 | - | - | - | 2 |
| *C.crocodilus* | - | 1 | - | - | 1 |
| *C.niloticus* | 100 | 120 | 10 | 50 | 280 |
| *O.tetraspis* | - | 2 | - | - | 2 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | 1980 | - | 1 | 10 | - |
| | C.nil | 1987 | 110 | 90 | 140 | 50 |
| Skins produced | C.cro | - | - | 20 | 20 | - |

Source of Information: Questionnaire; Anon., 1990b; Briggs *in litt.*, 1992

## George Game Industries (Pty) Ltd

P.O. Box 1683, George 6530 Cape Province, South Africa

Manager: H. Seyer
Date of Establishment: 01/01/84
Date of Census: 31/12/89
Food: Chicken from chicken farms

Full member of the Nile Crocodile Farmers Association. Caiman skin products are also imported for sale at the farm shop.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | - | - | - | - |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1990 | - | - | - | - |

Source of Information: Questionnaire

## Glenashby Crocodile Ranch

Glenashby, P Bag X513, East London 5200, Cape Province, South Africa

Manager: Dr I. Ashby Kirk and D. Kirk
Date of Establishment: 01/01/83
Date of Census: 23/12/91
Total Area: (4 breeding ponds, 4 rearing ponds)
Food: Fowl from chicken farms and beef.

Full member of the Nile Crocodile Farmers Association. Registered captive-breeding operation (CITES Notification No.568, 31 January 1990). Stock originated from captive-bred population in Zimbabwe.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 202 | 30 | 6 | 35 | 273 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1985 | 25 | 104 | 200 | - |
| Skins produced | C.nil | 1989 | - | - | 49 | - |

Source of Information: Questionnaire; Anon., 1990b; Briggs *in litt.*, 1992

## Jeerice/Le bon heur Crocodile Farm

P.O. Box 592, Suider Paarl, 7624 Cape Province, South Africa

Manager: Mrs J. Prins
Date of Establishment: 01/01/86
Date of Census: 20/01/92
Total Area: (7 breeding ponds, 24 rearing ponds)
Food: Chickens produced on farm

Registered captive-breeding operation (CITES Notification No.488, 1 July 1988). Stock was caught from wild populations in Botswana and captive-bred populations in South Africa. Member of the Transvaal Crocodile Breeders Association. Meat is sold at own restaurant. To take advantage of more favourable breeding conditions, the majority of the breeding stock has been moved to warm baths in the Transvaal where a new breeding facility has been established (Kelly pers. comm., 1991).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 456 | 404 | 120 | 560 | 1540 |

Source of Information: Questionnaire; Anon., 1988b; Briggs *in litt.*, 1992; Kelly pers. comm., 1991

## Reptile World

P.O. Box 1849, East London, 5200 Cape Province, South Africa

Manager: Stan Farrell
Date of Establishment: 01/01/82
Date of Census: 31/12/89
Total Area: (3 breeding ponds, 4 rearing ponds)
Food: Bovine foetus, liver and chicken from abattoirs and poultry farms

Full member of the Nile Crocodile Farmers Association.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 56 | 23 | 7 | 32 | 118 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1987 | 55 | 210 | 91 | - |

Source of Information: Questionnaire

# Archosauria Crocodile Farm

P.O. Box 260, Ramsgate, Natal 4285, South Africa

Manager: J.R. Fincham
Date of Census: 31/03/91
Date of Establishment: 11/04/90
Food: Mainly chicken

Full member of the Nile Crocodile Farmers Association. A rearing house was built in 1991. This farm also holds crocodiles for River Bend Crocodile Ranch and Cango Crocodile Ranch.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | - | 8 | 54 | 62 |

| | Spp. | 1st | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1991 | - | - | 127 | 893 |

Source of Information: Kelly *in litt.*, 1990; Blake *in litt.*, 1991

## Assagay Safari Park

PO. Box 73, Bothas Hill, 3660 Natal, South Africa

Manager: Arthur Wilmans
Date of Establishment: 01/01/86
Date of Census: 31/03/91
Total Area: (9 breeding ponds, 11 rearing ponds)
Food: Horse, cattle meat and chickens from local stables, farms

Registered captive-breeding operation (CITES Notification No.610, 31 October 1990). Full member of the Nile Crocodile Farmers Association.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 0 | 278 | 10 | 100 | 388 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1989 | - | - | 93 | 70 |

Source of Information: Questionnaire; Anon., 1990e; Blake *in litt.*, 1991

## Crocodile Creek

P.O. Box 178, Maidstone 4380 Natal, South Africa

Manager: P. and S. Watson
Date of Establishment: 02/09/82
Date of Census: 31/03/91
Total Area: 5 acres (2.02ha), (6 breeding ponds, 28 rearing ponds)
Food: Chicken and 30% red meat from local suppliers

Full member of the Nile Crocodile Farmers Association. Registered captive-breeding operation (CITES Notification No.466, 20 January 1988).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 236 | 336 | 15 | 100 | 687 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1987 | - | - | - | - |
| Skins produced | C.nil | 1989 | - | - | 87 | - |

Source of Information: Questionnaire; Anon., 1990b; Blake *in litt.*, 1991

## Crocworld

Scottburgh, Natal, South Africa

Manager: J. Lello
Date of Establishment: 01/01/84
Date of Census: 31/03/91
Total Area: 10 hectares (5 breeding ponds, 30 rearing ponds)
Food: Horse meat, poultry, pork, beef and fish from vets, abattoirs and fish from pond

Full member of the Nile Crocodile Farmers Association. Registered captive-breeding operation [as Crookes Brothers] (CITES Notification No.453, 28 September 1987).

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | - | 1 | 1 | 2 |
| *C.crocodilus* | - | - | 1 | - | 1 |
| *C.niloticus* | 1942 | 4026 | 29 | 132 | 6129 |
| *O.tetraspis* | - | - | - | 2 | 2 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1987 | 1228 | 1469 | 1975 | 2700 |
| Skins produced | C.nil | 1988 | - | 600 | 800 | - |

Source of Information: Questionnaire; Anon., 1987; Blake *in litt.*, 1991

## Eagles Gorge

P.O. Box 289, Richmond 3780, Natal, South Africa

Manager: C. Walsh
Date of Establishment: 20/03/91
Date of Census: 31/03/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 10 | - | - | - | 10 |

Source of Information: Blake *in litt.*, 1991

## Kennilworth Crocodile Farm

P.O. Box 127, St Lucia Estuary 3936, Natal, South Africa

Manager: D. Blake
Date of Establishment: 26/10/90
Date of Census: 31/03/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | 2 | - | - | 2 |

Source of Information: Blake *in litt.*, 1991

## Pongola Aquaculture

P.O. Box 107, Pongola 3170, Natal, South Africa

Manager: M. Smith
Date of Establishment: 24/09/91
Date of Census: 31/11/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 0 | 30 | - | - | 30 |

Source of Information: Blake *in litt.*, 1991

## River Bend Crocodile Farm / Riverview Farm (Wart Burg)

P.O. Box 245, Ramsgate 4285 Natal, South Africa

Manager: H. and T. Kelly
Date of Establishment: 01/10/81
Date of Census: 31/03/91
Total Area: 4 hectares (7 breeding ponds, 3 rearing ponds)
Food: Beef, pork and other red meat plus chicken (rearing farm)
90% chicken and 10% red meat from surrounding farms (breeding farm)

Full member of the Nile Crocodile Farmers Association. Hatchlings were sold for three years prior to 1991 but since then they will be reared for skins. Application made to CITES for Registration.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 1250 | 54 | 41 | 139 | 1484 |

| | Spp. | 1st | 1988 | 1989 | 1990 | 1991 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1983 | 1290 | 1250 | 1351 | 1296 |

Source of Information: Questionnaire; Blake *in litt.*, 1991

## Shongweni Croc Farm Pty Ltd

PO. Box 350, Hillcrest 3650 Natal, South Africa

Manager: N R Bristow
Date of Establishment: 01/05/86
Date of Census: 31/12/91
Total Area: 34 hectares (8 breeding ponds, 6 rearing ponds)
Food: Red meat

Full member of the Nile Crocodile Farmers Association. Application made to CITES for Registration.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 277 | 652 | 4 | 21 | 954 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1988 | 20 | 10 | 60 | 83 |

Source of Information: Questionnaire; Blake *in litt.*, 1991

## St Lucia Crocodile Centre

P/Bag XO1 St Lucia Estuary, 3936 Natal, South Africa

Manager: D.K. Blake
Date of Establishment: 01/01/75
Date of Census: 31/03/91
Total Area: (6 breeding ponds, 9 rearing ponds)
Food: Antelope - mainly Reedbuck from culling

Associate member of the Nile Crocodile Farmers Association. The centre is run by the Natal Parks Board and serves as an Interpretation Centre. Problem animals are caught from the wild and sold to other farms. Application made to CITES for Registration.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.cataphractus* | - | 7 | 2 | 1 | 10 |
| *C.niloticus* | 726 | 161 | 4 | 18 | 909 |
| *O.tetraspis* | 7 | 2 | 1 | 1 | 11 |
| *A.mississippiensis* | - | 2 | - | - | 2 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.cat | 1986 | - | - | 11 | - |
| | C.nil | 1975 | 330 | 430 | 401 | - |
| | O.tet | 1991 | - | - | 0 | 7 |
| Eggs collected | C.nil | 1989 | - | - | 359 | - |
| | C.cat | - | - | 371 | 677 | 648 |

Source of Information: Questionnaire; Blake *in litt.*, 1991

## Stewart's Farm

P.O. Box 4, Nkwalini, 3816 Natal, South Africa

Manager: G.R.C. Stewart
Date of Establishment: 30/06/81
Date of Census: 31/03/91

Registered captive-breeding operation (CITES Notification No.362, 19 September 1985). Stock bought from a captive-breeding operation at St Lucia. Member of the Nile Crocodile Farmers Association.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 104 | 847 | 7 | 10 | 1122 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | - | 318 | 288 | 185 | 104 |
| Skins produced | C.nil | 1985 | - | - | 174 | - |

Source of Information: Anon., 1895c; Blake *in litt.*, 1991

## Diggies Croc Ranch

P.O. Box 1476, Kimberly, 8300, Orange Free State, South Africa

Manager: L. de Jongh
Date of Establishment: 15/12/89
Date of Census: 01/08/90
Total Area: 2 hectares (4 breeding ponds, 1 rearing pond)
Food: Beef and chicken from abattoir and chicken farm

Full member of the Nile Crocodile Farmers Association.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 34 | 29 | 5 | 18 | 86 |

Source of Information: Questionnaire

## Altah Croc Farm

Buisfontein Farm, PO. Box 10578, Aston Manor 1630, Warmbath, Transvaal, South Africa

Manager: Albert Pretorius
Date of Establishment: 18/09/88
Date of Census: 30/11/91
Total Area: 31 hectares (1 breeding pond, 1 rearing pond)
Food: Pork, beef and chicken from farms

Full member of the Nile Crocodile Farmers Association. The stock was originally obtained from captive-breeding operations in South Africa. Registered captive-breeding operation (CITES Notification No.669, 16 January 1992). The farm intends to produce 8000 skins over a five year period (1992-1997).

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | 1300 | 177 | 16 | 77 | 1570 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Skins produced | C.nil | 1989 | - | - | 42 | - |

Source of Information: Questionnaire; Anon., 1992

## Crocgrove Farm

P.O. Box 112, Schagen 1204 Transvaal, South Africa

Manager: Des Slogrove
Date of Establishment: 01/05/82
Date of Census: 31/12/89
Total Area: 105 hectares (7 breeding ponds, 12 rearing ponds)
Food: Breeders - chickens, beef and fish; hatchlings - minced liver and carcass meal

Full member of the Nile Crocodile Farmers Association. Registered captive-breeding operation (CITES Notification No.377, 16 January 1986). Stock was obtained from Namibia.

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | 300 | 150 | 14 | 61 | 525 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Captive breeding | C.nil | 1983 | 500 | - | 300 | - |

Source of Information: Questionnaire; Anon., 1986a

## Crocovango

P.O. Box 65626, Benmore 2010 Transvaal, South Africa

Manager: A. Calcaterra
Date of Establishment: 01/01/89

Member of the Transvaal Crocodile Breeders Association. Hothouses have been installed. Breeding stock estimated at 350 female *C. niloticus*.

Source of Information: Kuhlmann *in litt.*, 1990

## Emfuleni Game & Crocodile Ranch

P.O. Box 752, Guernsey, Hoedspruit, 1380 Transvaal, South Africa

Manager: Theodore Torre
Date of Establishment: 01/01/88
Total Area: 700 hectares (4 breeding ponds, 2 rearing ponds(h/h))
Food: Meat from slaughter-house

Registered captive-breeding operation (CITES Notification No.568, 31 January 1990). Stock originated from 10 wild-caught specimens from Botswana and captive-bred populations in South Africa. Member of the Transvaal Crocodile Breeders Association.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 400 | 150 | 30 | 200 | 780 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1989 | - | - | - | - |
| Skins produced | C.nil | 1990 | - | - | - | - |

Source of Information: Anon., 1990b

## Hughes Farms CC

P.O. Box 902.045, Bon Accord, 0009 Pretoria Transvaal, South Africa

Manager: Lynette Hughes
Date of Establishment: 01/06/88
Date of Census: 31/12/89
Total Area: 300 hectares
Food: Pig meat from own piggery

No crocodiles are bred on the farm, but stock is purchased from other farms for on-growing.

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | 1400 | 400 | - | - | 1800 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Skins produced | C.nil | 1989 | - | - | 600 | - |

Source of Information: Questionnaire

## Izintaba Crocodile Farm

De Wildt, near Pretoria, Transvaal, South Africa

Manager: Jan-Gerd Kuhlman
Date of Establishment: 23/01/68
Date of Census: 31/12/89
Total Area: 40 hectares (4 breeding ponds, reared in hothouse)
Food: Chickens for breeders and pelleted food for young

Registered captive-breeding operation (CITES Notification No.377, 16 January 1986). Stock caught from wild population in 1968 (pre-Convention). Member of the Transvaal Crocodile Breeders Association. Young are reared in hothouses.

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | - | - | 90 | 450 | 540 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Captive breeding | C.nil | 1970 | - | - | - | - |
| Skins produced | C.nil | 1978 | - | - | - | - |

Source of Information: Questionnaire; Anon., 1986a

## Kroonkrok

P.O. Box 9, Kroondal, 0350 Transvaal, South Africa

Manager: Dr H.O. Penzhorn
Date of Establishment: 01/02/82
Date of Census: 01/12/90
Food: Red meat from abattoirs

Registered captive-breeding operation (CITES Notification No.362, 19 September 1985). Stock bought from farms in Zimbabwe. Member of the Transvaal Crocodile Breeders Association. Juveniles are grown in heated hothouses. Meat is sold to local restaurants.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 2600 | 1200 | 50 | 300 | 5150 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1985 | - | - | - | - |
| Skins produced | C.nil | 1986 | - | - | - | - |

Source of Information: Questionnaire; Anon., 1895c

## Laughing Waters Pineries Krokodilplaas

Private Bag 557, Hectorspruit, 1330 Transvaal, South Africa

Manager: J.C. Rousseau
Date of Census: 31/12/89
Total Area: 1064m² (2 breeding ponds)
Food: Fowls from chicken farms and donkeys reared on farm

Full member of the Nile Crocodile Farmers Association.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | - | 23 | 122 | 145 |

Source of Information: Questionnaire

## Lebowa Crocodile Ranch

P.O. Box 951, Pietersberg, 0700 Transvaal, South Africa

Date of Establishment: 01/12/84

Registered captive-breeding operation (CITES Notification No.421, 28 November 1986). Stock was obtained from South Africa (wild and captive-bred populations), Zimbabwe and Botswana. Full member of the Nile Crocodile Farmers Association.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | - | - | - | - |

Source of Information: Anon., 1986c; Kelly pers. comm., 1992

## Neos Estate, Malelane

61 Union St, Riviera 0084 Transvaal, South Africa

Manager: Dr G.B. von Berg
Date of Establishment: 01/07/90
Date of Census: 01/08/90
Total Area: (1 breeding pond)
Food: Chicken from local chicken farmers

Full member of the Nile Crocodile Farmers Association. This is the second farm on Neos Estate, having taken over part of the original operation in 1990.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | - | 7 | 43 | 50 |

Source of Information: Questionnaire

## Neos Estate/Lomati Estates

Private Bag 543, Hectorspruit, 1330 Transvaal, South Africa

Manager: Mynhardt Schoeman
Date of Establishment: 01/01/83
Date of Census: 01/09/90
Total Area: (2 breeding ponds, 1 rearing pond)
Food: Chicken from poultry farms

Full member of the Nile Crocodile Farmers Association; also a member of the Transvaal Crocodile Breeders Association. Registered captive-breeding operation (CITES Notification No.377, 16 January 1986). Stock was obtained from Zimbabwe.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | 60 | 13 | 124 | 197 |

Source of Information: Questionnaire; Anon., 1986a

## Seronera Croc Farms

P.O. Box 4, Hazyview 1242 Transvaal, South Africa

Manager: J.V. Davies
Date of Establishment: 01/07/90
Date of Census: 31/12/89
Total Area: 43 hectares (3 breeding ponds)
Food: Chicken from local farms

Full member of the Nile Crocodile Farmers Association.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | 136 | - | - | 136 |

Source of Information: Questionnaire

## Sutton Crocodile Farm

P.O. Box 16, Rondebult 1423, Transvaal, South Africa

Manager: S.J.L. Roberts
Date of Establishment: 05/09/89
Date of Census: 31/03/91
Food: Cattle and game

Full member of the Nile Crocodile Association. Application made to CITES for Registration.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | 398 | 10 | - | 408 |

Source of Information: Blake *in litt.*, 1991

## Tzaneen Crocodile Farm

No.80 Jacobson Drive, Lunnwood Ridge, Pretoria 0081, Transvaal, South Africa

Manager: Milan Darazs
Date of Establishment: 01/01/82
Date of Census: 31/12/89
Total Area: (3 breeding ponds, 6 rearing ponds)
Food: Chicken and pigs from farms

Registered captive-breeding operation (CITES Notification No.599, 31 July 1990). Member of the Transvaal Crocodile Breeders Association. Stock originates from South Africa and Zimbabwe (Anon., 1990d).

