

CAIMANS, CAPYBARAS, OTTERS, MANATEES, AND MAN IN AMAZONIA

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ABSTRACT

Amazonia, the world's largest tropical rain forest, is often assumed to be a virtually untouched wilderness. The region is often referred to as a demographic void; there is on average only about one person per sq. km. Yet in response to international market forces, the hand of man has penetrated deep into the imposing forests. Since colonial times, wildlife, particularly along rivers, has been exploited on a large-scale basis for commercial purposes. This paper focuses on the effects of the trade on some aquatic animals.

INTRODUCTION

Amazonia, with its 7 million square kilometres of rain forest, is traversed by numerous rivers and streams which harbour a rich variety of aquatic wildlife. The great diversity of animals provides sustenance and a livelihood for many of the inhabitants of the sparsely settled region, estimated at around 6 million. The huge area of the Amazon basin, coupled with its low human population density, may give the impression that the region is largely pristine wilderness, a demographic void untouched by man.

Whereas large areas of relatively undisturbed upland forest remain, man has settled primarily along water courses and consequently the aquatic fauna has been particularly affected by human activities. This paper focuses on the utilisation of caimans, otters, capybaras and manatees.

In an effort to stem the slaughter of wildlife for the skin trade, the Brazilian government outlawed the commercial exploitation of wild animals in 1967 (*Decreto lei 5.197*). In spite of such measures, the killing of wild animals for non-subsistence reasons continued virtually unabated. Dealers presented the

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government with statistics suggesting that they had huge inventories that they should be allowed to liquidate. Bowing to pressure, IBDF (*Instituto Brasileiro de Desenvolvimento Florestal*) relaxed government regulations and until 1971 permitted the dealers to clear their stocks acquired prior to 1967. By employing grossly exaggerated inventories, the dealers kept on buying skins in large numbers (Doughty & Myers, 1971; Smith, 1976, 1978). The considerable political influence of the dealers, often businessmen involved in the lumber or Brazil nut industries, was obvious when they won another concession from IBDF and were once again permitted to export stocks during the first half of 1974. It is most unlikely that such stocks accumulated before 1967.

Statistics on the exports of wild animal skins from Amazonia are often unreliable, conflicting and difficult to find. Many skins are smuggled out, and others bypass statistical gathering, since dealers have a vested interest in reporting fewer skins than they are actually exporting in order to avoid duties. Since the prohibition of the trade in wild animal skins in Brazil in 1967, and Colombia and Peru in 1973, official statistics are no longer available. Thus, the statistics used in this report provide only a rough idea of the dimensions of the trade.

CAIMANS

Only two caimans are involved in the skin trade in Amazonia, although at least four species occur there. The largest is the black caiman *Melanosuchus niger*, which can reach 5 m long, and has the most valuable hide. Between 1962 and 1969, at least 53 433 black caiman skins were exported from Peru, originating from specimens killed in the Amazon region (Table 1). Iquitos on the Ucayali River has been the major exporting town for the Peruvian Amazon. A total of 101 641 hides of the spectacled caiman *Caiman crocodilus*, which can reach 2.6m, were exported between 1962 and 1967 from Peru (Table 2). Caiman hides under 1.2m may still be exported from Peru and the status of caimans in that country warrants study.

TABLE 1
EXPORTS OF BLACK CAIMAN *MELANOSUCHUS NIGER* HIDES FROM THE PERUVIAN AMAZON.
1962-1969

Year	Hides
1962	16 206
1963	10 845
1964	8 255
1965	4 000
1966	4 947
1967	3 363
1968	3 171
1969	2 646
Total	53 433

Source: Dourojeanni (1974).

TABLE 2
EXPORTS OF SPECTACLED CAIMAN *CAIMAN CROCODILUS* HIDES FROM THE PERUVIAN AMAZON 1962-1967

Year	Hides
1962	32 460
1963	28 341
1964	15 540
1965	9 775
1966	9 461
1967	6 064
Total	101 641

Source: Dourojeanni (1974).

