

The Caiman Trade

by Peter Brazaitis, Myrna E. Watanabe
and George Amato



A small, sleek handbag is prominently displayed in the showcase of a posh Madison Avenue store in New York City. Its \$3,700 price tag tells the cognoscenti that the bag is made of real crocodilian skin, not printed calfskin. Only a handful of experts in the world may look at this handbag and know that although the glossy front is made of high-quality, legal American alligator skin, the sides are made from cheaply produced caiman leather. And the latter may have come from the largely contraband trade in skins.

Traffic-USA, a branch of the World Wildlife Fund that tracks the trade in contraband wildlife products, conservatively estimates the worldwide market for crocodilian skins at 1.5 to two million a year. Yet according to Don Ashley, a trade consultant in Tallahassee, Fla., in 1993 only about a million of those skins had legal documentation from the country of origin. So up to half of the skins that make up those expensive handbags, wallets and belts may have been harvested from wild ani-

mals, in violation of national or international laws. The bulk of these illegal skins comes from members of the genus *Caiman*.

The "alligator look" has historically projected luxury and affluence. Though always in style, the look is touted by the fashion industry in cycles of three to five years, periodically increasing the demand for all crocodilian-skin products. Figures for international trade in caiman skin, legal or illegal, were unavailable until 1993 (and these are still the only numbers available). Whereas "user" countries such as the U.S. reported the import of 648,847 skins, the World Conservation Union, known as the IUCN, found that only 556,132 skins had been legally exported that year. Clearly, some of those imported skins had fraudulent documents. The IUCN further estimated the actual trade in caiman hides to be at least one million a year, nearly 50 percent greater than the legal output.

The illegal trade in caimans is pervasive because it is

*The contraband trade in caiman skins shows how
“sustainable utilization” of endangered species fails to sustain them*



FRANS LANTING/Minden Pictures

YACARÉ CAIMAN, boasting an intricate pattern of scales on its sides, is a favorite target of hunters. The animals are easy to kill during the dry season, when they congregate in a few shallow pools.

so lucrative. Crocodylians may be ranched or farmed, as many in the U.S. are. The handbag in the Madison Avenue shop was made from the belly skin of an American alligator that may have netted the farmer or legal hunter several hundred dollars. The caiman skin—whether legally acquired from one of the ranches now mushrooming in Central and South America or illegally hunted from surrounding areas—may have cost anywhere from \$5 to \$50. But products made of caiman skin sell for as much as those of alligator skin.

Classifying Caimans

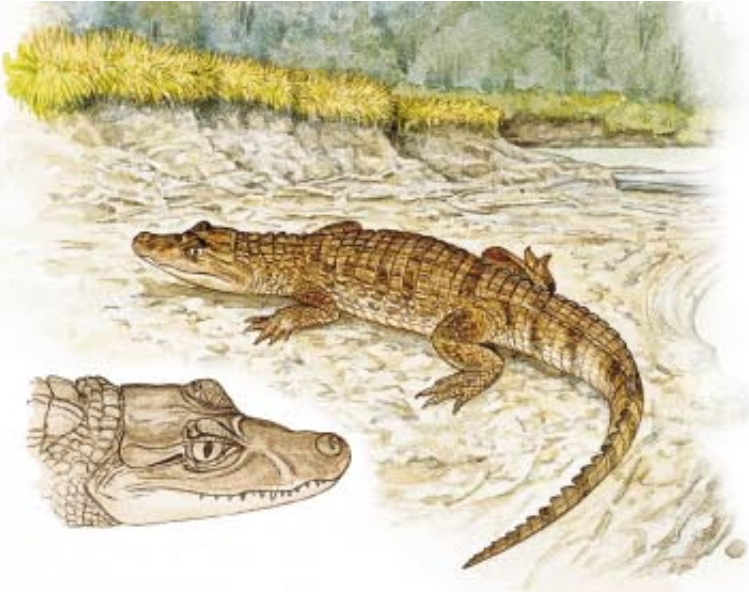
The crocodylians are members of the archosaurs, or ruling reptiles, the group that dominated the earth 200 million years ago. Most of the roughly 23 species of crocodylians are threatened or endangered, mainly as a result of habitat loss and excessive hunting.

Modern crocodylians are divided into three families:

the true crocodiles (Crocodylidae), the gharials (Gavialidae) and the alligators (Alligatoridae). The last includes the American alligator, its near relative the diminutive Chinese alligator and the caiman. Caimans inhabit the freshwater rivers, streams, lakes, ponds and wetlands throughout tropical Central and South America and some of the Caribbean islands.