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | 58 | 140 | 7 | 25 | 230 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Captive breeding | C.nil | 1986 | 2 | 2 | - | - |

Source of Information: Questionnaire; Anon., 1990d

## Willers & Willers Croc Ranch

P.O. Box 34035, Erasmia 0023 Transvaal, South Africa

Manager: A. Willers
Date of Establishment: 01/01/87
Date of Census: 30/08/90
Total Area: 1000 hectares (6 rearing ponds)
Food: Pig meat produced on farm

Full member of the Nile Crocodile Farmers Association. Registered captive-breeding operation (CITES Notification No.599, 31 July 1990). This farm buys in and rears hatchlings from other farms.

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | 1500 | 1300 | - | - | 2800 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Skins produced | C.nil | 1988 | - | 1000 | 2200 | - |

Source of Information: Questionnaire; Anon., 1990d

**Species present:** None native

A crocodile farm (Cortijo de Frias) was provisionally approved at Jerez de la Frontera (Cadiz) in 1988, but final approval was withheld because the installations did not correspond with the plans presented. The farm subsequently made an application to import crocodiles from Zambia but this was refused and the crocodiles were returned.

**Source of Information:** Jiménez *in litt.*, 1991

Species present: *Crocodylus palustris*
*Crocodylus porosus*

CITES entered into force in Sri Lanka on 2 August 1979.

These species are protected under the Fauna and Flora Protection Ordinance of 1938. Hunting is prohibited except under licence; only single specimens of *C. porosus* may be taken. The regulations also include provisions governing the issuance of permits for exports. Traders in animals are required to possess a licence.

There are believed to be no commercial crocodile farms in Sri Lanka.

Species present: *Crocodylus niloticus*

CITES entered into force in Sudan on 24 January 1983.

*C. niloticus* was transferred from CITES Appendix I to II on 1 August 1985 under the special criteria set out in Resolution Conf. 5.21, subject to annual quotas. The following quotas were agreed by the Conference of the Parties.

| Annual quota | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|---|
| Wild | 5000 | 5000 | 5000 | 5000 | 5040 | 0 | 8000 |

The Preservation of Wild Animals Ordinance 1936 sets bag limits and also a grading system for export of reptile skins. In 1970 the crocodile was listed in Schedule II of the Ordinance and thereafter could only be hunted under licence. On 1 January 1989 a complete ban on hunting and capturing of all animals came into effect (in accordance with Articles 4, 17 and 21 of the Preservation of Wildlife and National Parks Law). It was intended to last for three years, in order to allow a full review of the over-exploited wildlife of Sudan. In 1991 the Government submitted a proposal to CITES for an export quota of 8000 skins for 1992 to export skins "legally hunted in 1990", explaining that crocodiles had been excluded from the hunting ban in 1989. Hunting of wild crocodiles was said to have ended in 1991. The quota was accepted but for a limited period of 30 days (13 June-13 July 1992), after which the population was transferred to Appendix I.

A crocodile farm (El Faki) was built in 1991 and obtained 96 crocodiles captured from the wild (Anon., 1991g).

**Species present:** *Caiman crocodilus*
*Melanosuchus niger*
*Palaeosuchus palpebrosus*
*Palaeosuchus trigonatus*

CITES entered into force in Suriname on 15 February 1981.

The Suriname Game Law 1954 (last amended 1982) controls the hunting and killing of crocodilians in the north of the country. The two *Palaeosuchus* species are designated as protected species (Game Resolution 1970, Government Gazette No.104), but *Caiman crocodilus* may be hunted. The total number of skins produced from 1987 to 1989 was 294, 309 and 268 for the three years, respectively. There are no crocodilian farms in Suriname (Malone *in litt.*, 1990).

Species present: *Crocodylus niloticus*

Swaziland is not a Party to CITES.

The Game Act of 1 September 1953 offers some protection for the Nile Crocodile, but it is not included as a game species. The principal veterinary officer is authorized to issue permits for exportation of wild skins.

There are believed to be no commercial crocodile farms in Swaziland.

Species present: None native

The previous edition of the Crocodile Farming Directory (Luxmoore *et al.*, 1985) noted 35 farms with a total stock of about 8000 *Caiman crocodilus*, 300 "*Gavialis gangeticus*" (probably *Tomistoma schlegelii*) and 300 *Crocodylus porosus*. Recent information suggests that there may now be some 20 crocodile farms in Taiwan, producing about 20 tonnes of meat a year, which is equivalent to slaughtering about 2000 *Caiman crocodilus*. Most of the stock was imported from South America but imports of live Caiman were curtailed in 1989. Meat is the main product of the farms, three year old Caiman producing around 9kg each. Skins are also sold and tanned locally (Hutton *in litt.*, 1992).

## Far East Crocodile Farm

Taiwan

Manager: Wong
Date of Census; 24/03/92

The farm is mainly for the production of meat, about 10 tonnes being produced annually. Most of the *C. crocodilus* were imported from Colombia although there were a few from Paraguay. The *C. porosus* were imported from Indonesia and the Philippines around 1985. Since the restriction on imports imposed in 1989 attempts have been made to breed caiman on the farm but the success rate has been low.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | - | - | 4000 |
| *C.porosus* | - | - | - | - | 50 |

| | Spp. | 1st | 1988 | 1989 | 1990 | 1991 |
|---|---|---|---|---|---|---|
| Captive breeding | C.cro | - | - | - | - | 200 |
| Skins produced | C.cro | - | - | - | - | c. 1000 |

Source of Information: Hutton *in litt.*, 1992

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*

CITES entered into force in Tanzania on 27 February 1980.

*C. niloticus* was transferred from CITES Appendix I to II on 1 August 1985 under the special criteria set out in Resolution Conf. 5.21, subject to annual quotas. The following quotas were agreed by the Conference of the Parties. At the 8th meeting of the Conference of the Parties to CITES (1992) the population was retained in Appendix II under the conditions of Resolution Conf. 3.15 on ranching; however, Tanzania undertook to adhere to a quota for skins harvested from the wild declining from 400 in 1992 to 100 in 1995.

| Annual quota | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|---|---|
| Wild | 1000 | 2000 | 2000 | 2000 | 100 | 100 | 400 | 200 | 200 |
| Ranched | | | | | | 4000 | 6000 | | |

Wildlife Conservation Act (National Game) Order of 31 October 1974 gives full protection. Possession of wildlife and wildlife trophies, imports and exports are subject to licence.

There are believed to be six commercial farms in Tanzania.

## Hambo Crocodile Village

P.O. Box 70235, Dar es Salaam, Tanzania

Manager: H. Mbuguli
Date of Establishment: 31/12/90

Located 20km north of Dar es Salaam. Hatchlings and eggs have been collected in the Rufiji Basin. The target capacity for the farm is for an intake of 3000 hatchlings a year. The first phase of construction, including cold storage and ponds for 1000, is complete.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 300 | 1000 | 4 | 6 | 1310 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.nil | - | - | - | - | 300 |
| Hatchlings collected | C.nil | - | - | - | - | 1060 |

Source of Information: Bruessow, 1991; Okudo *in litt.*, 1991; Severre pers. comm., 1992

## Kaole Mamba Ranch

P.O. Box 20364, Dar es Salaam Bagamoyo, Tanzania

Manager: Sarawani
Date of Establishment: 01/01/91

Reported as being in the final stage of construction in October 1991. Eggs are collected along the Ruvu and Pangani Rivers.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 1300 | 10 | - | - | - |

Source of Information: Okudo *in litt.*, 1991; Severre pers. comm., 1992

## Masasi Crocodiles

P.O. Box 6037, Dar es Salaam Ikwiriri, Tanzania

Manager: A.S. Masasi
Date of Establishment: 01/01/91

Reported as being in the final stage of construction in October 1991.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | - | - | - | - |

Source of Information: Okudo *in litt.*, 1991

## Teule Crocodiles

P.O. Box 3865, Dar es Salaam, Rufiji, Tanzania

Manager: M. Mangu'lo

Located at Ifakara, 450km south-west of Dar es Salaam. Planned capacity was 2000, but construction was reported to have halted in December 1990 owing to financial constraints. Eggs are collected along the Kilombero and Ruaha rivers.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 210 | 50 | - | - | 260 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | - | - | - | - | 300 |
| Eggs collected | C.nil | - | - | - | - | 100 |

Source of Information: Bruessow, 1991; Okudo *in litt.*, 1991; Severre pers. comm., 1992

## Tumaini Craft Crocodiles

P.O. Box 60288, Dar es Salaam (Rufiji), Tanzania

Manager: D.C. Nandena
Date of Establishment: 13/12/90

Located 5km from the Teule project (q.v.). The farm has a planned capacity of 1500 hatchlings a year. Eggs are collected along the Ruaha and Rufigi rivers.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 502 | 511 | - | - | 1013 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.nil | - | - | - | - | 600 |
| Hatchlings collected | C.nil | - | - | - | - | 570 |

Source of Information: Bruessow, 1991; Okudo *in litt.*, 1991; Severre pers. comm., 1992

## Rhino Holding Crocodiles

P.O. Box 3949, Dar es Salaam, Lake Rukwa, Rukwa, Tanzania

Manager: Chief L.P.D Ngua
Date of Establishment: 01/01/91

Reported as being in the final stage of construction in October 1991.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | - | - | - | - |

Source of Information: Okudo *in litt.*, 1991

Species present: *Crocodylus porosus*
*Crocodylus siamensis*
*Tomistoma schlegelii*

CITES entered into force in Thailand on 21 April 1983, taking reservations on *C. porosus* and *C. siamensis*. These were withdrawn on 17 August 1987.

Under the Wild Life Conservation Act 1992 (replacing the Wild Animals Reservation and Protection Act (1960, amended 1972)) animal species are divided into two categories: Protected Species and Endangered Wildlife. Protected Species include the CITES Appendix listings. The Act will provide Thai authorities with the legal means to implement the CITES Convention.

**Article 20** states that no trade in wildlife is permissible unless derived from captive-breeding operations.
*C. siamensis* and *C. porosus* are included in a tentative list of species which may be captive-bred in accordance with Article 20.

**Article 24** specifically defines the inclusion of CITES Appendices into the legislation.

There are more than 200 crocodile farms located throughout much of central and southern Thailand, ranging from small village-scale operations with fewer than 10 animals up to farms with many thousands. Only one farm is currently registered with the CITES Secretariat as a captive-breeding operation (Samutprakan), but several other farms are currently seeking approval. There is an extensive trade in live crocodiles within the country, some farms specialising in the production of hatchlings for sale to other farms. The Crocodile Management Association of Thailand was formed in 1991 to coordinate the farming industry and ensure that the commercial use is consistent with the requirements of CITES (Webb and Jenkins, 1991b). (Dr Parntep Ratanakorn, President, Crocodile Management Association of Thailand, Faculty of Science, Kasetsart University, P.O. Box 9-1020, Bangkok 10900)

The following account gives details of all of the major farms and a selection of the smaller ones.

## Chom Thong

39/2 Moo 4 Chom Thong, Bangkok, Thailand

Manager: Roengsit Marutanond
Date of Establishment: 01/01/87
Date of Census: 01/08/91
Total Area: 0.75 acres (0.30), (5 breeding ponds, 17 rearing ponds)
Food: Chicken carcasses and marine fish from market

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.crocodilus* | - | 1 | - | - | - |
| *C.porosus* | 59 | 15 | - | - | - |
| *C.siamensis* | 12 | 111 | 4 | 4 | 131 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.sia | 1988 | - | - | - | - |

Source of Information: Questionnaire

## Thai Chiang Saen Crocodile Farm

43 Moo 6 Soi Sukapibal 5, Kwaeng Or-Ngoen, Khet Bangkhen Bangkok, Thailand

Manager: Wiwat Rung Sathienmethakul
Date of Census: 31/08/91
Total Area: 5 acres (2.02ha), (1 breeding pond, 6 rearing ponds)
Food: Fish and chicken carcasses from market

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.porosus* | - | - | - | - | 12 |
| *C.siamensis* | - | - | - | - | 162 |

Source of Information: Ratanakorn *in litt.*, 1991

## Wat Singh Crocodile Farm

121 Moo 3, Makamtau, Wat Singh, Chainat Province, Thailand

Manager: Wasan Imwoodthikul
Date of Establishment: 09/01/76
Date of Census: 01/01/88
Total Area: 40 acres (16.19ha), (60 breeding ponds, 35 rearing ponds)
Food: Fish and chicken carcasses from markets and fishing

The farm specialises in breeding *C. siamensis* for sale to other farms as hatchlings (7 days-3 months). Some adults are subsequently repurchased and kept until they reproduce whereupon they can be sold as proven breeding pairs. Said to have been established in 1937, most of the original stock having been obtained from Bung-borapet.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.siamensis* | 300 | 1000 | 300 | 350 | 1950 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.sia | 1979 | 300 | 450 | 600 | - |

Source of Information: Questionnaire; Ratanakorn *in litt.*, 1991; Webb and Jenkins, 1991b

## Pricha Crocodile Farm

6 Soi 6 Srichan Rd, Tambol Watmai Chanbori, Thailand

Manager: Pricha Charoensap
Date of Census: 17/09/91
Total Area: 5 acres (2.02ha), (1 breeding pond, 3 rearing ponds)
Food: Fish and chicken carcasses from market

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | - | - | - | - | 51 |
| *C.siamensis* | - | - | - | - | 153 |
| *Gavialis gangeticus* | - | - | - | - | 2 |

Source of Information: Panachamananda *in litt.*,1991

## Sriracha Farm Co. Ltd.

PO. Box 16, Sriracha, Cholburi, Thailand

Manager: Maitree Temsiriphong
Date of Census: 31/12/89
Total Area: (5 breeding ponds, 21 rearing ponds)
Food: Chickens and fish from the local market; also vitamins and minerals

Most of the stock derives from small village farms in eastern Thailand close to the Cambodian border. The *C. porosus* were bought from a farm on Phuket Island which had reportedly been breeding the species for 20 years.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | - | 60 | 15 | 45 | 120 |
| *C.siamensis* | 91 | 2811 | 1686 | 1125 | 5713 |
| *Caiman crocodilus* | - | 16 | 9 | 7 | 32 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.sia | 1989 | - | - | 43 | - |
| | C.cro | 1989 | - | - | 4 | - |

Source of Information: Questionnaire; Kaeokamnerd *in litt.*, 1992; Webb and Jenkins, 1991b

## Crocodile Farm Pataya Company Ltd

22/1 Moo 1, Nong Plalai, Bang Lamung, 20150 Chonburi, Thailand

Manager: Suan Phanomwathanakul
Date of Establishment: 01/01/82
Date of Census: 09/08/90
Total Area: 31 acres (12.54ha), (1 social pond)
Food: Fish and chicken carcasses

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | - | 20 | - | - | 20 |
| *C.siamensis* | - | - | 98 | 197 | 445 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.sia | 1991 | - | - | - | - |
| Eggs collected | C.por | - | - | - | - | - |

Source of Information: Ratanakorn *in litt.*, 1991

## Chonburi Crocodile Farm, Zoo and Resort

135 Moo 2, Khao Zock, Nong Yai, Chonburi Province, Thailand

Manager: Somchai Koknutaporn
Date of Establishment: 15/08/71
Date of Census: 04/12/90
Total Area: 2300 acres (930.80ha)
Food: Chicken, duck, fish and pig from the general market