Since 1973, Colombia has prohibited the export of caiman skins under 1.5 m, but the measure has done little to control the trade. For example, of the 556 422 *C. crocodilus* exported from that country in 1974, fully 84% were under the minimum legal length (Donadio, 1975). Leticia, on the Colombian Amazon, is a major outlet for hides in the region. Many of the skins come from specimens killed in Peru and Brazil which are easily smuggled across the border since inspections are virtually non-existent and bribes can quickly resolve bureaucratic snags. Unconfirmed reports indicate that as many as 400 000 caiman skins were smuggled from Brazil to Leticia in 1978 and then exported to West Germany (*A Noticia*, Manaus, 25.1.79).

In the Brazilian Amazon, the slaughter of caimans has been intense. Between 1960 and 1969, at least 1.5 million skins of *C. crocodilus* and *M. niger* were exported from the region (Table 3). These figures do not include the state of Mato Grosso; most of the caiman skins exported from Brazil come from the marshy Pantanal area in the headwaters of the Paraguay River. During the same 10-year period, at least 4.5 million caiman skins were exported from Brazil. Caiman hunting was even more intense in the preceding decade. From 1950 to 1965, a total of 7 517 196 caiman skins were legally exported from the state of Amazonas alone (Table 4). The slaughter continues; in early 1979, 12 000 caiman skins were confiscated by IBDF on the Rio Branco in northern Brazil (*A Critica*, Manaus, 7.2.79).

Although caiman skins are still being illegally exported, mostly to Europe where they are fashioned into handbags, wallets, belts and shoes, legislation has apparently slowed the flow of skins. *C. crocodilus*, known as *jacaré-tinga* in Brazil,

TABLE 3
EXPORTS OF CAIMAN HIDES FROM THE
BRAZILIAN AMAZON, 1960-1969

Year	Hides
1960	66 677
1961	83 887
1962	106 909
1963	101 277
1964	101 932
1965	112 909
1966	172 704
1967	490 089
1968	145 229
1969	143 635
Total	1 525 248

Source: Instituto Brasileiro de Geografia e Estatística, *Anuário Estatístico do Brasil*, (1963, 1965, 1967, 1970).

TABLE 4
CAIMAN HIDES FROM AMAZONAS STATE,
BRAZIL, 1950-1965

Year	Hides
1950	4 926 908
1951	262 020
1952	362 051
1953	430 774
1954	407 341
1955	—
1956	1 039 923
1957	13 884
1958	6 450
1959	1 773
1960	490
1961	600
1962	1 983
1963	327
1964	29 014
1965	33 658
Total	7 517 196

Source: Carvalho (1967)

are caught fairly frequently in gillnets placed in floodplain lakes of the Amazon River, and even near Manaus, with 500 000 inhabitants, small specimens can readily be seen, to the delight of tourists. The spectacled caiman can also be observed without much difficulty along tributaries of the Amazon, such as the Negro and Tocantins rivers.

Even the highly-prized *M. niger* is making a come-back. I saw a 4 m specimen in an Amazon lake near Itacoatiara, Brazil, in 1977. A fisherman called it by imitating its loud, deep belch, and by slapping a gourd in the water. The black caiman came within 10 m of us, behaviour that would have been considered most unusual in the 1960's or early 1970's. While there are still buyers for caiman skins, the prices paid to hunters are not as high as they used to be. The buyers justify the lower price paid to hunters by pointing to the risks involved in dealing with contraband. Peasants can make more money fishing the muddy Amazon.

The large-scale killing of caimans may have disrupted fisheries in clear and black water rivers and lakes. In such waters, nutrients are scarce, and caimans play an important role in recycling nutrients and increasing primary production by fertilizing the water with their faeces (Fittkau, 1970).