Three genera constitute the family of caimans. The first contains only one species, the giant—and now critically endangered—black caiman, *Melanosuchus niger*. The second, *Paleosuchus*, contains two species with such heavy bony plates within their scales that their hides are commercially unusable. The third, *Caiman*, contains a variety of species, most of them fairly small animals ranging from 1.2 to 2.8 meters (four to nine feet) in length.

Much controversy rages over the classification of caimans. Until a recent survey conducted by one of us (Brazaitis) and his colleagues, no studies correlated the dis-



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DUSKY CAIMANS grow to two meters (6.5 feet) in length and occupy a spectrum of habitats. Until quite recently, they were safe from the pressures of commerce because their hides are of relatively poor quality. But as species with more desirable skins become rare, the demand for dusky caiman skin is increasing. Wild populations in Colombia, where most hides come from, have fallen.

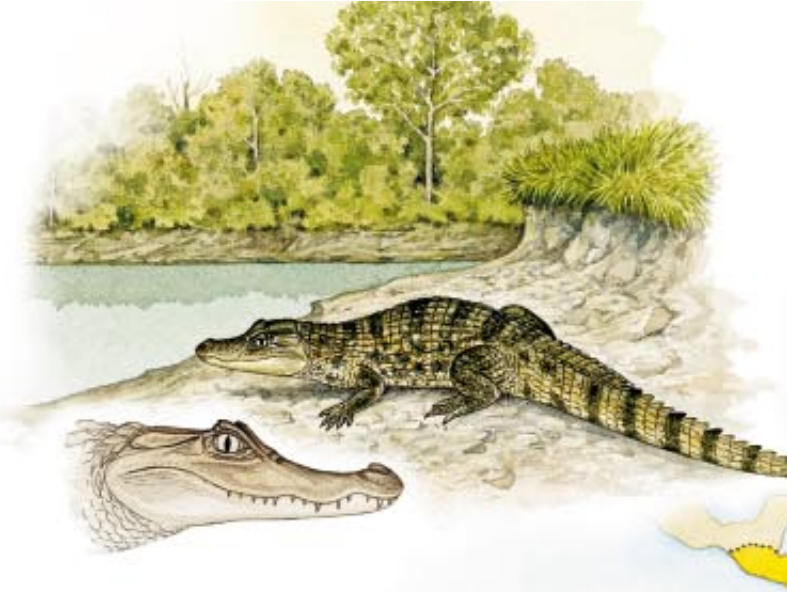
tribution of caimans in South America's river systems with their scale patterns, morphology and DNA characteristics. Robert Madden of Marymount College in Tarrytown, N.Y., has statistically analyzed the new data on structure, scale and color patterns; in a complementary study, another of us (Amato) and his colleagues at the Wildlife Conservation Society and the American Museum of Natural History have studied DNA from caiman tissues and blood. Contrary to the prevailing wisdom that the genus *Caiman* held only two distinct species, their results support the existence of four. Furthermore, the researchers supplied specifications for distinguishing among the species, a great aid to law-enforcement officials who were confounded by the variety within the species.

The common caiman (also called the spectacled caiman), *Caiman crocodilus*, mainly occurs in the drainage basins of the Amazon and Orinoco rivers. The dusky or brown caiman, *Caiman fuscus*, ranges from Mexico down to Peru, being isolated from the common caiman by the Andes Mountains. Both species are separated by scattered uplands and the Brazilian shield from the Yacaré caiman, *Caiman yacare*. The fourth member of the group, the broad-snouted caiman, or *Caiman latirostris*, roams river systems along the eastern uplands, coastal and southern tropical regions of South America.

A Watchful Parent

A hundred years ago explorers traveling through Brazil spoke of caimans stretched out one next to another, carpeting the banks of the Amazon River. Black caimans, reaching almost seven meters in length, were especially numerous, and occasionally picked off humans who ventured too close to the water's edge. Today caimans are abundant in some isolated regions but extirpated (that is, locally extinct) in others.

The annual wet season typically signals the time for breeding. Males vocalize and establish territories, within which one or more females build their nests. Sometimes more than two meters wide and half a meter high, the nests lie on high ground



COMMON CAIMANS are wily and opportunistic, favoring varied habitats and diets. But a recent survey in Brazil found no common caimans at all in some regions where they had once been, in fact, common. The animals grow up to 2.5 meters (eight feet) in length. Most legal skins of common caimans come from Venezuela, and most illegal skins from Brazil. Some skins show high levels of lead. The habitat is also contaminated with mercury.

above flood levels but not far from the water. They are made of grasses, twigs and mud, usually in dense thickets or brush.