The initial stock was purchased from a farm in Nakorn Sawan in 1971. Live hatchlings have been sold to other farms and skin production is expected in 1992.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.crocodilus* | 4 | - | - | - | - |
| *C.porosus* | 13 | - | - | - | - |
| *C.siamensis* | 564 | 1792 | 21 | 21 | 2398 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.sia | 1984 | 456 | 573 | 564 | - |

Source of Information: Questionnaire; Ratanakorn *in litt.*, 1991; Webb and Jenkins, 1991b

## Nakorn Luang Farm

58-59 Yoothasart Road, Banbung, Chonburi Province, Thailand

Manager: Boochop Aksorn
Date of Establishment: 01/06/88
Date of Census: 22/01/91
Total Area: 32 acres (12.95ha), (5 breeding ponds, 39 rearing ponds)
Food: Chicken carcasses from own farm

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.crocodilus* | 5 | 2 | 1 | 1 | 9 |
| *C.porosus* | 52 | 7 | - | - | 59 |
| *C.siamensis* | 18 | 669 | 208 | 192 | 1277 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.cro | 1990 | - | - | - | 5 |
| | C.por | 1990 | - | - | - | - |
| | C.sia | 1990 | - | - | - | 20 |

Source of Information: Questionnaire

## Samphran Crocodile Farm Co. Ltd.

117 Moo 6 Petchakasem Rd., Km30, Takam, Samphran, Nakorn Pathom, Thailand

Manager: Pichai Chaimongkoltrakul
Date of Establishment: 30/10/63
Date of Census: 31/01/91
Total Area: 52 acres (21ha), (18 breeding ponds, 51 rear/nursery pond)
Food: Chicken, pig carcass and freshwater fish from farms, abattoir and markets

The farm is located next to the popular Rose Garden and functions as a major tourist venue, offering a variety of subsidiary attractions. Most of the stock was purchased from farms in Nakorn Sawan. Stock is regularly exchanged with Wat Singh Farm. In 1991, 440 *C. siamensis* were hatched from 72 nests. The *C. porosus* were purchased from Wat Singh in 1980, having been caught in Ranong Province. The *T. schlegelii* were bought from Siam Farm and the *C. crocodilus* from another animal dealer in Bangkok.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | 38 | - | - | 38 |
| *C.porosus* | 17 | 500 | 6 | 100 | 623 |
| *C.siamensis* | 269 | 3500 | 100 | 450 | 4319 |
| *Tomistoma schlegelii* | - | 12 | 6 | 6 | 24 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.cro | 1991 | - | - | - | - |
| | C.por | 1989 | - | - | 51 | 100 |
| | C.sia | 1973 | - | - | 120 | - |
| Skins produced | C.sia | 1968 | - | - | - | - |

Source of Information: Questionnaire; Kaeokamnerd *in litt.*, 1992; Ratanakorn *in litt.*, 1991; Webb and Jenkins, 1991b

## Pornchai Feed Mill

99 Moo 4 Talad Coak Sawai, Tumbol Saiau, Nonthai, Nakornrachasima Province, Thailand

Manager: Pichan Pornchaiyapruk
Date of Establishment: 29/08/89
Date of Census: 31/12/89
Total Area: 2 acres (0.81ha), (2 breeding ponds, 2 rearing ponds)
Food: Chicken carcasses from markets

In August 1989, 186 *C. siamensis* were bought from other farms.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.siamensis* | 2 | 4 | ----(186)---- | | 192 |

Source of Information: Questionnaire

## Tanongsak Crocodile Farm

423 Chao Sam-ang Road, Kabinburi, Prachinburi Province, Thailand

Manager: Wirat Tanongsakmontri
Date of Establishment: 29/03/88
Date of Census: 01/01/91
Total Area: 2 acres (0.81ha), (3 breeding ponds, 8 rearing ponds)
Food: Chicken and fish from a farm and market

Some of the *C. siamensis* (70 four-year-olds, and 250 three-year-olds) were said to have come from Cambodia (presumably collected from the wild). The remaining 52 seven-year-old *C. siamensis* derived from Thailand and were probably bought from farms.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.siamensis* | - | 320 | 22 | 30 | 372 |

Source of Information: Questionnaire; Ratanakorn *in litt.*, 1991

## Samutprakan Crocodile Farm & Zoo Co Ltd

555 Taiban Road, Samutprakan, Thailand

Manager: Utai Youngprapakorn
Date of Establishment: 01/01/50
Date of Census: 01/03/91
Total Area: 150 acres (0.40ha), (13 breeding ponds, 254 rearing ponds)
Food: Fish, chicken, and pork from chicken farms and factories

Registered captive-breeding operation (CITES Notification No.349, 23 July 1985) for *C. siamensis* and *C. porosus*. The farm functions as a major tourist attraction offering a wide variety of other facilities. An additional site is being developed at Bang Pakong to hold approximately 1500 breeding animals.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | - | 1 | 1 | 2 |
| *A.sinensis* | - | - | 1 | 1 | 2 |
| *C.crocodilus* | 27 | - | 16 | 10 | 53 |
| *C.novaeguineae* | - | - | 2 | 1 | 3 |
| *C.porosus* | 1431 | 3686 | 290 | 540 | 5947 |
| *C.rhombifer* | 12 | 3 | 1 | 2 | 18 |
| *C.siamensis* | 3756 | 8170 | 1366 | 2104 | 15396 |
| *C.siamensis* x *C.porosus* | 703 | 2694 | 137 | 242 | 3776 |
| *Tomistoma schlegelii* | - | - | 39 | 39 | 78 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.cro | - | 1525 | 548 | 47 | - |
| | C.por | 1960 | 2275 | 1020 | 1485 | - |
| | C.rho | 1988 | - | 22 | 15 | - |
| | C.sia | 1953 | 3645 | 3105 | 3876 | - |
| | C.sxp | - | 850 | 787 | 732 | - |
| Eggs collected | C.por | 1950 | - | - | - | - |
| Skins produced | C.por | 1960 | 400 | 300 | 200 | - |
| | C.sia | 1960 | 830 | 2200 | 2700 | - |
| | C.sxp | - | - | - | 100 | - |

Source of Information: Questionnaire; Anon., 1985b; Ratanakorn *in litt.*, 1991; Webb and Jenkins, 1991b

## Prasit Osoth

322 Moo 10 Suwannasorn Road, Wiharn Dang, Saraburi Province, Thailand

Manager: Banchurd
Date of Establishment: 12/10/78
Date of Census: 31/12/89
Total Area: 1 acre (1 breeding pond, 1 rearing pond)
Food: Chicken carcasses from a chicken processing plant

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | 1 | - | - | 1 |
| *C.porosus* | - | - | - | - | - |
| *C.siamensis* | 96 | - | 49 | 77 | 222 |
| *T.schlegelii* | - | 1 | - | - | 1 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.sia | - | - | - | 128 | - |

Source of Information: Questionnaire

## Subsanoon Farm

131 Moo 5, Subsanoon, Muag Lek, Saraburi Province, Thailand

Manager: Sirisak Isarangkul
Date of Establishment: 21/07/89
Date of Census: 01/02/91
Total Area: 4 acres (1.62ha), (2 breeding ponds, 5 rearing ponds)
Food: Chicken carcasses from own farm

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.porosus x siamensis* | - | - | 41 | 56 | 97 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.por | 1990 | - | - | - | 1 |

Source of Information: Questionnaire; Ratanakorn *in litt.*, 1991

## Unus Crocodile Farm

162/1 Tha-Chang Road, Tambol Tha-Chang, Amphur Muang Uthai Thani Province,

Manager: Unus Sawamiphak
Date of Census: 31/12/89
Total Area: 2 acres (0.81ha), (1 breeding pond, 6 rearing ponds)
Food: Chicken carcasses from market

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.siamensis* | - | - | - | - | 110 |

Source of Information: Ratanakorn *in litt.*, 1991

## Crocodile Farm

Moo 6 Nong Yang, Nong Chang, Uthaithani Province, Thailand

Manager: Dumrong Noparat
Date of Census: 01/04/91
Total Area: 10 acres (4.05ha), (11 breeding ponds, 51 rearing ponds)
Food: Chicken, fish, pork and frogs from the local market

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.porosus* | - | - | 3 | 7 | 10 |
| *C.siamensis* | 177 | 628 | 29 | 48 | 882 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.sia | 1985 | 329 | 558 | 790 | - |

Source of Information: Questionnaire; Ratanakorn *in litt.*, 1991

## Uthai Color Lab Farm

2 Moo 1 Sakaekrung, Muang, Uthaithani Province, Thailand

Manager: Amorn
Date of Establishment: 09/01/66
Date of Census: 01/04/91
Total Area: 2.5 acres (1.01ha), (2 breeding ponds, 6 rearing ponds)
Food: Chicken and fish from the local market

The farm sells hatchlings rather than skins, having first done so in 1973.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.porosus* | 10 | - | - | - | 10 |
| *C.siamensis* | 36 | 16 | 10 | 22 | 84 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.sia | 1973 | 171 | 170 | 184 | - |

Source of Information: Questionnaire

**Species present:** *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

Togo is a Party to CITES; the Convention entered into force on 21 January 1979.

All three are listed as predatory species in Togo under the *Ordonnance réglementant la protection de la faune et l'exercice de la chasse* of 16 January 1968. They may be killed at all times in inhabited and farming areas. The use of firearms to kill crocodiles in these areas is limited except to holders of valid hunting licences (Decree No.79-139 of 17 May 1979). In Game Management areas crocodiles are Game Species and may only be taken by holders of valid licences. The exportation of all wild animals requires a permit.

There are believed to be no commercial crocodile farms in Togo.

Species present: *Crocodylus niloticus*
and possibly *Osteolaemus tetraspis*

CITES entered into force in Uganda on 16 October 1991.

The Fish and Crocodiles Act of 1951 provides for the requirement of a licence for the taking of crocodiles and prohibits the possession of illegally taken crocodiles and their skins. Crocodiles that have been taken illegally, killed by accident, in self-defence or defence of property, and crocodiles found dead are the property of the Government. Skin exports were suspended in 1974 for a period of five years, and this suspension appears to have been extended into the early 1980s (Anon., 1991h).

Exports of all wildlife products were suspended in 1991 (Gezahegen, 1991). A proposal was submitted to the 8th meeting of the Conference of the Parties to CITES to transfer the populations to Appendix II.

There is believed to be only one commercial crocodile farm in Uganda.

## Uganda Crocs Limited (Katebo)

P.O. Box 9374, Kampala, Uganda

Manager: Robert Oluoch
Date of Establishment: 31/01/91
Date of Census: 24/07/91
Total Area: (15 rearing ponds)
Food: Fish and occasional red meat; planning to fish for 'Mukene', which is high in nutrients

A permit was issued to the farm on 31 January 1991 from the Uganda National Parks Department. The farming operation will constitute 'Crocodile Ranching' under the terms of CITES Conference Resolution 3.15 (1982) and will be dependent on collection of eggs from the wild population for the initial 10-year period. Under the terms of the permit the farm may collect 4000 eggs annually along the banks of the Nile, supervised by the Chief Warden of the Park; live crocodiles must not be collected. Of juvenile crocodiles measuring 1.2-1.3m long, 5% must be returned to the National Parks. The hatchling ponds are heated and there is an environmentally controlled house. An annual skin production quota of 2500 has been requested. A total of 4020 were collected and incubated in 1991, of which 3483 hatched successfully.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 3483 | - | - | - | 3483 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.nil | 1991 | - | - | - | - |

Source of Information: Anon., 1991h; Anon, 1992d; Babitunga *in litt.*, 1991

Species present: *Caiman latirostris*

CITES entered into force in Uruguay on 1 July 1975.

Under *Ley* No.9.481 of 4 July 1935, the hunting, transport and commercialization of indigenous wildlife and wildlife products are banned in Uruguay. *Decreto* 261/978 of 10 May 1978 implements and reinforces that ban, with limited exemptions such as hunting or exporting for scientific or educational purposes, or if the species is considered harmful. *C. latirostris* is fully protected.

There are no commercial crocodilian farms in Uruguay but the Instituto Nacional de Pesca is engaged in research on *Caiman latirostris* at the Fish Culture Centre, Villa Constitución, Salto. There is an important local wild population in the area and research on captive-breeding techniques was proposed (Parodi *in litt.*, 1987).

Species present: *Caiman latirostris*
*Alligator mississippiensis*
*Crocodylus acutus*

CITES entered into force in the USA on 1 July 1975.

*A. mississippiensis* was initially classed as endangered under the Endangered Species Act of 1973. The population sizes are now sufficient to allow controlled exploitation in the states of Florida, Louisiana, South Carolina and Texas. The species is also protected by state legislation (see below).

*C. acutus* has full protection under the Endangered Species Act of 1973. It is also protected under the Florida Wildlife Code Chapter 39-27.

The American Alligator Farmers Association (P.O. Drawer 1208, Keystone Heights, Florida 32656) publishes a newsletter, *Gatortalk*.

Total production of wild and farmed alligator skins in the USA is summarized in the following table.

| | | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Louisiana | Farm | 3,000 | 2,500 | 27,500 | 60,668 | 24,848 |
| | Wild | 17,000 | 20,000 | 23,000 | 25,000 | 25,000 |
| Florida | Farm | 3,921 | 6,479 | 7,529 | 16,482 | 20,007 |
| | Wild | 4,000 | 4,653 | 7,444 | 8,000 | 7,525 |
| Georgia | Farm | 0 | 0 | 0 | 12 | 266 |
| | Wild | 0 | 0 | 0 | 0 | 0 |
| Texas | Farm | 0 | 0 | 0 | 20 | 348 |
| | Wild | 952 | 1,396 | 1,647 | 1,830 | 2,035 |
| S. Carolina | Wild | 0 | 0 | 361 | 272 | 247 |
| Total | Farm | 6,921 | 8,979 | 35,029 | 77,182 | 45,469 |
| | Wild | 21,952 | 26,049 | 32,452 | 35,102 | 34,807 |

Source of Information: David *in litt.*, 1991; Joanen, *in litt.*, 1991

### Florida

The Florida Game and Fresh Water Fish Commission have issued regulations governing the taking, possession and sale of alligators and their products. The taking of nuisance alligators, the collection of eggs and the operation of alligator farms are also governed by regulations and permits. All skins must be tagged, and meat packaged and sealed.

Farms have been required to record details of their stock since 1978, at which time there were only four. The number of farms has increased rapidly, reaching a total of 58 in 1990. The majority of stock is derived from captive-bred hatchlings, but these are supplemented by eggs collected from the wild. Some are collected and incubated by the farmers themselves but these are supplemented by eggs collected and incubated by the Commission. Summaries of the stock and production levels are given below.

| | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|
| No. of farms | 40 | 48 | 48 | 58 |
| Total stock | 54,974 | 75,175 | 93,135 | 115,010 |
| Captive breeding | 10,737 | 9,963 | 15,074 | 21,821 |
| Eggs collected | 4,403 | 8,226 | 14,169 | 15,893 |
| Hatchlings collected | 321 | 6,403 | 5,019 | 5,272 |
| Skins produced | 6,479 | 7,529 | 16,482 | 20,007 |

Source of Information: David, 1990 and *in litt.*, 1991

## BJG Gator Ranch

480 S. Busby Terrace, Inverness, 32651, Florida, USA

Manager: Busby
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 8011 | 870 | 34 | 46 | 2024 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | - | 493 | 801 |
| Eggs collected | A.mis | 1982 | - | - | 332 | - |
| Hatchlings collected | A.mis | 1987 | - | - | 443 | - |

Source of Information: Sims *in litt.*, 1991

## Babcock Florida Company

P.O. Box 66, Star Route A, Punta Gorda, 33982 Florida, USA

Manager: Bill Curry/Peter
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 619 | 4 | - | - | 1185 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | A.mis | - | 869 | 402 | 798 | 776 |
| Hatchlings collected | A.mis | - | 121 | - | - | - |
| Skins produced | A.mis | - | - | 100 | 601 | - |

Source of Information: Sims *in litt.*, 1991

## Beck

Route 2, Box 38, Moore Haven, 33471 Florida, USA

Manager: Wayne Beck
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 1654 | 693 | 40 | 110 | 2497 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | - | 405 | 1060 |
| Eggs collected | A.mis | - | - | 156 | 332 | 316 |
| Hatchlings collected | A.mis | - | - | - | 450 | - |
| Skins produced | A.mis | - | - | - | - | 590 |

Source of Information: Sims *in litt.*, 1991

## Billy Kempfer

6254 Kempfer Rd, Melbourne, 32904 Florida, USA

Manager: Billy Kempfer
Date of Census: 30/06/91

Source of Information: David *in litt.*,1991

## Bonny Farms

P.O. Box 313, Highway 621 East, Lake Placid, 33852 Florida, USA

Manager: Joe Tillman
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 3135 | 292 | 96 | 318 | 3841 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 2072 | 395 | 1504 | - |
| Eggs collected | A.mis | 1982 | 301 | 195 | 274 | - |
| Hatchlings collected | A.mis | 1987 | - | 350 | 281 | - |
| Skins produced | A.mis | - | 63 | 25 | 50 | - |

