

the fish trapped inside. According to the fishers, the meat loses its capacity to attract piracatingas quite fast. They believe that the fish prefers the fatty tissues, and after this part is consumed, the remainder is thrown away, and the fishing continues with a fresh piece of meat or another carcass.

Four black caimans (*Melanosuchus niger*) and one spectacled caiman (*Caiman crocodilus*) were used during a fishing period that was followed from the beginning to the end. The largest caiman, an *M. niger*, was about 2.5 m total length. The other four animals were between 1 and 1.5 m long. The fishermen estimated that these caimans together weighed 100 kg, and the fishery yielded approximately 100 kg of piracatinga. Another fisherman said that a 3.5 to 4 m black caiman (approximately 300 kg) would yield 300 kg of piracatinga. Therefore, we can roughly assume that 1 kg of caiman yields 1 kg of piracatinga.

In the nearby town of Alvarães, formerly a trading center for illegal caiman meat, a kilogram of eviscerated piracatinga is sold by the fishermen to their patrons for R\$ 0.60-0.70 per kg (or US\$ 0.17-0.20 per kg). In this same place, a kilogram of salted/dried caiman meat was sold at US\$ 0.70-0.90 during the 1990s. Considering that *M. niger* is the most abundant caiman species in this region (Da Silveira 2002), we presume that this is the predominant caiman species used as bait in the area. The meat of the river dolphin *Inia geoffrensis*, a flagship species and probably a keystone species for the várzea floodplain ecosystem, is also being used in the same way, according to statements by Mr. Carvalho and Dom Alcimar.

A clue to the magnitude of this illegal and wasteful use of a noble species comes from one of the IBAMA's projects: ProVárzea. In Tabatinga, from May to December 2001, 140 tons of piracatinga were recorded by a monitoring system that belongs to a network of towns along the Amazon being monitored for fishery landings (see http://www.ibama.gov.br/provarzea/dbDownloads/visualiza.php?id_arq=14). If one kilogram of caiman yields one kilogram of piracatinga as we estimated earlier, some 140 tons of bait were used in this fishery.

A centimeter of *M. niger* skin can reach a value of several dollars on the international market, but is being simply wasted. The solution

is management and sustainable use. A program aimed at the sustainable use of fishery resources under way for the past five years in the Mamirauá Reserve resulted in an increase of 400% in the stock of the pirarucu *Arapaima gigas* (the most important fish species for local communities and also considered threatened) and doubled the buying power of local villagers (Viana et al., in press). The potential for caiman use is much greater. Meanwhile, however, the resources for research, conservation, management and monitoring of crocodylians in the Amazon are diminishing.

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French Guiana

POSSIBLE EXTENSION OF THE DISTRIBUTIONAL AREA OF BLACK CAIMAN IN FRENCH GUIANA. In French Guiana, black caimans are considered to be located primarily in the Kaw swamps, protected as a natural reserve since 1998 (Figure 1). In the past the species also was reported on the Mahury and Oyak Rivers in the west, and on the Kourouai and Ouanary River in the east (Plotkin et al. 1983; Medem 1983), but recent surveys revealed extirpation of the species in those areas due to past hunting pressures (Behra 1994; de Thoisy, pers. obs.). Only anecdotal sightings sometimes are reported.

An ongoing genetic study indicates a high diversity of the Kaw population of black caiman, and also suggests that breeders may be present outside the Kaw area (de Thoisy et al. 2002). Indeed, the use of microsatellite DNA revealed the existence of two metapopulations: one composed of caimans from the Kaw area and the second with animals sampled in the nesting sites of Mantouni and Aipoto Islands, in the Approuague estuary. Breeders nesting in these sites may not be those nesting in the Kaw area. Between the Approuague River and Oyapock River (Brazilian boundary), the Pointe Behague is a large (approx. 100 km²) and unexplored flooded savanna that is not accessible



Figure 1. Kaw Swamps Natural Reserve, French Guiana. A. Puthon map.

by land or water. A helicopter survey was conducted there in December 2002. The entire area seems to be a favorable habitat for black caimans, as it is quite similar to the Kaw swamps. Numerous black caimans (approx. 25 individuals, with a mean estimated total length of over 2.5 m) were sighted in two small ponds (< 1 ha). The survey was conducted at the end of the dry season, and no other open water area was located.

The survey was relatively short, and the entire site deserves more extensive work. Nevertheless, we may conclude that: (i) *Melanosuchus niger* distributional area in French Guiana may be twice as large as previously thought; (ii) the extension towards the west may suggest that the French Guianan population could be connected with that of Cabo Orange, Amapá, Brazil. A regional study and conservation program should be undertaken; genetic tools such as microsatellite DNA may help to assess populations structuration and/or cross-breedings; (iii) to date, the Pointe Béhague region is not legally protected. The passive protection is not fully adequate, and the newly assessed conservation value of this area may require the implementation of an active protection status.

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Venezuela

EVALUATION OF OCCUPIED AND POTENTIAL HABITATS OF THE AMERICAN CROCODILE (*CROCODYLUS ACUTUS*) IN VENEZUELA. Between October and November of 2002, a team of scientists from the School of Science, Central University of Venezuela (UCV) and the General Directorate of Wildlife, Ministry of Environment and Natural Resources (MARN) evaluated the current and potential habitat of the American crocodile (*Crocodylus acutus*). The goal was to propose areas for the liberation and reintroduction of the species in Venezuela. Inside the historical distribution area of the crocodile, a total of 23 locations were visited. For habitat evaluation, two matrices were defined: one with favorable factors and another with negative factors. The favorable factors that allow the establishment of stable populations of the species were identified as the following: presence of mangrove or forest vegetation; presence of sandy beaches for potential nesting; affluence or predominance of fresh water; legal decisions favoring the protection of habitats; and presence of the species. Negative factors identified include: presence of tourist activity; presence of dwellings; agricultural activity; industrial activity; sailing; fisheries; and proximity to roads. The presence of the evaluated factors in each location meant a positive and a negative value for each matrix; its difference was calculated in order to obtain a final value. The locations with high values were identified as the most favorable for releasing and/or reintroduction of the crocodiles.

According to this evaluation, the coastal/marine areas that proved most favorable for release and reintroduction were Turiamo Bay, Gulf of Cuare, and Olivitos Marsh. The most favorable natural freshwater environments were the Tocuyo and Tucurere Rivers, while suitable artificial environments were the reservoirs of Játira,