The decomposing organic material of the nest provides temperatures of 28 to 32 degrees Celsius (82 to 90 degrees Fahrenheit) throughout the incubation period of about eight to 10 weeks. Females lay 20 to 30 eggs in the nest at the peak of the rainy season, guarding them vigilantly, while males often patrol the vicinity. When hatching time nears and the baby caimans call from within the eggs, a female will excavate her nest to liberate the hatchlings, sometimes carrying them gently in her mouth to the seclusion of a nearby nursery pool.

Baby caimans stay with their parents for protection throughout most of the first year and are often seen riding on their backs. Juveniles and young adults feed on terrestrial invertebrates and, as they grow, large numbers of snails (a common food for many species of young crocodylians worldwide). Snails harbor the *Schistosoma* parasite, and some anecdotal evidence suggests that caiman predation on snails may help control schistosomiasis, a major tropical disease in humans and domestic animals.

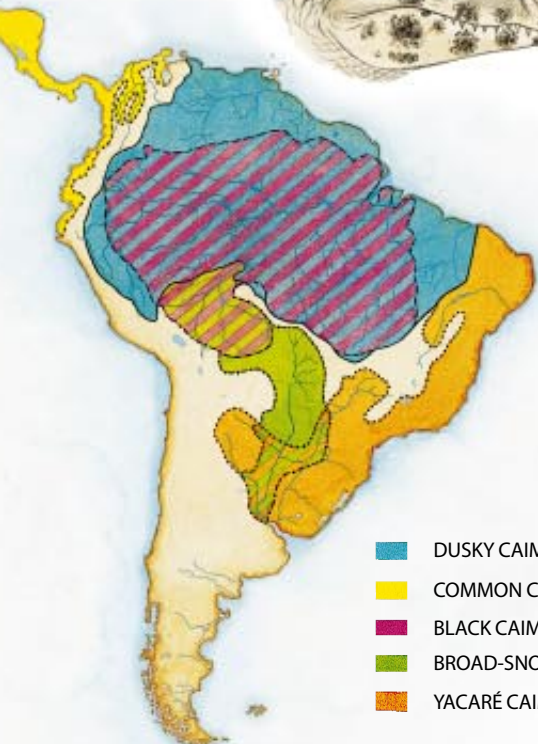
Despite the parental attention, the hatchlings often become a meal for many other species. Turtles, predatory fish such as piranhas, aquatic birds and snakes hunt very young caimans. If statistics from wild American alligator populations are taken as examples, perhaps 50 percent or more of all hatchlings are killed by predators during the first year of life.

Those caimans that grow larger eat fish that are not likely to find their ways into the human diet, such as armored catfish and some eels, as well as potentially dangerous species, such as piranhas. Without population control by these predators, many of these fish species would outcompete those eaten by humans. Moreover, caimans readily switch to feeding on whatever is available. Thus, they are well adapted to an environment in which water resources vary tremendously over the year.

In the rainy season, caimans fan out into swamps and forests; in the dry season, they excavate the few pools that re-



BLACK CAIMANS can grow to six meters (19 feet) and are capable of attacking humans. The animals have no fear of people, however, and are easy to kill. They require a very specific habitat: open rivers or oxbow lakes bordered with thick vegetation. They begin to procreate at the rather advanced age of 12 years. As a result, once they are extirpated, populations do not recover.



BROAD-SNOURED CAIMANS are nearly extinct because of habitat loss and pollution, and also because their hides provide a soft leather with a "marshmallow" feel. The animals may grow to 2.3 meters (7.5 feet). Little is known about these creatures in the wild because so few have been located for study. Although currently banned from commercial trade, they are farmed in Argentina.



main and congregate there. By doing so, not only do they make themselves a home, they also provide a refuge for fish, amphibians, aquatic invertebrates and plants. Often the only sources of aquatic food, the ponds attract migratory birds that feast on the fish and invertebrates.

Caimans may live to be 65, although very few actually do. Adult caimans are sometimes eaten by anacondas. But human predation is a far more important factor in the species' demise. Local consumers take the medium-to-large animals for food; hunters kill larger animals for their skins.