Source of Information: Sims *in litt.*, 1991

## Busch Gardens

3605 E. Bougainvillea, Tampa, 33612 Florida, USA

Manager: Ron Reynolds
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 22 | 6 | 11 | 26 | 259 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | 9 | 14 | 22 |
| Eggs collected | A.mis | 1982 | - | - | - | - |
| Hatchlings collected | A.mis | 1987 | - | - | - | - |
| Skins produced | A.mis | - | - | - | 4 | - |

Source of Information: David *in litt.*, 1991; Sims *in litt.*, 1991

## CST Gator Farm

P.O. Drawer 1208, State Rd 21B, Keystone Heights, 32656 Florida, USA

Manager: Don R. Morgan
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *A.mississippiensis* | 1493 | 2170 | 80 | 190 | 1675 | |
| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
| Captive breeding | A.mis | - | 9 | 260 | 201 | 460 |
| Eggs collected | A.mis | 1982 | 258 | 374 | 975 | 758 |
| Hatchlings collected | A.mis | 1987 | - | 52 | - | 300 |
| Skins produced | A.mis | - | 735 | 350 | 300 | - |

Source of Information: Sims *in litt.*, 1991

## Circle N Farms

P.O. Box 65, Bushnell, 33513 Florida, USA

Manager: Donald Nelson
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *A.mississippiensis* | 625 | 383 | 27 | 80 | 1678 | |
| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
| Captive breeding | A.mis | - | 121 | 249 | 530 | 345 |
| Eggs collected | A.mis | 1982 | 301 | 168 | 228 | 280 |
| Hatchlings collected | A.mis | 1987 | - | - | - | - |

Source of Information: Sims *in litt.*, 1991

## Clabrook Farms (formerly Gator jungle)

P.O. Box 209, 26205 E. Highway 50, Christmas, 32709 Florida, USA

Manager: Jacob Kagan
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 6492 | 5673 | 61 | 180 | 11489 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 493 | 67 | 90 | 174 |
| Eggs collected | A.mis | 1982 | 301 | 407 | 559 | 493 |
| Hatchlings collected | A.mis | 1987 | - | 52 | 180 | 71 |
| Skins produced | A.mis | - | 1314 | 1234 | 1979 | 3356 |

Source of Information: Sims *in litt.*, 1991

## Colson Gator Farm

13610 Ponce de Leon Blvd, Brooksville, 34601 Florida, USA

Manager: Flynn Colson
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | 4 | 2 | 3 | 204 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | A.mis | 1982 | - | - | - | - |
| Hatchlings collected | A.mis | 1987 | - | - | - | - |

Source of Information: Sims *in litt.*, 1991

## Coosemans (Ada Farm)

26500 S.W. 217th Ave., Homestead, 33030 Florida, USA

Manager: Danny Coosemans
Date of Census: 31/12/89

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | - | - | - | - |

Source of Information: Sims *in litt.*, 1991

## Crooked River Farm

P.O. Box 601, Carrabelle, 32322 Florida, USA

Manager: Tom Mitchell
Date of Establishment: 01/01/00
Date of Census: 31/12/89

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | - | 15 | 35 | 50 |

Source of Information: Sims *in litt.*, 1991

## Crutchfield's Reptile Enterprises

P.O. Box 1145, Bushnell, 33513 Florida, USA

Manager: Tommy E. Crutchfield
Date of Census: 31/12/89

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | - | 6 | 15 | 57 |

Source of Information: Sims *in litt.*, 1991

## Cypress Creek Farms

P.O. Box 1071, Starke, 32091 Florida, USA

Manager: Scott Anderson
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 442 | 150 | - | - | 1717 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | - | - | - |
| Eggs collected | A.mis | 1982 | - | 156 | 280 | - |
| Hatchlings collected | A.mis | 1987 | - | - | 66 | 116 |

Source of Information: Sims *in litt.*, 1991

## Drennan Crawford Lee

Route 2, Box 16, Wildwood, 32785 Florida, USA

Manager: Drennan Crawford Lee
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | - | - | - | 91 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | A.mis | - | - | 156 | - | - |
| Skins produced | A.mis | - | - | - | - | 25 |

Source of Information: Sims *in litt.*, 1991

## Dunnellon Alligator Farm

14376 S.W. Hwy. 484, Dunnellon, 32630 Florida, USA

Manager: James Archie Smith
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 661 | 746 | 6 | 15 | 1725 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | 5 | 36 | 84 |
| Eggs collected | A.mis | 1982 | 129 | 250 | 448 | - |
| Hatchlings collected | A.mis | 1987 | - | 360 | 84 | 171 |
| Skins produced | A.mis | - | - | - | 22 | 89 |

Source of Information: Sims *in litt.*, 1991

## Everglades Gator Farm (aka Tours Inc.)

P.O. Box 907, 40351 S.W. 192nd Ave., Homestead, 33090 Florida, USA

Manager: John Hudson
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 2117 | 1893 | 100 | 200 | 4461 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | 78 | 985 | 1054 |
| Eggs collected | A.mis | 1982 | 301 | 367 | 604 | - |
| Hatchlings collected | A.mis | 1987 | - | 600 | 490 | 609 |
| Skins produced | A.mis | - | 1 | 17 | 75 | 97 |

Source of Information: Sims *in litt.*, 1991

## Everglades Wonder Farm

P.O. Box 292, Bonita Springs, 33923 Florida, USA

Manager: David T. Piper, Jr
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 8 | 44 | 28 | 29 | 109 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | - | 5 | 8 |
| Eggs collected | A.mis | 1982 | - | - | - | - |
| Hatchlings collected | A.mis | 1987 | - | - | - | - |

Source of Information: Sims *in litt.*, 1991

## Exotic Breeders

7676 E. Shore Dr., Inverness, 32650 Florida, USA

Manager: Ron Nelson
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 670 | - | - | - | 1054 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 379 | 408 | - | - |
| Hatchlings collected | A.mis | - | - | - | - | 449 |

Source of Information: Sims *in litt.*, 1991

## Florida Cypress Gardens

P.O. Box 1, Cypress Gardens, 33884 Florida, USA

Manager: Andy Koukoulis
Date of Census: 30/06/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 20 | 55 | 3 | 2 | 61 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | A.mis | 1982 | - | - | - | - |
| Hatchlings collected | A.mis | 1987 | - | - | - | - |
| Skins produced | A.mis | - | 1 | - | - | - |

Source of Information: David *in litt.*, 1991

## Flying P Ranch

P.O. Box 892, Highway 471 North, Bushnell, 33513 Florida, USA

Manager: George O. Parrott
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 1822 | 1899 | 16 | 71 | 3566 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 27 | 25 | 1 | 98 |
| Eggs collected | A.mis | 1982 | 404 | 246 | 736 | - |
| Hatchlings collected | A.mis | 1987 | 200 | 280 | 383 | 259 |
| Skins produced | A.mis | - | 898 | 1429 | 4400 | 4821 |

Source of Information: Sims *in litt.*, 1991

## Foster Farms Inc.

33285 U.S. Hwy. 441 N., Okeechobee, 34972 Florida, USA

Manager: Kevin O'Neil Foster
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 6906 | 3589 | 208 | 542 | 12308 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 324 | 365 | 1325 | 4672 |
| Eggs collected | A.mis | 1982 | 903 | 1464 | 2955 | - |
| Hatchlings collected | A.mis | 1987 | - | 12 | 29 | 93 |
| Skins produced | A.mis | - | 56 | 10 | - | - |

Source of Information: Sims *in litt.*, 1991

## Franks Gator Farm

1066 Fisherman's Drive, Osteen, 32764 Florida, USA

Manager: Patricia H. Franks
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 560 | 193 | 10 | 39 | 802 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | - | 101 | 560 |
| Eggs collected | A.mis | 1982 | - | - | - | - |
| Hatchlings collected | A.mis | 1987 | - | - | - | - |

Source of Information: Sims *in litt.*, 1991

## Freer Robert

2495 North West 35th Avenue, Miami, 33142 Florida, USA

Manager: Robert W. Freer
Date of Census: 31/12/89

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | - | 2 | 10 | 262 |

Source of Information: Sims *in litt.*, 1991

## Froehlich's Gator Farm

26256 East Highway 50, Christmas, 32709 Florida, USA

Manager: Edwin Froehlich
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 1500 | 2425 | - | - | 3724 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | A.mis | 1982 | - | - | - | - |
| Hatchlings collected | A.mis | 1987 | - | - | - | - |
| Skins produced | A.mis | - | 1449 | 1716 | 3300 | 2888 |

Source of Information: Sims *in litt.*, 1991

## Gator Acres Inc.

210 N.E. 135th Terr., Gainesville, 32601 Florida, USA

Manager: Robert Lycan
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 3129 | 2996 | 28 | 97 | 5021 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 520 | 232 | 576 | 215 |
| Eggs collected | A.mis | 1982 | 301 | 697 | 611 | - |
| Hatchlings collected | A.mis | 1987 | - | 289 | 398 | 152 |
| Skins produced | A.mis | - | 130 | 622 | 1150 | 2400 |

Source of Information: Sims *in litt.*, 1991

## Gator Jaws Inc.

1525 Langly Avenue, Deland, 32724 Florida, USA

Manager: Jay G. Hilden
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 705 | 557 | 16 | 32 | 1310 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | 69 | 29 | 24 |
| Eggs collected | A.mis | 1982 | - | 375 | 561 | - |
| Hatchlings collected | A.mis | 1987 | - | - | 198 | 216 |
| Skins produced | A.mis | - | 1 | 130 | 151 | - |

Source of Information: Sims *in litt.*, 1991

## Gator Jungle of Plant City

5145 Harvey Tew Road, Plant City, 33565 Florida, USA

Manager: Tracy Howell
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 630 | 911 | 54 | 124 | 1969 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 42 | 24 | 127 | - |
| Eggs collected | A.mis | 1982 | 129 | 357 | 332 | - |
| Hatchlings collected | A.mis | 1987 | - | 254 | 351 | 245 |
| Skins produced | A.mis | - | 113 | 72 | 84 | 155 |

Source of Information: Sims *in litt.*, 1991

## Gatorama

P.O. Box 248 Palmdale, 33944 Florida, USA

Manager: David W. Thielen
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 1025 | 1064 | 80 | 227 | 2580 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 176 | 87 | 82 | 558 |
| Eggs collected | A.mis | 1982 | - | 267 | 333 | 228 |
| Hatchlings collected | A.mis | 1987 | - | 306 | 493 | 252 |
| Skins produced | A.mis | - | 7 | 90 | 600 | 604 |

Source of Information: Sims *in litt.*, 1991

## Gatorman

357 Orange St, Sebring, 33807 Florida, USA

Manager: Steve Kackley
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 375 | 304 | 33 | 76 | 1140 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 305 | - | 59 | 170 |
| Eggs collected | A.mis | - | - | - | 332 | 229 |
| Skins produced | A.mis | - | - | 12 | - | - |

Source of Information: Sims *in litt.*, 1991

## Geneva Farms

P.O. Box 1119, Geneva, 32732 Florida, USA

Manager: Roger Ruvell
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 297 | - | - | - | 795 |

Source of Information: Sims *in litt.*, 1991

## Gilley, Jerry

11605 Winn Rd, Riverview, 33569 Florida, USA

Manager: Jerry Gilley
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | - | - | - | - |

Source of Information: Sims *in litt.*, 1991

## Godwin's Gator land, Inc.

14501 S. Orange Blossom Tr., Orlando, 32821 Florida, USA

Manager: Frank Godwin
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 681 | 2176 | 215 | 261 | 3443 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 99 | 65 | 25 | 55 |
| Eggs collected | A.mis | 1982 | 301 | 534 | 270 | 729 |
| Hatchlings collected | A.mis | 1987 | - | 348 | 135 | 32 |
| Skins produced | A.mis | - | 859 | 1041 | 1122 | 1000 |

Source of Information: Sims *in litt.*, 1991

## Gomes Gator Farm

11605 Winn Rd, Riverview, 33569 Florida, USA

Manager: Mark A. Gomes
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | - | 4 | 6 | 10 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 10 | - | - | - |
| Eggs collected | A.mis | 1982 | - | - | - | - |
| Hatchlings collected | A.mis | 1987 | - | - | - | - |
| Skins produced | A.mis | - | 2 | 1 | 1 | 1 |

Source of Information: Sims *in litt.*, 1991

## Hilltop Farms

P.O. Box 818, 1107 West Main Street, Avon Park, 33825 Florida, USA

Manager: Lawler M. Wells
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 5070 | 5468 | 155 | 495 | 13691 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 3140 | 3378 | 5375 | 5070 |
| Eggs collected | A.mis | 1982 | - | 156 | - | - |
| Hatchlings collected | A.mis | 1987 | - | - | - | - |
| Skins produced | A.mis | - | 28 | 116 | 1314 | 243 |

Source of Information: Sims *in litt.*, 1991

## Howell Alligator Farm

6401 W. Knights Griffin Rd, Plant City, 33566 Florida, USA

Manager: John T. Howell
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 903 | 878 | 66 | 168 | 1531 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 69 | 130 | - | 137 |
| Eggs collected | A.mis | - | 129 | 374 | 686 | 777 |
| Hatchlings collected | A.mis | - | - | 46 | 38 | 22 |

Source of Information: Sims *in litt.*, 1991

## Huckabay

810 N. 7th St, Dade City, 33525 Florida, USA

Manager: J. Lee
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 46 | - | 1 | 3 | 50 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | - | - | 46 |

Source of Information: Sims *in litt.*, 1991

## Hunt's Alligator Breeding Ranch

Route 1, Box 25-H, Gator Farm Rd, Bushnell, 33513 Florida, USA

Manager: Clyde M. Hunt
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 1923 | 2640 | 97 | 196 | 3718 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 715 | 1052 | 1067 | 1225 |
| Eggs collected | A.mis | - | 129 | 336 | 495 | 333 |
| Hatchlings collected | A.mis | - | - | 284 | 399 | 385 |
| Skins produced | A.mis | - | 803 | 475 | 811 | 665 |

Source of Information: Sims *in litt.*, 1991

## J & M Game Farm

P.O. Box 84, Kirby Thompson Rd, Palmdale, 33944 Florida, USA

Manager: Maudine Posey
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | 165 | 70 | 74 | 161 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 221 | 75 | 41 | 127 |
| Eggs collected | A.mis | - | 172 | - | - | 424 |
| Skins produced | A.mis | - | 14 | 3 | - | 122 |

Source of Information: Sims *in litt.*, 1991

## J & M Gator Farm

P.O. Box 84, U.S. 27, Palmdale, 33944 Florida, USA

Manager: Maudine Posey
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 531 | 1044 | 21 | 45 | 2315 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 26 | - | - | - |
| Eggs collected | A.mis | - | 172 | 117 | 469 | - |
| Hatchlings collected | A.mis | - | - | 50 | - | - |
| Skins produced | A.mis | - | - | 19 | 75 | 160 |

Source of Information: Sims *in litt.*, 1991

## Limestone Farms, Inc.

202 Dairy Rd, Auburndale, 33823 Florida, USA

Manager: Lois A. Howell
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | 10 | 10 | 35 | . 52 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Skins produced | A.mis | - | 2 | - | - | - |

Source of Information: Sims *in litt.*, 1991

## Lowry Park Zoological Garden

7530 N. Boulevard, Tampa, 33604 Florida, USA

Date of Census: 30/06/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | 12 | 4 | 6 | 22 |

Source of Information: David *in litt.*, 1991

## Nunez Ranch

3201 Beckum Rd, Dade City, 33525 Florida, USA

Manager: Ernest Nunez
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | - | - | - | - |

Source of Information: Sims *in litt.*, 1991

## Parker Island Gator Farm

P.O. Box 313, Lake Placid, 33852 Florida, USA

Manager: William Tillman
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 317 | 4680 | - | - | 4510 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | A.mis | - | - | 156 | 275 | 317 |
| Hatchlings collected | A.mis | - | - | 185 | - | - |
| Skins produced | A.mis | - | - | - | 466 | 469 |

Source of Information: Sims *in litt.*, 1991

## Pella's Gator Farm 1

904 Lake Josephine Dr., Sebring, 33872 Florida, USA

Manager: Edward E. (Gene) and Dennis R. Pella
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 1619 | 1972 | 257 | 754 | 3321 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | 204 | - | 507 |
| Eggs collected | A.mis | - | - | - | - | 535 |
| Skins produced | A.mis | - | - | - | - | 243 |

Source of Information: Sims *in litt.*, 1991

## Pella's Gator Farm 2

904 Lake Josephine Dr., Sebring, 33872 Florida, USA

Manager: Edward E. (Gene) and Dennis R. Pella
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 1125 | 427 | 191 | 414 | 2061 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | - | 309 | - |
| Eggs collected | A.mis | - | - | 339 | 604 | - |
| Hatchlings collected | A.mis | - | - | 650 | 441 | - |
| Skins produced | A.mis | - | - | - | - | 65 |

Source of Information: Sims *in litt.*, 1991

## Rayfield Groves

165 Gator Rd, Merritt Island, 32952 Florida, USA

Manager: Jack Rayfield
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 306 | 342 | 10 | 32 | 132 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 184 | 148 | 267 | 306 |
| Hatchlings collected | A.mis | - | - | - | - | 300 |
| Skins produced | A.mis | - | - | - | - | 2 |

Source of Information: Sims *in litt.*, 1991

## Rewis & Nila

P.O. Box 585 Eaton Park, 33870 Florida, USA

Manager: J.C. Rewis and Nila
Date of Census: 30/06/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | - | 4 | 10 | 14 |

Source of Information: David *in litt.*, 1991

## Russel Grow Out

P.O. Box 4306, Sanford, 32771 Florida, USA

Manager: Jeffrey T. Russell
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | - | - | - | 296 |

Source of Information: Sims *in litt.*, 1991

## Russell Gator Farm

P.O. Box 536, Osteen, 32764 Florida, USA

Manager: Tommy and Jackie
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 1662 | 2010 | 43 | 130 | 2795 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 671 | 944 | 736 | 1164 |
| Eggs collected | A.mis | - | 172 | 374 | 333 | 227 |
| Skins produced | A.mis | - | - | - | 391 | 1097 |

Source of Information: Sims *in litt.*, 1991

## Speer's Alligator Farm

6150 Hwy. 46 Mims, 32754 Florida, USA

Manager: David R. Speer
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 374 | - | 16 | 34 | 424 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | - | - | 374 |

Source of Information: Sims *in litt.*, 1991; David *in litt.*, 1991

## St Augustine Alligator Farm

P.O. Drawer E, St Augustine, 32084 Florida, USA

Manager: Mark Wise
Date of Census: 9/10/91

The farm keeps 20 of the 22 living species of crocodile and has successfully bred 13 of them (Wise, 1990).