Apart from hides, caimans have also served the inhabitants of Amazonia in several other ways. In the first part of this century, the fat was mixed with scents as a fixing agent in the perfume industry. At Tefé on the Brazilian Amazon, caiman fat was boiled down and the resulting oil mixed with kerosene in the ratio of 7:3 for lighting (Pereira, 1944a). A tin of caiman oil cost about a third that of kerosene. Caiman fat was rubbed on the skin to help heal wounds and rashes.

Caiman meat is still much appreciated throughout Amazonia. In the 1940's specimens of *C. crocodilus* and small *M. niger* were butchered in the markets of Belém (Pereira, 1944a), and as recently as 1970, caiman steaks could be ordered in restaurants of the same city. Hunters work at night with flashlights and shotguns, such as along the Transamazon highway, where smooth-fronted caimans *Paleosuchus trigonatus* are occasionally shot for food (Fig. 1). The tail is the most relished part of a caiman; the white meat is similar to that of fish. Smooth-fronted caimans, which can reach up to 2.1 m (Wayne King & Brazaitis, 1971), provoke the ire of settlers along the Transamazon by snatching piglets along stream banks.

It is difficult to assess the status of caimans in the Amazon region due to the paucity of surveys. Although it is unlikely that any species are in any immediate danger of extinction, it would be unwise once again to permit caiman skin exports. The Peruvian and Colombian governments should prohibit the export of any caiman skins, since the minimum legal size is not respected.

Efforts could be directed to raising caimans in captivity, both for their hides and flesh. One possibility would be to domesticate capybaras and caimans and feed carcasses of the former to the caimans, after having removed the valuable skin first. Capybaras could be fed cheaply on the prolific aquatic vegetation of the Amazon floodplain.



Fig. 1. Skinning a smooth-fronted caiman *Paleosuchus trigonatus* along the Transamazon highway, Para, Brazil.

CAPYBARAS

Capybaras *Hydrochoerus hydrochaeris*, the world's largest rodent weighing up to 45 kg, have also figured prominently in the skin trade. Most of the capybara skins exported from Brazil originate in the swampy Pantanal district of Mato Grosso. Approximately 1.5 million skins were exported from Brazil between 1960 and 1969; nearly half a million of those came from the Amazon region (Table 5). Exports from the Brazilian Amazon were greater in the 1950's. From Amazonas state alone, a total of 476 749 capybara hides were officially exported from 1950 to 1954 (Carvalho, 1967). The trade in capybara skins in the Peruvian Amazon appears to have been more modest, with a total of 34 447 exported between 1966 and 1972 (Table 6). Most of the skins are made into gloves.

Capybaras live along large streams and rivers throughout Amazonia, but nutrient-rich, muddy rivers are the preferred habitat due to the abundance of

TABLE 5

EXPORTS OF CAPYBARA *HYDROCHOERUS HYDROCHAERIS* HIDES FROM THE BRAZILIAN AMAZON, 1960-1969

Year	Hides
1960	24 940
1961	44 082
1962	165 925
1963	100 440
1964	31 004
1965	33 597
1966	32 777
1967	31 916
1968	14 854
1969	17 788
Total	497 323

Source: Instituto Brasileiro de Geografia e Estatística, *Anuário Estatístico do Brasil* (1963, 1965, 1967, 1970).

TABLE 6

EXPORTS OF CAPYBARA *HYDROCHOERUS HYDROCHAERIS* HIDES FROM THE PERUVIAN AMAZON, 1966-1972

Year	Hides	Value U.S.\$
1966	7 822	8 674
1967	6 480	10 276
1968	2 394	2 747
1969	5 262	8 081
1970	4 800	9 600
1971	2 300	6 900
1972	5 389	10 778
Total	34 447	57 056

Source: Prado (1973).

aquatic grasses, and the extensive meadows at low water (Fig. 2). Capybaras are mostly killed at night employing flashlights and shotguns. The hunter paddles quietly up to the mesmerised creature and shoots it at close range. Gig fishermen sometimes catch the semi-aquatic rodents by lancing them with tridents. Although illegal, succulent capybara meat is frequently sold in most Amazonian towns. In Brazil, the price varies from US\$0.35 to US\$1.00 per kg, a third of the price of beef. In spite of its savoury flavour, the middle and upper classes shun capybara, considering it an undesirable game animal.