An IUCN report notes that wild populations of the common caiman are declining in half of the 16 countries where it occurs. The Yacaré, broad-snouted and black caimans are depleted, the latter two severely, in all their range countries. This situation is a result of human encroachment on their habitat and nearly half a century of poaching.

The international trade in all wildlife, including caimans (whether live animals for pets or dead ones for meat, skins and other products), is regulated by CITES, the Convention on International Trade in Endangered Species of Wild Fauna



YACARÉ CAIMANS reach a maximum of 2.5 meters (eight feet) in length. They are the primary source of skin for the crocodilian leather industry. Although banned from trade in the U.S., their import may soon be legalized. The species is widespread, but wild populations are declining.



DUSKY CAIMAN



COMMON CAIMAN



BLACK CAIMAN



BROAD-SNOUDED CAIMAN



YACARÉ CAIMAN



ROBERTO OSTI

UNIQUE PATTERNS of scales on the flanks are useful for identifying caiman skins. Dusky caimans have uniform rows of oval scales alternating with rows of small, beadlike scales. Common caimans have narrow flanks with strongly keeled (that is, raised), large scales laid in rows, separated by soft, creased skin and tiny scales. Black caimans have wide flanks with numerous rows of slightly elongated, poorly keeled scales. The softest leather from these animals is that of the smooth, white belly (*not shown*). Broad-snouted caimans have a few rows of large, bony scales alternating with small, bony scales. Yacaré caimans have wide flanks with mostly smooth, round scales that lie in close rows separated by a chainlike pattern of creased skin. For all the skins depicted, the animals' heads point to the left.

and Flora. National laws, such as those in the country of origin of the animals or the Endangered Species Act in the U.S., also apply. CITES uses the available data on a species to classify it into one of three groups. Appendix I animals are not allowed in international commerce. Appendix II animals are permitted only with CITES documentation issued by government authorities in the country of origin (or, if the animal originates in a different country, with appropriate permits for reexport). Appendix III animals may be traded without such stringent requirements. The broad-snouted caiman, the Rio Apaporis caiman (a subspecies of the common caiman) and the black caiman are listed as CITES Appendix I species. The remainder of the caimans are CITES Appendix II.

Differentiating what is legal from what is not gets very messy. Many countries export skins that could never have originated there—but with legal documentation claiming otherwise. It may transpire, for instance, that a skin exported from Colombia is declared as a common caiman when it is actually a Yacaré, which does not occur in Colombia. There may even be a brisk trade in illegal documentation: CITES export forms are sometimes reported lost.

When the U.S. Fish and Wildlife Service seizes caiman skins or products on suspicion that they are illegal, it often engages the services of a caiman specialist. Brazaitis is one such taxonomist in the U.S. To prosecute the owners, the service must identify the species of each item in the shipment—and there may be thousands. That is not an easy task, because the Yacaré and the various subspecies of the common caiman have skins that look extraordinarily alike. Once tanned and dyed, they no longer maintain the color patterns unique to the species. To make matters more difficult, odd strips of skin pieced together on leather goods may not include definitive characteristics for identification.

In 1969 Brazaitis and F. Wayne King of the University of Florida at Gainesville, both then at the Bronx Zoo, began to develop tools to differentiate between the species. By 1984 they had part of the problem licked. Caimans have thick, bony plates called osteoderms within the belly scales, which clearly distinguish the group from other crocodylians. The flanks, between the front and hind legs, along with the sides of the tails, are less bony and make supple leather. These pieces, used most often in products, are key to distinguishing endangered caimans. But more information was needed.

In the mid-1980s the United Nations Environmental Program, along with individual governments and CITES, funded an ambitious project to identify and quantify caiman populations in Brazil, Bolivia and Paraguay. Brazaitis led a Brazilian team that included, among many biologists, George Rebêlo of the National Institute for Investigation of the Amazon (INPA) and Carlos Yamashita of the Brazilian Institute for Environment and Renewable and Natural Resources (IBAMA). The team located caiman populations and collected blood, muscle, skin and other tissues from animals in the wild, as well as some destined for local residents' stew pots and ones found dying of pollution or of injuries inflicted by hunters. (The wild animals were captured and released after study. If they were extremely sick, we humanely euthanized them.)

The tissue samples are useful not only for classifying caimans but also for providing an accurate means of identifying untanned skins. In the near future, the U.S. Fish and Wildlife Service will probably be able to utilize DNA evidence such as that obtained by Amato to identify tanned leather from endangered species.