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | 2 | 227 | 109 | 350 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 2 | - | - | - |
| Eggs collected | A.mis | - | - | - | 9 | - |
| Hatchlings collected | A.mis | - | - | - | - | 26 |
| Skins produced | A.mis | - | - | - | - | 1 |

Source of Information: Sims *in litt.*, 1991;

## St Augustine Alligator Farm

1155 N.E. 77th St, Ocala, 32670 Florida, USA

Manager: David C. Drysdale
Date of Census: 9/10/91

This farm was reported to be closed and the stock transferred to other institutions.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 492 | 1732 | 65 | 141 | 2430 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 424 | 612 | - | 294 |
| Hatchlings collected | A.mis | - | 198 | - | - | - |

Source of Information: Sims *in litt.*, 1991; Wise, 1991

## Suggs, George

5194 North City 10th Ave., Greenacres City, 336633 Florida, USA

Manager: George Suggs
Date of Census: 9/10/91

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | - | - | - | - |

Source of Information: Sims *in litt.*, 1991

## Swampy Acres Gator Farm

122 Karola Drive, Sebring, 33870 Florida, USA

Manager: Ken Geiger
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 865 | 1723 | 85 | 170 | 2580 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | 671 | 1072 | 472 | 699 |
| Eggs collected | A.mis | - | - | 375 | 332 | 228 |
| Hatchlings collected | A.mis | - | - | 15 | - | - |
| Skins produced | A.mis | - | 3 | 67 | 85 | 482 |

Source of Information: Sims *in litt.*, 1991

## Walliser, Edwin

11041 Walliser Road, Lithia Rd, 33547 Florida, USA

Manager: Edwin Walliser
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | - | - | - | - |

Source of Information: Sims *in litt.*, 1991

## Wooten's Everglades Airboat Tours

Star Route Box 121, Ochopee, 33943 Florida, USA

Manager: Raymond Wooten
Date of Census: 9/10/91

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 68 | 18 | 96 | 95 | 2580 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | - | 25 | 68 |

Source of Information: Sims *in litt.*, 1991

## Georgia

Georgia has implemented a nuisance alligator programme similar to the one in Florida.

### Blackwater Alligator Farm

Route 1, Box 39-A, Nahunta, 31553 Georgia, USA

Manager: John and Carol Southard
Date of Establishment: 01/01/88
Date of Census: 31/12/90
Food: Chicken and fish

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | - | 3 | 8 | 11 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Skins produced | A.mis | - | - | - | - | 172 |

Source of Information: Swiderek *in litt.*, 1991

### Georgia Gators Unlimited

Rt.2 Box 193, Dawson, 31742 Georgia, USA

Manager: Al Redmond
Date of Establishment: 01/01/88
Date of Census: 31/12/90
Total Area: 2 acres (0.81ha), (1 breeding pond, 1 rearing pond)
Food: Frozen fish bought commercially

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 19 | 5 | 4 | 13 | 41 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | 1989 | - | - | 19 | 19 |
| Eggs collected | A.mis | - | - | - | - | 78 |

Source of Information: Questionnaire; Ruckel *in litt.*, 1990; Swiderek *in litt.*, 1991

## Low Country Gators

54 Holtz Road, Brunswick, 31525 Georgia, USA

Manager: R.L. Holtzendorf, Sr
Date of Establishment: 14/08/87
Date of Census: 31/12/90
Total Area: 11 acres (4.45ha), (3 breeding ponds, 3 rearing ponds)
Food: Fish from local sources, red meat from Alabama and commercial feed from Burris

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 56 | 79 | 8 | 38 | 181 |
| *C.moreletii* | - | 7 | - | - | - |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | 1988 | - | 34 | 55 | 56 |
| Eggs collected | A.mis | - | - | 80 | 306 | 201 |

Source of Information: Questionnaire; Ruckel *in litt.*, 1990; Swiderek *in litt.*, 1991

## Prehistoric Ponds, Inc

Rt.3, Box 28, 31634, Homerville, Georgia, USA

Manager: David Evans

Most hatchlings are bought from out of state.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | 5041 | 1696 | 24 | 76 | 6837 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | - | - | 105 |
| Eggs collected | A.mis | 1982 | - | 210 | - | 483 |
| Hatchlings collected | A.mis | 1987 | - | - | - | - |

Source of Information: Ruckel *in litt.*, 1990; Swiderek *in litt.*, 1991

## Strickland Alligator Farm

Rt.1 Box 542, Reidsville, 30453 Georgia, USA

Manager: Lannie Strickland
Date of Establishment: 01/08/89
Date of Census: 31/12/90
Total Area: (not completed, 17 rearing ponds)
Food: Fish, chicken, beef and pellets from farms, ponds and supplier

| | Stock on Farm Hatch | Inms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | 109 | - | - | 109 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Skins produced | A.mis | - | - | - | - | 18 |

Source of Information: Questionnaire; Ruckel *in litt.*, 1990; Swiderek *in litt.*, 1991

## Turners Gator Farm

Rt.2 Box 414, Cairo, 31728 Georgia, USA

Manager: Betty J. Turner
Date of Establishment: 01/11/85
Date of Census: 31/12/90
Total Area: (4 breeding ponds, 9 rearing ponds)
Food: Chicken, beef from farms and gator supplements from Louisiana

| | Stock on Farm Hatch | Inms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 290 | 352 | 6 | 13 | 661 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | 1986 | 84 | 90 | 178 | 290 |
| Eggs collected | A.mis | - | - | - | - | 303 |
| Skins produced | A.mis | 1989 | - | - | 12 | 76 |

Source of Information: Questionnaire; Ruckel *in litt.*, 1990; Swiderek *in litt.*, 1991

## Wright

P.O. Box 150, Axson, 31624 Georgia, USA

Manager: Winston Wright
Date of Establishment: 01/03/84
Date of Census: 31/12/90
Total Area: (1 breeding pond, 2 rearing ponds)
Food: Chicken from local farm

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 191 | 356 | 2 | 6 | 555 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | 1984 | 86 | 159 | 89 | 191 |
| Eggs collected | A.mis | - | - | - | - | 200 |

Source of Information: Questionnaire; Ruckel *in litt.*, 1990; Swiderek *in litt.*, 1991

### Louisiana

The Louisiana Department of Wildlife and Fisheries issues a comprehensive set of regulations governing the taking of alligators and the operation of farms. Permits are required for the taking or possession of alligators and the collection of eggs, and all farms must be licensed and comply with certain regulations. The movement of live alligators and eggs in an out of the State is strictly controlled. The selling of hides and meat may only be carried out under licence and all hide must be tagged with tags obtained from the Department. Where a farmer has permission to collect eggs from the wild he is required to release a certain percentage of young alligators (48" (1.22m) in length) as determined by the Department. The farmers are required to achieve a minimum hatching success rate.

The number of alligator farms in Louisiana has been increasing rapidly in recent years under the control of the Louisiana Department of Wildlife and Fisheries. Initially, the farms were supplied with hatchlings from eggs incubated at the Rockefeller Wildlife Refuge and collected from State-owned land. However, demand outstripped supply, and farmers were allowed to collect eggs from private land for the first time in 1986.

A small number of hatchlings are also collected and several farms have developed captive-breeding facilities. Stock and production statistics are summarized below.

| | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|
| No. of farms | 31 | 54 | 92 | 123 |
| Total stock | 29,000 | 84,000 | 223,000 | 360,863 |
| Captive breeding | ? | 3,000 | ? | 7,607 |
| Eggs collected | ? | 69,241 | 182,671 | 297,394 |
| Hatchlings collected | ? | 1,253 | 1,351 | ? |
| Skins produced | 2,500 | 27,500 | 60,668 | 24,848 |

Source of Information: Joanen *in litt.*, 1991; Joanen and McNease, 1990; Joanen *et al.*, 1990

The addresses of the farms registered in 1990 are listed below:

**A & A Gator Farm Inc.** P.O. Box 373, Springfield, 70462 Louisiana, USA
Manager: Jacob and David Abel

**A & B Henderson Alligator** P.O. Box 51564, Lafayette, 70505 Louisiana, USA
Manager: Aubrey Henderson

**A G Farms** Rt.1 Box 1250, Pelican, 71063 Louisiana, USA
Manager: Glenn Arnold

**AAA Gators** 8378 Robert St, Sorrento, 70778 Louisiana, USA
Manager: Edwin Pezant, Sr

**Acadiana Alligators Inc.** Rt.4, Box 90, Opelousas, 70570 Louisiana, USA
Manager: John Stansbury

**Alagri Inc** 9631 Cane Market Rd, Denham Springs, 70726 Louisiana, USA
Manager: Charles Shilling

**Alligator Farms Inc.** P.O. Box 44064, Shreveport, 71134 Louisiana, USA
Manager: Raymond O'Brien

**B & R Farms** P.O. Box 671, Abbeville, 70510 Louisiana, USA
Manager: Bernell Koch

**Barron, Travis** Rt.1 Box 196B, Washington, 70589 Louisiana, USA
Manager: Travis Barron

**Bartmess** Rt.1 Box 487-A, Winnsboro, 71295 Louisiana, USA
Manager: George Bartmess

**Bayou Pierre Gator Farm** Rt.1 Box 1155, Natchitoches, 71457 Louisiana, USA
Manager: Alice A. Hart

**Beaubouef**
HC 70, Box 28, Acme, 71316 Louisiana, USA
Manager: Dwana Beaubouef

**Blahut**
24980 Fayard Rd, Holden, 70744 Louisiana, USA
Manager: Julius C. Blahut

**Bogator Inc.**
506 Comanche Tr., West Munroe, 71291 Louisiana, USA
Manager: Sheree Craft

**Boothe's Alligator**
P.O. Box 42, Harrisonburg, 71340 Louisiana, USA
Manager: Kenneth M. Boothe

**Bounds**
Rt.1 Box 105, Coushatta, 71019 Louisiana, USA
Manager: Danny Ray Bounds

**Bull Run Enterprises**
1715 Savanne Road, Houma, 70364 Louisiana, USA
Manager: Thomas E. Fairley

**CAG Farms**
4079 Bayou Black Drive, Houma, 70360 Louisiana, USA
Manager: Cox, Gill, Antill

**Cajun Alligator Farm**
PI Route 20, Kaplan, 70548 Louisiana, USA
Manager: Shaine Stelly

**Camma Farms**
P.O. Box 298, St Amant, 70774 Louisiana, USA
Manager: Myer Bishop

**Capers, Marty**
Rt.2 Box 300, Oak Grove, 71263 Louisiana, USA
Manager: Marty E. Capers

**Capers, Randy**
Rt.2 Box 291, Hwy. 585, Oak Grove, 71263 Louisiana, USA
Manager: Randy Capers

**Chefal Inc.**
Rt.5 Box 281-K, New Orleans, 70129 Louisiana, USA
Manager: John G. Fabacher

**Clulee**
P.O. Box 410, Hahnville, 70057 Louisiana, USA
Manager: Neal Clulee

**Coats**
P.O. Box 584, Springfield, 70462 Louisiana, USA
Manager: Leonard Coats, Jr

**Cocodrie Farms**
No.9034 S. Vignes, Baton Rouge, 70817 Louisiana, USA
Manager: D.R. Keller

**Cooper**
HC69 Box 66, Jonesville, 71343 Louisiana, USA
Manager: Ellis Glen Cooper

**Credeur**
Rt.1 Box 514, Scott, 70583 Louisiana, USA
Manager: Paul I. Creuder

**D & G Co.**
Rt.3 Box 209-A, Jonesville, 71343 Louisiana, USA
Manager: Sidney Davies

**Davco Farms Inc.**
27705 Mary Kitchen Road, Albany, 70711 Louisiana, USA
Manager: Margaret David

**Daves**
P.O. Box 442, St Joseph, 71366 Louisiana, USA
Manager: John W. Daves

**Dear Gator Farms**
Rt.1 Box 842, Rayville, 71269 Louisiana, USA
Manager: J.D. Dear

**Delesdernier**
P.O. Box 38, Bootheville, 70038 Louisiana, USA
Manager: Donald Delesdernier

**Deroche**
St Rt Box 86, Des Allemands, 70030 Louisiana, USA
Manager: Darly A. Deroche

**Donald Farms**
907 Cheniere Drew Rd, West Munroe, 71291 Louisiana, USA
Manager: J. Donald/D. Traxler

**Ducote**
Rt.1 Box 50, Bunkie, 71322 Louisiana, USA
Manager: John D Ducote

**Dufrene**
P.O. Box 1529, Paradis, 70080 Louisiana, USA
Manager: Clinton Dufrene

**Ebel Corporation**
Rt.1 Box 519, DeRidder, 70634 Louisiana, USA
Manager: Karl and Chris Ebel

**Edwards**
P.O. Box 456, Farmerville, 71241 Louisiana, USA
Manager: Stanley W. Edwards

**Emfinger**
P.O. Box 698, Gilbert, 71336 Louisiana, USA
Manager: Bobby R. Emfinger

**Fannaly**
405 South 8th Street, Ponchatoula, 70454 Louisiana, USA
Manager: Michael H. Fannaly

**Ferrington, Florence**
Rt.1 Box 1350, Wisner, 71378 Louisiana, USA
Manager: Florence Ferrington

**Ferrington, Robert C.**
Rt.1 Box 1500, Wisner, 71378 Louisiana, USA
Manager: Robert C. Ferrington

**Ferrington, Robert M.**
P.O. Box 433, Wisner, 71378 Louisiana, USA
Manager: Robert M. Ferrington

**Fitzmorris**
78070 Koogie Rd, Covington, 70433 Louisiana, USA
Manager: James R. Fitzmorris

**Fletcher**
P.O. Box 156, Mathews, 70375 Louisiana, USA
Manager: Thomas J. Fletcher IV

**Fuller Farms**
P.O. Box 245, Dubach, 71235 Louisiana, USA
Manager: Charles M. Fuller

**G & R Gator Farm**
2803 East Park Ave., Houma, 70363 Louisiana, USA
Manager: Glynn A. Trahan

**GMM Farm**
Rt.3 Box 1500, Abbeyville, 70510 Louisiana, USA
Manager: Gary M. Mayard

**Gators Unlimited Inc.**
Rt.5 Box 1967, Abbeville, 70510 Louisiana, USA
Manager: Stephen W. Sagrera

**General Delivery**
P.O. Box 95, Springfield, 70462 Louisiana, USA
Manager: Leonard K. Coats

**Genesis I**
Rt.2 Box 28, Kentwood, 70444 Louisiana, USA
Manager: Isaac H. Saltz

**Grand Chenier Alligator Farm**
Rt.1 Box 60-B, Grand Chenier, 70643 Louisiana, USA
Manager: S. Stelly/M. Fonseca

**Greenwood Gator Farm**
Rt.1 Box 5006, Gibson, 70356 Louisiana, USA
Manager: Richard Domangue

**Guidry Alligator Farm**
230 East 53rd St, Cut Off, 70345 Louisiana, USA
Manager: Kim Guidry

**Guste Gators**
500 Guste Island Road, Madisonville, 70447 Louisiana, USA
Manager: Robert P. Guste

**Harris**
520 wy. 124 N, Jonesville, 71343 Louisiana, USA
Manager: O.J. Harris

**Hebert's Aqua Farm**
117 Reams Boulevard, St Martinville, 70582 Louisiana, USA
Manager: Timothy P. Herbert

**Hebert, Herman**
Rt.2 Box 3440, Plaquemine, 70764 Louisiana, USA
Manager: Herman Herbert

**Herring**
Rt.4 Box 20, Winnsboro, 71295 Louisiana, USA
Manager: Bryan O. Herring

**Hilburn**
Rt.1 Box 127-A, Gilbert, 71336 Louisiana, USA
Manager: Lionel B. Hilburn Sr

**Holland Alligator Farm**
HC69 Box 25A, Jonesville, 71343 Louisiana, USA
Manager: Tracy E. Holland

**J & J Gator Farm**
372 Canal Road, Napoleonville, 70390 Louisiana, USA
Manager: Jason M. Cox

**Jones**
HC74 Box 194, Hebert, 71436 Louisiana, USA
Manager: Billy Ray Jones

**Klein & Associates**
5551 Corporate Blvd, Suite 3-G, Baton Rouge, 70808 Louisiana, USA
Manager: Egon Klein

**Kliebert, Harvey**
1264 W. Yellow Water Rd, Hammond, 70403 Louisiana, USA
Manager: Harvey Kliebert

**Kliebert, Robert**
No.703 Thompson Drive, Hammond, 70401 Louisiana, USA
Manager: Robert Kliebert

**Kopenhafer**
Rt.6 Box 868, Abbeville, 70510 Louisiana, USA
Manager: Gerry J. Kopenhafer

**L & B Alligator Farm**
3907 Hwy 1, Napoleonville, 70390 Louisiana, USA
Manager: Lance Bernuchaux

**L & D Gator Farm**
HC 70, Box 28, Acme, 71326 Louisiana, USA
Manager: Lyle C. Beaubouef

**Latapie**
2811 Jackson Blvd., Chalmette, 70043 Louisiana, USA
Manager: Ralph R. Latapie

**Le Gators**
1308 Bull Run Rd, Schriever, 70395 Louisiana, USA
Manager: Lyle LeBlanc

**Ledet**
4091 Bayou Black Dr., Houma, 70360 Louisiana, USA
Manager: Dane P. Ledet

**Lege Gator Farm II**
Rt.5 Box 85, Abbeyville, 70510 Louisiana, USA
Manager: Chad Lege

**Lege, A.**
Rt.5 Box 84, Abbeyville, 70510 Louisiana, USA
Manager: Arnold J. Lege

**Lemaire**
107 Bea's Dr., Kaplan, 70548 Louisiana, USA
Manager: Floyd J. Lemaire

**Little Rivers Gators Inc**
29869 Hwy 442, Independence, 70443 Louisiana, USA
Manager: Joe Slade

**Lorio**
4008 Ithaca St, Metairie, 70002 Louisiana, USA
Manager: Jules A. Lorio III

**Louisiana Alligator Industries Inc.**
Rt.3 Box 66, Ville Platte, 70586 Louisiana, USA
Manager: Steele B. McAndrews

**Louisiana Land Exploration**
P.O. Box 7097, Houma, 70361 Louisiana, USA
Manager: Kermit Coulson Jr

**McCrory**
465 McCrory Lane, Ponchatoula, 70454 Louisiana, USA
Manager: Alonzo W. McCrory Sr

**McKoin**
RFD 1, Jones, 71250 Louisiana, USA
Manager: Marvin McKoin

**Montoucet**
123 Credeur Rd., Scott, 70583 Louisiana, USA
Manager: Jack Montoucet

**Palmisano**
P.O. Box 323, Belle Chasse, 70037 Louisiana, USA
Manager: Calvin Palmisano

**Plaquemines Alligator Farms Inc.**
7501 Zimpel Street, New Orleans, 70118 Louisiana, USA
Manager: Zachary Casey

**Prestenbach**
1512 Bayou Blue Road, Houma, 70364-3629 Louisiana, USA
Manager: L.J. Prestenbach

**Price**
1100 Tulane Avenue, Suite 326, New Orleans, 70112 Louisiana, USA
Manager: John V. Price

**Pritchard, David G.**
11119 Stringer Bridge Road, St Amant, 70774 Louisiana, USA
Manager: David G. Pritchard

**Pritchard, William G.**
#4 Sparrow Lane, River Ridge, 70123 Louisiana, USA
Manager: William G. Pritchard

**River Farms**
P.O. Box 450, Harrisonburg, 71340 Louisiana, USA
Manager: Everett Mayo

**Ryan**
146 Poole Bend Road, Jonesville, 71343 Louisiana, USA
Manager: William J. Ryan

**Sagrera & Broussard**
Rt.6 Box 318, Abbeyville, 70510 Louisiana, USA
Manager: Rodney C. Sagrera

**Sagrera, Kevin**
Rt.5 Box 112, Abbeyville, 70510 Louisiana, USA
Manager: Kevin Sagrera

**Sauros Incorporated**
Rt.3 Box 301, Welsh, 70591 Louisiana, USA
Manager: Robert E. Perkins

**Savoie**
318 St Anthony, Luling, 70070 Louisiana, USA
Manager: Gerald P. Savoie Sr

**Schmills Gator Farm**
104 Ellington Ave., Luling, 70070 Louisiana, USA
Manager: Kenny Schmill

**Simms**
P.O. Box 358, Wisner, 71378 Louisiana, USA
Manager: Dale Simms

**Simpson**
Rt.1 Box 84-F, Downsville, 71234 Louisiana, USA
Manager: Bobby L. Simpson

**Sistrunk**
Rt.4 Box 109-A, Oak Grove, 71263 Louisiana, USA
Manager: David Sistrunk

**Skains** P.O. Box 81, Farmerville, 71241 Louisiana, USA
Manager: Taylor Skains

**Smith** 270 Smith Bros. Rd, West Munroe, 71292 Louisiana, USA
Manager: Douglas D. Smith

**Stelly** PI Rt. Box 20, Kaplan, 70548 Louisiana, USA
Manager: Raywood J. Stelly

**Stelly, John** Rt.1 Box 60-B, Grand Chenier, 70643 Louisiana, USA
Manager: John Stelly

**Stelly, Stephen B.** Rt.1 Box 60, Grand Chenier, 70643 Louisiana, USA
Manager: Stephen B. Stelly

**Sturgis & Ola** P.O. Box 302, Clayton, 71326 Louisiana, USA
Manager: David C. Ola

**T-Bois Aquaculture** 530 Hamilton St, Lockport, 70374 Louisiana, USA
Manager: Ted Falgout

**Taylor Enterprises** Rt.2 Box 181-C-1, Bernice, 71222 Louisiana, USA
Manager: David Taylor

**Taylor, Curtis** Rt.1 Box 371, Sibley, 71073 Louisiana, USA
Manager: Curtis Taylor

**Terrebonne Alligator Farms** Rt.3 Box 989, Cut Off, 70345 Louisiana, USA
Manager: Lionel Terrebonne

**Thomas Co.** 408 Beasley St, Munroe, 71203 Louisiana, USA
Manager: George R. Thomas

**Torres** 101 Torres Rd, Thibodaux, 70301 Louisiana, USA
Manager: Roland J. Torres

**Tranquil Oakes Farm** Rt.4 Box 437, Covington, 70433 Louisiana, USA
Manager: William K. McWilliams

**Tri Gator Hatcheries** 410 Oak Lane, Luling, 70070 Louisiana, USA
Manager: M. Dempster

**Trinity Farms** 403 Hogan St, Berwick, 70342 Louisiana, USA
Manager: Mickey LeBlanc

| | |
|---|---|
| **Tucker** | 11487 Blackwater Rd, Baker, 70714 Louisiana, USA<br>Manager: George R. Tucker |
| **Valure, Anthony** | Rt.2 Box 200, Mansfield, 71052 Louisiana, USA<br>Manager: Anthony Valure |
| **Valure, Hugh P.** | 1315 Katherine Street, Houma, 70363 Louisiana, USA<br>Manager: Hugh P. Valure |
| **Vermilion Alligator Farms** | Rt.5 Box 112, Abbeyville, 70510 Louisiana, USA<br>Manager: Wayne J. Sagrera |
| **Wall** | 26900 Hwy 1037, Springfield, 70462 Louisiana, USA<br>Manager: Allen L. Wall |
| **Weaks, Carroll W** | P.O. Box 160, Wisner, 71378 Louisiana, USA<br>Manager: Carroll W. Weaks |
| **Weaver, Roger Dale** | Rt.2 Box 24550, Benton, 71006 Louisiana, USA<br>Manager: Roger Dale Weaver |
| **Welch's Alligator Farm** | Rt.1 Box 119, Grand Chenier, 70643 Louisiana, USA<br>Manager: Benny Welch |
| **West Pass Inc.** | Rt.2 Box 352-A, Lake Charles, 70605 Louisiana, USA<br>Manager: Jerry G. Jones |
| **Williams Inc.** | P.O. Box 428, Patterson, 70392 Louisiana, USA<br>Manager: Rudy C. Sparks |

## Texas

The Texas Parks and Wildlife Department issued permits for the collection of alligator eggs for the first time in 1990. A total of 206 nests were collected (approximately 24% of the nests on the properties concerned), yielding 7510 eggs (Brownlee, 1991).

### 4H Farms

Rt.1, Box 123A, Jouquin, TX 75954 Texas, USA

Manager: Thomas H. Harvey

First permitted 1989-90

Source of Information: Brownlee *in litt.*,1990

## Alligator Island

Rt.8, Box 900, Beaumont, TX 77705 Texas, USA

Manager: T.P. Hoffpauir Jr

First permitted 1988-89. Total stock: 206 *A. mississippiensis*

Source of Information: Brownlee *in litt.*, 1990

## Bayou Wildlife Park

P.O. Box 808, Rt.6, Alvin, TX 77511 Texas, USA

Manager: Clint Wolston
Date of Establishment: 01/01/89
Date of Census: 01/03/90
Total Area: 86 acres (34.80ha), (1 breeding pond, 1 rearing pond)
Food: Fish, meat and chicken from shrimp boats and stores

First permitted 1989-90

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | - | 5 | 6 | 11 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | 1990 | - | - | - | - |

Source of Information: Questionnaire; Brownlee *in litt.*, 1990

## Boggy Creek Gator Farm

Rt.1, P.O. Box 204, Mineola, TX 75773 Texas, USA

Manager: Vernon Phillips
Date of Establishment: 27/05/87
Date of Census: 01/09/90
Total Area: 20 acres (8.09ha), (7 breeding ponds, 1 rearing pond)
Food: Chicken, beef, horse and commercial; chicken farms, Burris Feeds LA, abattoirs

First permitted 1987-88

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | - | 39 | 1 | 4 | 44 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | A.mis | - | - | 39 | - | - |

Source of Information: Questionnaire; Brownlee *in litt.*, 1990

## Campbell's Alligator Farm

15910 Marek Lane, Gosby, TX 72532 Texas, USA

Manager: Robert L. Campbell Sr
Date of Establishment: 06/01/90
Date of Census: 31/12/89
Total Area: (32 rearing ponds)
Food: Barris dry feed - 56% from Barris Mill & Feed, Franklinton, LA

First permitted 1989-90

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 3511 | - | - | - | 3511 |

Source of Information: Questionnaire; Brownlee *in litt.*, 1990

## Catfish Corner

P.O. Box 851383, Mesquite, TX 75185-1383 Texas, USA

Manager: Billy M. Benson

First permitted 1988-89. Total stock: 109 *A. mississippiensis*.

Source of Information: Brownlee *in litt.*, 1990

## Clark's

4815 Sheri Lane, Crosby, TX 77532 Texas, USA

Manager: Robert B. Clark

First permitted 1988-89. Total stock 5 *A. mississippiensis*

Source of Information: Brownlee *in litt.*, 1990

## Dacus

P.O. Box 1988, Jacksonville, TX 75766 Texas, USA

Manager: Rex Dacus

First permitted 1986-87. Total stock: 13 *A.mississippiensis*

Source of Information: Brownlee *in litt.*, 1990

## Desert Dragon Ranch

P.O. Box 147, Terlingua, 79852 Texas, USA

Manager: Warren Lynch
Date of Establishment: 01/12/89
Date of Census: 31/12/89
Total Area: (1 rearing pond)
Food: Chicken from supermarket throw away

First permitted 1985-86

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | 10 | - | - | 10 |

Source of Information: Questionnaire; Brownlee *in litt.*, 1990

## Dutton

5605 FM 565 S, Baytown, TX 77520 Texas, USA

Manager: E.A. Dutton

First permitted 1989-90. Total stock: 55 *A.mississippiensis*

Source of Information: Brownlee *in litt.*, 1990

## Guns and Gators

P.O. Box 670, Spring Branch, TX 78070 Texas, USA

Manager: Marc des Parois

First permitted 1985-86. Total stock: 12 *A.mississippiensis*

Source of Information: Brownlee *in litt.*, 1990

## Hitchcock

Drawer 471, Coleman, TX 76834 Texas, USA

Manager: Grant Hitchcock

First permitted 1989-90

Source of Information: Brownlee *in litt.*, 1990

## Holloway

Rt.1, Box 4080, Nacogdoches, TX 75961 Texas, USA

Manager: Robert Holloway

First permitted 1985-86. Total stock on farm: 94 *A. mississippiensis*

Source of Information: Brownlee *in litt.*, 1990

## International Animal Exchange & Wildlife

601 Wildlife Parkway, Grand Prairie, TX 75050 Texas, USA

Manager: Ray Sutton

First permitted 1989-90

Source of Information: Brownlee *in litt.*, 1990

## LTS Farms

Rt.1 Box 367, Wharton, Texas, USA

Manager: Steve Janke
Date of Establishment: 01/11/88
Date of Census: 31/12/89
Total Area: 2.5 acres (1.01ha)
Food: Red meat and dry food from packing house and various locations

First permitted 1988-89

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *A.mississippiensis* | - | - | - | - | - |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Skins produced | A.mis | 1990 | - | - | - | 100 |

Source of Information: Questionnaire; Brownlee *in litt.*, 1990

## La Belle Hatchery

2220 Thomas Rd, Beaumont, TX 77706 Texas, USA

Manager: James C. Broussard
Date of Establishment: 01/01/87
Date of Census: 31/12/89
Food: Nutria

First permitted 1988-89

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *A.mississippiensis* | 2000 | - | - | - | 2000 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | A.mis | 1987 | 2536 | - | 6000 | - |

Source of Information: Questionnaire; Brownlee *in litt.*, 1990

## Leger

Rt.2, Box F75C, Beaumont, TX 77705 Texas, USA

Manager: Roy A. Leger

First permitted 1988-89. Total stock on farm: 15 *A. mississippiensis.*

Source of Information: Brownlee *in litt.*, 1990

## Perry

P.O. Box 176, Sweeny, TX 77480 Texas, USA

Manager: William J. Perry

First permitted 1988-89. Total stock on farm: 2 *A. mississippiensis.*

Source of Information: Brownlee *in litt.*, 1990

## Rotag Farms

P.O. Box 166, Sealy, TX 77474 Texas, USA

Manager: Sam Bond Jr and R.J. Grant

First permitted 1988-89. Total stock on farm: 15 *A. mississippiensis.*

Source of Information: Brownlee *in litt.*, 1990

## Roy

P.O. Box 220, Mauriceville, TX 77626 Texas, USA

Manager: Amous A. Roy

First permitted 1986-87. Total stock on farm: 139 *A. mississippiensis.*

Source of Information: Brownlee *in litt.*, 1990

## Sea Arama

9100 Seawall, Galveston, TX 77550 Texas, USA

Manager: J. Russell O'Connor

First permitted 1989-90. Total stock on farm: 11 *A. mississippiensis.*

Source of Information: Brownlee *in litt.*, 1990

## Star Farm

Rt.3, Box 3275, Nacogdoches, TX 75961 Texas, USA

Manager: Rick West

First permitted 1988-89. Total stock on farm: 1 *A. mississippiensis*

Source of Information: Brownlee *in litt.*, 1990

## Stelley Brothers Farm

Rt.2, Box 1009, Beaumont, TX 77705 Texas, USA

Manager: Marc Stelley

First permitted 1988-89. Total stock on farm: 468 *A. mississippiensis*

Source of Information: Brownlee *in litt.*, 1990

## Tatsch

156 Deepwoods Dr., Seguin, TX 78155 Texas, USA

Manager: Werner Tatsch

First permitted 1986-87. Total stock on farm: 2 *A. mississippiensis*.