Over the course of five years, our team found that, much to our surprise, some previously known populations of caimans were entirely gone. Of the remainder, the bulk of animals at the sites studied were very young. Few adult caimans were seen. Because we surveyed the animals in both the rainy season, when caimans are dispersed in the abundant waterways, as well as in the dry season, when the animals gather in great densities at the few pools available, we began to realize that there were very few mature adult caimans. The lack of adults means that few animals of reproductive age are left to continue the species; moreover, without parental protection, few of the juveniles will survive. It also implies a serious threat to the region's ecology. The waterholes excavated by caimans are often the only source of food available not only for the caimans but also for passing birds and mammals.

Furthermore, Elizabeth Odierna, then a student at Manhattan College in the Bronx, found that some of the caiman tissues were contaminated with dangerous levels of lead. This discovery came as a complete surprise: her true goal had been to check for mercury, used in many areas of caiman habitats to extract gold ore. Brazilian biologists had earlier discovered high levels of mercury in virtually all species of fish eaten by caimans and humans throughout the Amazon; our field tests confirmed the contamination of caiman habitats by mercury. Although the effect of mercury and lead on caimans is not known, one can only presume that the metals are as detrimental to these creatures as to humans.

Unsustainable Utilization

The watchwords for many crocodylian biologists today are “sustainable utilization,” defined as use of the species so that it maintains an economic value to the local human population and is therefore preserved. This philosophy is being applied to hardwood trees, elephants (for their ivory),



DON ASHBY/Sigma

FASHION INDUSTRY promotes crocodylian skins in cycles of about four years, increasing the pressures on wild populations of caimans.

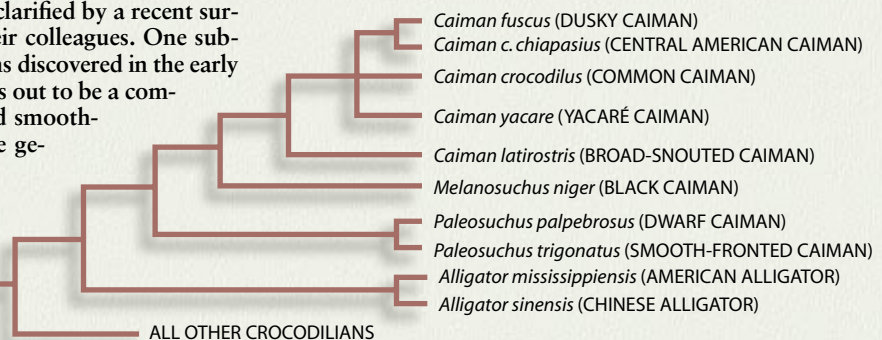
whales (for meat)—to just about every endangered or threatened species. Almost the entire conservation effort for crocodylians is directed toward using them for luxury leather products and meat.

Currently investors and ranchers in South America are spearheading a movement to build caiman farms and ranches to allow legal exportation of skins. Farming involves taking live adults from the wild and keeping and breeding them in captivity. Some of the offspring are used for leather and meat, and the rest are raised into breeding adults. If properly run, a farm should be a closed system, with no importation of animals beyond the initial batch. In ranching, eggs are collected from wild nests and incubated, or hatchlings are taken from the wild. The young are raised until the skins would be about a meter in length, when they are harvested. The resource for a ranch is the wild; hence, the argument goes, ranching creates an incentive to preserve caiman habitats.

Reality is tragically distant from theory. According to trade consultant Ashley, Brazil already has 75 registered ranches. Whereas some farms and ranches are intensively managed and have pens and buildings housing the caimans, in some places a “farm” or “ranch” may be a wild area that is fenced in by a private owner. The caimans unfortunate enough to live there then become available for commerce. Sometimes adults are collected from already depleted wild populations to form the basis of a commercial operation. Where wild animals are accessible just across the fence, an improperly run farm or ranch can become a laundromat for illegally captured wild animals.

There is circumstantial evidence that some farmed animals are actually wild ones. Brazaitis recently examined shipments of caiman skin with documentation indicating their source to be Colombian farms. The skins, up to 1.6 meters in length—and obviously originating from much longer animals—had an interesting abnormality. The tips of the tails had been lost and regenerated in about a quarter of the animals. In the

FAMILY TREE of caimans is being clarified by a recent survey in Brazil by the authors and their colleagues. One subspecies described from skulls and skins discovered in the early 1950s, *Caiman c. apaporiensis*, turns out to be a common caiman. The dwarf caiman and smooth-fronted caiman belong to a separate genus within the family of caimans.



BRYAN CHRISTIE

wild, as many as 50 percent of young caimans may lose the ends of their tails to predators. But this rarely occurs on a farm, whose objective is to produce unblemished skins. Furthermore, farmed or ranched animals are usually harvested well before they reach even 1.5 meters in length.

Many conservationists see commercial farming and ranching of crocodilians as providing cash that will somehow be redirected into conservation. But they seem to believe countries with poor histories of enforcing wildlife laws will become completely law-abiding overnight. Investors are expected to provide food, medicine and care to a hatchling for about three years until it reaches market size and then to make a profit by selling it for only \$50 or less. Ted Joanen, formerly with the Rockefeller Wildlife Refuge in Louisiana, points out that even in South America's impoverished economy such expectations are unrealistic. Moreover, the bulk of the revenue from the sale of skins does not make its way into enforcing wildlife laws or preserving habitat and wild populations. Rather it goes into investment profits, operating budgets or general government funds.

Once a prohibited species is put into trade, it instantly generates a new market. Without sufficient international controls and the ability to separate what is legal from what is not, the legalization serves simply to sanitize what remains largely an illegal trade. The critically endangered black caiman, ranched in Ecuador, is most likely soon to be allowed in international trade. But controlling the movement of illegal black caiman skins from cheap wild sources to products is simply impossible. The animals have relatively slow reproductive cycles, are easy to kill and require very specific habitats; once extirpated, they rarely return. As a result, even Ashley is concerned that when the trade begins, wild populations of the species will need to be closely monitored. Yet no program for monitoring wild populations is in place.

When a country decides to invest in sustainable utilization, the wild animals become tagged as resources. Typically all the available funding goes toward technology for farming, often with no effort being made to preserve the habitat. The animals of commercial value are selectively preserved as cash cows—not as biological functionaries in an ecosystem. Nowhere is this better seen than in China, which started farming the Chinese alligator in 1979. Although the farming operation is now successful, the wild alligator is vanishing; fewer than 1,000 animals remain in the wild. Nor can the wild population be regenerated from the farmed one; there is no natural habitat left to which to return the animals.

In principle, a farm can serve to breed a critically endangered species that is then returned to the wild. This has occurred in India, where saltwater and mugger crocodiles as

well as gharials have been restocked by the Indian government and the Madras Crocodile Bank. It should be noted, however, that India legally protects wild populations and wildlife refuges and does not allow trade in crocodilians, so there is less incentive for the wild animals to be killed.

A Question of Science

Scientific research into crocodilian biology is heavily supported by the farming, ranching and leather industries. Nearly all the major funders of the Crocodile Specialist Group that advises IUCN—which in turn makes recommendations to CITES and individual governments—are members of the trade. With so many scientists dependent on the industry's support, species conservation is in danger of getting short shrift when pitted against sustainable utilization.

Industry consultants hold that increasing the trade of the species will increase the incentive to protect the species. Based on such reasoning, CITES has assigned an export quota of 600,000 caiman skins a year to Colombia, a nation that actually produces up to 450,000 (mainly *C. fuscus*) a year. The rationale is that Colombia will soon be able to increase its caiman exports by means of farming and ranching.

In 1973, when the Endangered Species Act was signed, the U.S. Fish and Wildlife Service classified the Yacaré caiman as endangered and forbidden in U.S. trade. Significant amounts of data on the species' abundance were not available, and as a result the crocodilian leather industry has made numerous efforts since the mid-1980s to have the Yacaré declassified. When its initial efforts failed, the leather industry sponsored a study that divided Yacaré into three subspecies based on tannery skins of unknown origins. It then argued that these so-called subspecies should be traded, an argument to which the U.S. Fish and Wildlife Service fortunately did not subscribe. (But CITES manuals currently list all three Yacaré subspecies, without offering effective means for law-enforcement officials to distinguish among them.) Data from our survey prove that these multiple races of Yacaré are entirely without foundation. Efforts to downlist the Yacaré continue, even though their wild populations (and those of all other species of caimans) are reported to be declining in all their ranges.

As pressure to open trade in all crocodilian species increases, there continues to be no way to tell whether a piece of skin was from a legally farmed or ranched animal or from a "protected" wild creature that was hit on the head while basking on the edge of its pool. Aside from animals kept on commercial farms and ranches, South and Central America's wild caimans may well be on their way to becoming a true relic—the side of a purse displayed in a museum. SA

The Authors

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Further Reading

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