Source of Information: Brownlee *in litt.*, 1990

## White

975 Bingman, Beaumont, TX 77705 Texas, USA

Manager: Mitchell J. White

First permitted 1986-87

Source of Information: Brownlee *in litt.*, 1990

**Species present:** *Crocodylus porosus*

Vanuatu became a Party to CITES on 15 October 1989.

There appears to be no legislative protection.

The International Trade (Fauna and Flora) Act, 1989, provides for the implementation of CITES; however, it will not enter into force until it has been gazetted and regulations have been made.

There are believed to be no commercial crocodile farms in Vanuatu.

Species present: *Caiman crocodilus*
*Crocodylus acutus*
*Crocodylus intermedius*
*Melanosuchus niger*
*Paleosuchus palpebrosus*
*Paleosuchus trigonatus*

CITES entered into force in Venezuela on 21 January 1978.

All crocodilian species are on the Official List of Game Species (*Resolución* MAC-RNR 5-276) established in 1970 and all except *Caiman crocodilus* are subject to an indefinite ban on hunting (see *Resolución* 95 of 1979). *C. crocodilus* remained protected until 1983 when an experimental harvest was established. Hunting was suspended again in 1986 to allow a reassessment of the population (*Resolución* No.61, 23 October 1985), but resumed in 1987 with quotas shown in the table below. A new regulation (*Resolución* No.138, 6 Dec 1990) was introduced to control the harvest in 1991, setting the quota at 91,000. The numbers of skins harvested and the numbers of properties in which hunting was authorized are summarized below (Gorzula, 1989; Medina *in litt.*, 1990). Most of the caiman harvest in Venezuela is carried out on privately-owned land in the Llanos.

| Year | Properties Licensed | Skins Authorized | Skins Harvested |
|---|---|---|---|
| 1983 | 50 | 13,975 | 2,214 |
| 1984 | 55 | 85,233 | 72,612 |
| 1985 | 178 | 235,694 | 232,063 |
| 1986 | Harvest suspended | | |
| 1987 | 197 | 104,260 | 102,689 |
| 1988 | 304 | 153,032 | 152,045 |
| 1989 | 577 | 138,884 | 137,856 |
| 1990 | 493 | 91,861 | 92,000 |
| 1991 | 420 | 138,857 | |

The establishment and operation of farms are controlled by Resolution No.79, 14 June 1990. In recent years, a number of ranching operations have been established to collect eggs and hatchlings of *C. crocodilus* from the wild and rear them in captivity. New regulations drafted in 1992 prohibit the taking of hatchlings from the wild. They provide for 6% of the number of eggs collected to be made available as juveniles for restocking the wild. In early 1992, there were 22 farms registered for the collection of eggs and young of *C. crocodilus* in the states of Apure, Barinas and Cojedes. Seven of these farms also propose to maintain breeding stock.

The number of caiman farms and total production are shown in the table below (MARNR, 1991).

| | 1987 | 1988 | 1989 | 1990 | 1991 |
|---|---|---|---|---|---|
| No.of Farms | 4 | 12 | 10 | 17 | 22 |
| Eggs incubated | 2,886 | 13,534 | 11,004 | 80,643 | |
| Hatchlings produced | 2,104 | 9,417 | 9,572 | 70,909 | |

The two *Crocodylus* species are protected and are not bred commercially but there are captive-breeding operations intended to restock wild populations. *C. intermedius* is bred at Hato Masaguaral, El Frio and the Llanos University (UNELLEZ). Captive-breeding success has been disappointing and it has been decided to collect some eggs and hatchlings from wild populations for head-starting (Ayarzagüena, 1990).

## Campo Alegre

Guasdualito, Paez, Apure, Venezuela
Main Office: Carrera 9 No.7-28 San Cristobal, Edo. Tachira, 5001A

Manager: Manual Fuentes Gilly
Date of Census: 01/01/91

Authorized to produce 239 skins in 1991. Eggs have been collected from the wild in the past but no licence was applied for in 1991.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | - | - | 1200 |

Source of Information: MARNR *in litt.*, 1991 and 1992

## Cañafistolo

Bruzual, Muñoz, Apure, Venezuela
Main Office: Calle 143, Urb La Ceiba, Valencia Edo. Carabobo

Manager: Donaldo Martin

Authorized to collect 600 eggs from the wild in 1991.

Source of information: MARNR *in litt.*, 1992

## El Cedral

Mantecal, Muñoz, Apure, Venezuela
Main Office: Edi. Karem, Av. Urdaneta de Ibarras A. Pelotas, Escritorio Juridico, Alvarez-Gamez-Padron, Piso 7, Caracas.

Manager: Francisco Alvarez Peraza
Date of Census: 01/01/91

Authorized to collect 2960 eggs and to produce 1189 skins in 1991.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | - | - | 1000 |

Source of Information: MARNR *in litt.*, 1991 and 1992

## El Piñal

El Yagual, Achaguas, Apure, Venezuela
Main Office: Frente A Plaza, Bolivar, EDF, Rio Apure, P.H.

Manager: Elias Castro Correa
Date of Establishment: 01/01/91

Authorized to collect 15,552 individuals from the wild and to produce 2315 skins in 1991.

Source of Information: MARNR *in litt.*, 1991 and 1992

## El Torreño

Guasdualito, Paez, Apure, Venezuela
Main Office: Carrera 9 No.7-28 San Cristobal, Edo. Tachira 5001-A

Manager: Manuel Fuentes Gilly
Date of Establishment: 01/01/91
Date of Census: 01/01/91

Authorized to produce 1071 skins in 1991. Eggs have been collected from the wild in the past but no licence was applied for in 1991.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | - | - | 1100 |

Source of Information: MARNR *in litt.*, 1991 and 1992

## La Florida

Biruaca, San Fernando, Apure, Venezuela
Main Office: Adrena, C.A. Calle Bolivar, Frente A Plaza, Bolivar, EDF, Rio Apure, P.H.

Manager: Gilles Robert
Date of Establishment: 01/01/91

Authorized to collect 41,203 eggs from the wild and to produce 6200 skins in 1991.

Source of Information: MARNR *in litt.*, 1991 and 1992

## Mata de Caña

Cunaviche, Pedro Camejo, Apure, Venezuela
Main Office: Calle La Miel, QTA Luisa Maria, San Fernando De Apure, EDO, Apure.

Manager: Carmen Bohorquez de Flores
Date of Establishment: 01/01/91

Operator's licence was suspended in 1991; however, the farm was authorized to produce 522 skins in that year.

Source of Information: MARNR *in litt.*, 1992

## Mata de Guamo

Bruzual, Muñoz, Apure, Venezuela
Main Office: Agrogarca, Avenida 20 Con Calle 41, Barquisimeto, Edo Lara.

Manager: Orlando Saldivia
Date of Establishment: 01/01/90
Date of Census: 01/01/91

Authorized to collect 1500 eggs and to produce 1450 skins in 1991.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | - | - | 1500 |

Source of Information: MARNR *in litt.*, 1991 and 1992

## Mercure

Cunaviche, Pedro Camejo, Apure, Venezuela
Main Office: Av. Francisco de Miranda, Torre Delta, Piso 9, Officina AYB Altamira, Caracas, Apdo. 2835

Manager: Ezequiel Hernandez
Date of Census: 01/01/91

Authorized to collect 1100 eggs and to produce 698 skins in 1991.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | - | - | 2300 |

Source of Information: MARNR *in litt.*, 1991 and 1992

## Merecurito

Apurito, Archaguas, Apure, Venezuela

Main Office: Adrena C.A., Calle Bolivar, Frente A Plaza Bolivar, EDF, Rio Apure, P.H., San Fernando, Edo. Apure.

Manager: Pedro Diaz Rincon
Date of Establishment: 01/01/91

Operator's licence suspended in 1991; however, the farm was authorized to produce 2258 skins in that year.

Source of Information: MARNR *in litt.*, 1991 and 1992

## Providencia

Rincon Hondo, Muñoz, Apure, Venezuela
Main Office: Carrera 9 No.7-28 San Cristobal, Edo. Tachira, 5001-A.

Manager: Manual Fuentes Gilly
Date of Establishment: 01/01/91
Date of Census: 01/01/91

Operator's licence suspended in 1991; however, the farm was authorized to produce 500 skins in that year.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | - | - | 1000 |

Source of Information: MARNR *in litt.*, 1991 and 1992

## San Pedro

San Rafael de Atamaica, San Fernando, Apure, Venezuela
Main Office: Adrena C.A., Calle Bolivar, Frente A Plaza, Bolivar, EDF. Rio Apure, P.H.

Manager: Pablo Foata Sanchez
Date of Establishment: 01/01/91

Authorized to collect 22,000 eggs and to produce 2095 skins in 1991.

Source of Information: MARNR *in litt.*, 1991 and 1992

## Santa Luisa

Biruaca, San Fernando, Apure, Venezuela
Main Office: Centro Ciudad Comercial Tamanaco, Torre B, Piso 10, Officina 1004, Caracas 1064-A

Manager: Carlos Rodriguez Matos
Date of Census: 01/01/91

Authorized to collect 1200 eggs and to produce 1321 skins in 1991.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | - | - | 1000 |

Source of Information: MARNR *in litt.*, 1991 and 1992

## Agropecuaria Kiubo C.A.

Taguay, Urdaneta, Aragua, Venezuela
Main Office: Av. Fco. Solano, Calle Los Mangos, Torre Los Mangos, Piso 1, Offic. 1-B, Sabana Grande, Dtto Federal, Caracas.

Manager: Esther Maria Alviarez
Date of Establishment: 01/01/91

Authorized to collect 2000 eggs in 1991.

Source of Information: MARNR *in litt.*, 1992

## Crocoven C.A. (Hato San Antonio)

Arismendi, Barinas, Venezuela
Main Office: Calle Providencia, EDF. Factory, La Trinidad, Caracas.

Manager: Claude Calderon
Date of Establishment: 01/01/89
Date of Census: 01/06/91
Total Area: *c.* 20 acres (8.09ha), (20 rearing ponds). The farm also has 12 rearing pens and 6 small experimental pens. Food: "Babarina" in pellets from Protinal and minerals from local suppliers

Authorized to collect 7987 hatchlings and 7500 eggs and to produce 5697 skins in 1991.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | - | - | 7500 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.cro | 1989 | - | - | 5000 | - |
| Hatchlings collected | C.cro | 1990 | - | - | - | 500 |

Source of Information: Questionnaire; MARNR *in litt.*, 1991 and 1992

## Finca El Oasis

La Luz, Obispo, Barinas, Venezuela
Main Office: Centro Empresarial Orinoco, Piso 2 Ofic. 21, La Urbina, Caracas 1070.

Manager: Lucas Leopald Azpurua
Date of Establishment: 01/01/88
Date of Census: 31/12/89

Total Area: 2000 hectares (14 breeding ponds)
Food: Red meat, fish and minerals/vitamins

Authorized to collect 1260 eggs and to produce 522 skins in 1991.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | 954 | 700 | - | - | 1654 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.cro | 1988 | - | 650 | 5300 | - |
| Eggs collected | C.cro | 1988 | - | 345 | 980 | - |

Source of Information: Questionnaire; Baez de Azpúrua and Michelangeli, 1990; MARNR *in litt.*, 1992

## Santa Marta

Ignacio Briceno, Peraza, Barinas, Venezuela

Manager: Gustavo Cardenas Gil
Date of Establishment: 01/01/90
Date of Census: 01/01/91

Authorized to collect 2280 eggs from the wild in 1991.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | - | - | 3600 |

Source of Information: MARNR *in litt.*, 1991 and 1992

## Agropecuria Las Caobas C.A.

Romulo Gallegos, San Carlos, Cojedes, Venezuela
Main Office: Carretera Las Vegas - Via Titado, San Carlos, Edo. Cojedes.

Manager: Antonio Rios Rodriguez
Date of Establishment: 01/01/91

Authorized to collect 2400 eggs from the wild in 1991.
Source of Information: MARNR *in litt.*, 1992

## El Milagro

El Pao, El Pao, Cojedes, Venezuela

Manager: Gabriel Zuloaga
Date of Establishment: 01/01/90

Eggs have been collected from the wild in the past but no licence was applied for in 1991. The Farm is unoperational.

Source of Information: MARNR *in litt.*, 1991 and 1992

## La Esperanza

El Baul, Girardot, Cojedes, Venezuela
Main Office: Carretera El Baul-Arismendi, El Baul, EDO. Cojedes.

Manager: Daniel Cabrera Hernandez
Date of Establishment: 01/01/91
Date of Census: 01/01/92

Authorized to collect 3300 eggs and to produce 2059 skins in 1991.

Source of Information: MARNR *in litt.*, 1992

## Piñero

El Baul, Girardot, Cojedes, Venezuela
Main Office: Ed. General, Piso 6, Of 6B Av. La Estancia, Chuao, Apdo. 64597, Caracas 1060.

Manager: Antonio Julio Branger
Date of Establishment: 01/01/90
Date of Census: 01/01/91

Eggs have been collected from the wild in the past but no licence was applied for in 1991. This farm is unoperational.

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.crocodilus* | - | - | - | - | 120 |

Source of Information: MARNR *in litt.*, 1991 and 1992

## Veladero

Libertad, Ricaurte, Cojedes
Main Office: Carretera Las Vegas-Via Tirado, San Carlos, EDO. Cojedes.

Manager: Daniel Cabrera Hernandez
Date of Establishment: 01/01/91

Authorized to collect 13,110 eggs from the wild in 1991.

Source of Information: MARNR *in litt.*, 1992

Species present: *Crocodylus porosus*
*Crocodylus siamensis*

Viet Nam is not a Party to CITES.

Ministry of Forestry Regulation No.276 QD, 2 June 1989 prohibits the capture of all native crocodiles and the export of their skins (Nguyen *in litt.*, 1990).

There are said to be a number of small crocodile farms in Viet Nam, each holding around 40-50 animals. The species involved are unclear, but the original stock are said to have been captured in the plateau areas and the south-east of the country. In the plateau the only species likely to occur is *C. siamensis*, while *C. porosus* occurs in the Mekong Delta (Nguyen *in litt.*, 1990). No further details of the husbandry techniques or production are known.

Some Cuban Crocodiles have also been imported and are being farmed experimentally in five or six forest sanctuaries. In 1985, 107 *C. rhombifer* (6 breeding adults, 101 sub-adults) were sent from Cuba to Viet Nam as a diplomatic exchange of gifts. Four, including two of the adults, died in transit and most of the remainder survive (Luxmoore and Rodriguez, 1991).

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*
*Osteolaemus tetraspis*

CITES entered into force in Zaire on 18 October 1976.

Protection is given under *Loi portant réglementation de la chasse* of 28 May 1982. The taking of *C. cataphractus* and *C. niloticus* less than 1.5m long is prohibited, and *O. tetraspis* specimens less than 0.5m long are partially protected: they may be taken under permit. The export of protected animals without the special authorization of the Minister of Agriculture is prohibited. Possession of, and national trade in, these species is prohibited; international trade is prohibited or regulated.

There are believed to be no commercial crocodile farms in Zaire, although one was proposed to the south of Virunga National Park, planning to use meat from a Hippopotamus culling operation (Mertens *in litt.*, 1990). So far as is known, this plan has not progressed.

Species present: *Crocodylus cataphractus*
*Crocodylus niloticus*

CITES entered into force in Zambia on 22 February 1981.

*C. niloticus* was transferred from CITES Appendix I to II on 29 July 1983 under the special criteria set out in Resolution Conf. 5.21 subject to annual quotas. The following quotas were agreed by the Conference of the Parties. The population was retained in Appendix II under the conditions of Resolution Conf. 3.15 on ranching on 18 January 1990.

| Annual quota | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|
| Wild | 2000 | 2000 | 2000 | 2000 |
| Ranched | | 1350 | 3600 | 6200 |

Crocodiles are partially protected under the National Parks and Wildlife Acts of 3 December 1968. They are considered to be dangerous animals; any person who wounds such an animal must report the circumstances to the authorities. Imports and exports are prohibited except with a valid permit.

The crocodile farming industry is undergoing rapid expansion in Zambia, and there are now said to be ten farms established (Simbotwe, 1991).

## Chimba Crocs

P.O. Box 21491, Kitwe, Zambia

Manager: M. Freed

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | - | - | - | - | - | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Eggs collected | C.nil | - | 1127 | - | - | - |

Source of Information: Anon., 1989c

## Gwembe Crocodiles

P.O. Box 630162, Choma, Zambia

Manager: I.M. Brookes

The farm was allocated a quota to collect 1650 *C. niloticus* eggs in 1990 and to establish a breeding unit of 50 crocodiles.

Source of Information: Brooks, 1990

## Kalimba Crocodile Ranch

P.O. Box 30131, Lusaka, Zambia

Manager: J.W. Thomas
Date of Establishment: 01/01/85
Date of Census: 01/01/88

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 201 | 1179 | - | - | 1380 |

Source of Information: Anon., 1989c

## Kariba Crocodile And Fish Farms Ltd

P.O. Box 34284, Lusaka, Zambia

Manager: K.T. Malinki
Date of Establishment: 01/01/80
Date of Census: 01/01/88

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 1099 | 849 | 5 | 20 | 1973 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.nil | - | 300 | 500 | - | - |

Source of Information: Anon., 1989c

## Luangwa Crocodile and Safaris

P.O. Box 37542, Lusaka, Zambia

Manager: K. Asherwood and C. Beukes
Date of Census: 31/12/89

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | - | - | - | - |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.nil | - | 5253 | - | - | - |

Source of Information: Anon., 1989c

## Sumbu Crocodile Farm

P.O. Box 17, Siavonga, Zambia

Manager: Melvern Vlahalis
Date of Establishment: 01/01/86
Date of Census: 01/01/91
Total Area: (5 breeding ponds, 4 rearing ponds)
Food: Kapenta from Lake Kariba

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 2800 | 1500 | 12 | 20 | 4332 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1989 | - | - | 201 | - |
| Eggs collected | C.nil | 1986 | 1660 | - | 2377 | - |

Source of Information: Questionnaire

## Zongue Farming Enterprises

P.O. Box 650066, Chisekesi, Zambia

Manager: Johann Jordaan
Date of Establishment: 01/08/88
Date of Census: 01/01/90
Total Area: 5 hectares (5 breeding ponds, 12 rearing ponds)
Food: Fish (kapenta) from own fishing operation and goat meat

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | 2076 | 1351 | - | - | 3428 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Eggs collected | C.nil | 1988 | - | 2282 | 2966 | - |

Source of Information: Questionnaire

Species present: *Crocodylus niloticus*

CITES entered into force in Zimbabwe on 17 August 1981.

*C. niloticus* was transferred from CITES Appendix I to II on 29 July 1983 under the conditions of Resolution Conf. 3.15 on ranching.

In Zimbabwe, crocodiles are under the Parks and Wildlife Act (1975). Hunting, egg collection, import and export are regulated by permit. The harvesting of wild laid eggs to supply ranches is strictly controlled. Initially a quota system was adopted, but this was replaced in 1989 by a system of unlimited access to eggs in certain areas, subject to permits.

## ABC Crocodiles

P.O. Box 8067, Causeway, Zimbabwe

Manager: J. Tiffan
Date of Establishment: 01/01/89
Date of Census: 31/12/90
Food: Fallen stock

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | - | - | - | 86 |

Source of Information: Hutton *in litt.*, 1991

## Baobab Investments

P.O. Box 246, Chiredzi, Zimbabwe

Date of Establishment: 01/01/89
Date of Census: 31/12/90
Food: Fallen stock

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 480 | 917 | ----(22)---- | | 1419 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1990 | - | - | - | 482 |

Source of Information: Hutton *in litt.*, 1991

## Carswell Crocodiles

P.O. Box A100, Avondale, Zimbabwe

Manager: M. Vallaro
Date of Establishment: 01/01/87
Date of Census: 31/12/89
Food: Abattoir waste

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 1486 | 2495 | ----(91)---- | | 3990 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | - | - | - | 40 | 30 |
| Eggs collected | C.nil | - | 751 | - | 430 | 1203 |
| Skins produced | C.nil | - | - | - | - | 2 |

Source of Information: Questionnaire; Hutton, 1990 and 1991 and *in litt.*, 1991

## Horsley Enterprises

P.O. Box 234, Mhangura, Zimbabwe

Manager: B.F.A. Horsley
Date of Establishment: 01/01/89
Date of Census: 31/12/90

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 1074 | 603 | - | - | 1677 |

Source of Information: Hutton *in litt.*, 1991

## Royal Bucks

P.O. Box 20, Raffingora, Zimbabwe

Manager: R.W.J. Ashburner
Date of Establishment: 01/01/89
Date of Census: 31/12/90

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | 218 | - | - | 218 |

Source of Information: Hutton *in litt.*, 1991

## Ruware Ranch

P.O. Box 190, Chiredzi, Zimbabwe

Manager: A. de la Rue
Date of Establishment: 01/01/90
Date of Census: 31/12/90

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | 13 | - | - | 37 |

Source of Information: Hutton *in litt.*, 1991

## Sengwa Mouth Rearing Station

Sengwa Mouth, P.O. Box 191, Harare, Zimbabwe

Manager: R. van der Riet
Date of Establishment: 01/01/77
Date of Census: 31/12/89
Food: Kapenta from Lake Kariba

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 7075 | 16047 | ----(64)---- | | 17168 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1980 | 432 | 866 | 1850 | 2090 |
| Eggs collected | C.nil | 1978 | 5244 | 6773 | 6906 | 7444 |
| Skins produced | C.nil | - | 1097 | 2036 | - | 3359 |

Source of Information: Questionnaire; Hutton, 1988, 1989a, 1990 and 1991

## Sijarira

P.O. Box 467, Bulawayo, Zimbabwe

Manager: Forestry Commission
Date of Establishment: 01/01/85
Date of Census: 31/12/90

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | 118 | ----( 8)---- | | 126 |

Source of Information: Hutton *in litt.*, 1991

## Tarnagulla

P.O. Box 27, Darwendale, Zimbabwe

Manager: D. Bruk-Jackson
Date of Establishment: 01/01/89

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | 41 | - | - | 41 |

Source of Information: Hutton *in litt.*, 1991

## Triandra Farm

P.O. Box EH 29, Emerald Hill, Zimbabwe

Manager: C. Foot
Date of Establishment: 01/01/89
Date of Census: 31/12/90

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | 324 | - | - | 324 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Eggs collected | C.nil | 1990 | - | - | - | 708 |

Source of Information: Hutton *in litt.*, 1991

## Pangoula

P.O. Box AY 73, Amby, Harare, Zimbabwe

Manager: C. Bradshaw
Date of Establishment: 01/01/90
Date of Census: 31/12/90

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 50 | 65 | - | - | 114 |

Source of Information: Hutton *in litt.*, 1991

## Game and Fishing (Pty) Ltd

Ume River Station, P.O. Box 55, Kariba, Kariba, Zimbabwe

Manager: Astra Wildlife
Date of Establishment: 01/01/82
Date of Census: 01/01/90
Food: Freshwater sardine - Kapenta from Lake Kariba

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 4671 | 5365 | ----(146)---- | | 5978 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | - | 503 | 454 | 548 | 9061 |
| Eggs collected | C.nil | 1982 | 4063 | 3928 | 3585 | 2672 |
| Skins produced | C.nil | - | 1582 | 1851 | 1873 | 1817 |

Source of Information: Questionnaire; Hutton 1989a, 1990 and 1991 and *in litt.*, 1991

## Lake Crocodile Park

P.O. Box 55, Kariba, Kariba, Zimbabwe

Manager: Astra Wildlife
Date of Establishment: 01/01/65
Date of Census: 31/12/89
Food: Freshwater sardine - Kapenta from Lake Kariba

Formerly known as Kariba Crocodile Farm.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 4148 | 8536 | ----(125)---- | | 12809 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1970 | 583 | 599 | 1145 | 1225 |
| Eggs collected | C.nil | 1966 | 3489 | 5701 | 4322 | 4221 |
| Skins produced | C.nil | - | - | - | 2256 | 1871 |

Source of Information: Questionnaire; Hutton, 1988, 1989a and 1991 and *in litt.*, 1991

## Dilrich

P. Bag 2025, Concession, Mashonaland Central, Zimbabwe

Manager: S. Philip
Date of Establishment: 01/01/89
Date of Census: 31/12/90

Formerly Passaford Ostrich Company, or Old Bull Wildlife.

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | 400 | - | - | 400 |

Source of Information: Hutton *in litt.*, 1991

## Lion's Den Crocodiles

P.O. Box 26, Shamva, Mashonaland Central, Zimbabwe

Manager: K. Bruk-Jackson
Date of Establishment: 01/01/89
Date of Census: 31/12/90
Food: Fallen stock

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | 448 | - | - | 448 |

Source of Information: Hutton *in litt.*, 1991

## Barnhill Estate

P.O. Box 417, Marondera, Mashonaland East, Zimbabwe

Manager: I.S. Hunter
Date of Establishment: 01/01/87
Date of Census: 31/12/89
Food: Waste beef - fallen animals

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 688 | 566 | ----(15)---- | | 1269 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | - | - | - | 213 | 283 |
| Skins produced | C.nil | 1990 | - | - | - | 316 |

Source of Information: Questionnaire; Hutton, 1990 and 1991

## Fern Spruit Crocodiles

P.O. Box HG 133, Highlands, Mashonaland East, Zimbabwe

Manager: Tug Morkel
Date of Establishment: 01/01/89
Date of Census: 31/12/90

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | 443 | - | - | 443 |

Source of Information: Hutton *in litt.*, 1991

## Lion Park

P.O. Box 733, Harare, Mashonaland East, Zimbabwe

Manager: V.H. Bristow
Date of Establishment: 01/01/83
Date of Census: 01/12/90
Food: Chicken from chicken farms

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 1186 | 3367 | ----(118)---- | | 4671 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | - | 452 | 470 | 451 | 416 |
| Eggs collected | C.nil | - | 290 | 1353 | 483 | - |
| Skins produced | C.nil | - | 201 | 155 | 130 | 200 |

Source of Information: Questionnaire; Hutton, 1988, 1989b, 1990 and 1991 and *in litt.*, 1991

## Pine Farm

P.O. Box MR 121, Harare, Mashonaland East, Zimbabwe

Manager: R. Hangartner
Date of Establishment: 01/01/89
Date of Census: 31/12/90

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | 213 | ----( 3)---- | | 216 |

Source of Information: Hutton *in litt.*, 1991

## Elladale Farm

P.O. Box 130, Norton, Mashonaland West, Zimbabwe

Manager: D. Pascall
Date of Establishment: 01/01/89
Date of Census: 31/12/90

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 796 | 276 | ----(22)---- | | 1094 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1989 | - | - | 275 | 504 |

Source of Information: Hutton *in litt.*, 1991

## Keiray Crocodiles

P.O. Box 38, Darwendale, Mashonaland West, Zimbabwe

Manager: K. Swales
Date of Establishment: 01/01/89
Date of Census: 31/12/90

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | - | 227 | - | - | 227 |

Source of Information: Hutton *in litt.*, 1991

## Malham Farm

P.O. Box 108, Norton, Mashonaland West, Zimbabwe

Manager: A. Riley
Date of Establishment: 01/01/86
Date of Census: 31/12/90
Food: Waste beef from fallen animals and abattoirs

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total |
|---|---|---|---|---|---|
| *C.niloticus* | 1782 | 2807 | ----(12)---- | | 4601 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | - | - | - | 112 | 58 |
| Eggs collected | C.nil | - | - | 1732 | 2326 | 2231 |
| Skins produced | C.nil | - | - | - | 206 | 613 |

Source of Information: Questionnaire; Hutton, 1988, 1989a, 1990 and 1991

## Manyame Crocodiles

P.O. Box 18, Banket, Mashonaland West, Zimbabwe

Manager: R. Conway
Date of Establishment: 01/01/88
Date of Census: 31/12/89
Food: Waste meat from local abattoirs

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | 2422 | 2502 | ----(23)---- | | 4947 | |
| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
| Eggs collected | C.nil | 1989 | - | - | 3400 | - |

Source of Information: Questionnaire; Hutton, 1990 and 1991

## Mazwikadei Crocodiles

P.O. Box 319, Chinhoyi, Mashonaland West, Zimbabwe

Manager: Q. De Jager
Date of Establishment: 01/01/89
Date of Census: 31/12/90

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | - | 832 | ----( 2)---- | | 834 | |
| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
| Eggs collected | C.nil | 1990 | - | - | - | 157 |

Source of Information: Hutton *in litt.*, 1991

## Chiredzi Wildlife Investments

P.O. Box 241, Chiredzi, Masvingo, Zimbabwe

Manager: I. Rule
Date of Establishment: 01/01/85
Date of Census: 31/12/89
Food: Game meat and beef waste from local ranches

| | Stock on Farm | | Adult | Adult | Total | |
|---|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | | |
| *C.niloticus* | 8101 | 8113 | ----(123)---- | | 16337 | |
| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
| Captive breeding | C.nil | - | 85 | 631 | 1507 | 2545 |
| Eggs collected | C.nil | - | 3245 | 5169 | 6981 | 7637 |
| Skins produced | C.nil | - | - | 13 | 521 | 1113 |

Source of Information: Questionnaire; Hutton, 1988, 1989a, 1990 and 1991 and *in litt.*, 1991

## La Lucie

P.O. Box 51, Chiredzi, Masvingo, Zimbabwe

Manager: B. Fay d'Herbe
Date of Establishment: 01/01/89
Date of Census: 31/12/90

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 202 | 438 | ----(24)---- | | 664 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1990 | - | - | - | 278 |

Source of Information: Hutton *in litt.*, 1991

## Mokambi Wildlife

P.O. Box 129, Chiredzi, Masvingo, Zimbabwe

Manager: N. Pentolfe
Date of Establishment: 01/01/86
Date of Census: 31/12/89
Food: Waste beef and game meat

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 3479 | 5819 | ----(87)---- | | 9385 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | - | - | 285 | 1035 | 1494 |
| Eggs collected | C.nil | - | 407 | 615 | 763 | 899 |
| Skins produced | C.nil | - | - | 44 | 1327 | 2543 |

Source of Information: Questionnaire; Hutton, 1988, 1989a, 1990 and 1991 and *in litt.*, 1991

## Binga Crocodile Farm

P.O. Box 16, Binga, Matabeleland North, Zimbabwe

Manager: A. Van Jaarsvelatt
Date of Establishment: 01/01/67

Date of Census: 31/12/89
Food: Kapenta from Lake Kariba

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 4416 | 8094 | ----(70)---- | | 10641 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | 1980 | 669 | 654 | 1061 | 1276 |
| Eggs collected | C.nil | 1968 | 6551 | 7900 | 8697 | 8541 |
| Skins produced | C.nil | - | 2654 | 2844 | 2827 | 3889 |

Source of Information: Questionnaire; Hutton, 1988, 1989a, 1990 and 1991 and *in litt.*, 1991

## Chelsea Products

P.O. Box 420, Bulawayo, Matabeleland North, Zimbabwe

Manager: H. Lok
Date of Establishment: 01/01/89
Date of Census: 31/12/90

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | - | 242 | - | - | 242 |

Source of Information: Hutton *in litt.*, 1991

## Sikumi Spa Crocodiles

P.O. Box 20, Gwayi, Matabeleland North, Zimbabwe

Manager: H. De Vries
Date of Establishment: 01/01/87
Date of Census: 31/12/89
Food: Game meat

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total | |
|---|---|---|---|---|---|---|
| *C.niloticus* | 1596 | 2733 | - | - | 4329 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Eggs collected | C.nil | - | 1049 | 1049 | 2164 | 1785 |

Source of Information: Questionnaire; Hutton, 1988, 1989a, 1990 and 1991

## Spencer's Creek Crocodiles

P.O. Box 18, Zambezi River, Victoria Falls, Matabeleland North, Zimbabwe

Manager: R. Gee
Date of Establishment: 01/01/71
Date of Census: 31/12/89
Food: Beef, game, meat, offal and fish meal from local sources

| | Stock on Farm Hatch | Imms | Adult Male | Adult Female | Total | |
|---|---|---|---|---|---|---|
| *C.niloticus* | 6875 | 9116 | ----(126)---- | | 16140 | |
| | **Spp.** | **1st** | **1987** | **1988** | **1989** | **1990** |
| Captive breeding | C.nil | 1970 | 1943 | 2293 | 3168 | 3512 |
| Eggs collected | C.nil | 1974 | 1993 | 3748 | 7243 | 11735 |
| Skins produced | C.nil | - | 1438 | 1627 | 2412 | 1844 |

Source of Information: Questionnaire; Hutton, 1988, 1989a, 1990 and 1991 and *in litt.*, 1991

## Shamva Crocs

P.O. Box 450, Masvingo, Victoria, Zimbabwe

Manager: G. Rae
Date of Establishment: 01/01/87
Date of Census: 31/12/89
Food: Waste beef from abattoir

| | Stock on Farm | | Adult | Adult | Total |
|---|---|---|---|---|---|
| | Hatch | Imms | Male | Female | |
| *C.niloticus* | 1153 | 816 | ----(10)---- | | 1979 |

| | Spp. | 1st | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Captive breeding | C.nil | - | - | - | 24 | 94 |
| Eggs collected | C.nil | 1990 | - | - | 467 | 751 |

Source of Information: Questionnaire; Hutton, 1990 and 1991

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