Capybaras are not in any danger of extinction and slaughter for the skin trade has declined, at least in the Brazilian Amazon. Habitat disturbance by man, especially forest clearing for agriculture and cattle raising on floodplains, has



Fig. 2. A capybara *Hydrochoerus hydrochaeris* grazing, Amazonia, Brazil.

increased the forage for capybaras. The rodents occasionally raid fields and eat bananas, sweet potatoes, manioc leaves and maize. The fact that a capybara can produce as many as 5 young per year, which only take two years to reach maturity, also accounts for the survival of the rodent in close proximity to man.

OTTERS

Otters have not fared so well in the presence of man. There are at least two species in Amazonia, the giant otter *Pteronura brasiliensis*, which can attain 2 m total length, and the smaller river otter *Lutra* sp., about which there seems to be some taxonomic confusion. Both have been avidly hunted for their soft, velvety pelts, which, in the case of the giant otter, can fetch a hunter the equivalent of US \$50, as much as he could expect to make clearing forest for 10 arduous days. By the time the pelt reaches Europe or the United States it is worth about five times as much as the hunter receives (Dourojeanni, 1974). Although much of the profit is pocketed by middlemen, the incentives for peasants to hunt otters are still very attractive considering the meagre wages paid to unskilled workers in the region.

Almost 20 000 giant otter skins were officially exported from the Brazilian Amazon between 1960 and 1969 (Table 7). The Peruvian Amazon, with a smaller area, exported almost 23 980 skins of the same species between 1946 and 1973 (Table 8). The Brazilian state of Amazonas alone produced at least 7510 giant otter skins between 1950 and 1965 (Carvalho, 1967).

The river otter has been especially hunted in the Peruvian Amazon. At least 113 718 were killed there between 1959 and 1972 (Table 9). The Brazilian trade appears to have been more modest, with only 3710 *Lutra* sp. pelts officially exported from the state of Amazonas between 1950 and 1965.

TABLE 7
EXPORTS OF GIANT OTTER *PTERONURA*
BRASILIENSIS SKINS FROM THE BRAZILIAN
AMAZON

Year	Skins
1960	1 655
1961	1 594
1962	1 778
1963	2 404
1964	2 015
1965	2 401
1966	1 217
1967	1 700
1968	2 250
1969	2 911
Total	19 925

Source: Instituto Brasileiro de Geografia e Estatística, *Anuário Estatístico do Brasil* (1963, 1965, 1967, 1970).

TABLE 8
EXPORTS OF GIANT OTTER *PTERONURA*
BRASILIENSIS SKINS FROM THE PERUVIAN
AMAZON, 1946-1973

Year	Hides
1946	2 017
1947	1 248
1948	751
1949	1 403
1950	1 437
1951	1 635
1952	854
1953	918
1954	1 213
1955	2 169
1956	1 766
1957	1 066
1958	1 278
1959	1 114
1960	1 002
1961	293
1962	850
1963	435
1964	672
1965	223
1966	213
1967	138
1968	102
1969	47
1970	306
1971	12
1972	—
1973	818
Total	23 980

Source: Prado (1973); Egg (1978).

Otters, particularly the giant otter, appear to be threatened throughout most of their extensive ranges. The giant otter is noisy and even curious in remote areas, which makes it especially vulnerable to hunters. The public image of otters is unfortunately not very favourable in Brazil. Fishermen regard them as competitors. In November 1978, an Air Force man died as a result of bites inflicted by giant otters when he rescued a boy who had fallen into the pen at the Brasília zoo.

MANATEES

Two species of manatees occur, or at least occurred, in Amazonia. The Caribbean manatee *Trichechus manatus* once lived along the Brazilian coast as far south as the state of Espírito Santo. However, its status is uncertain, and it may now be extinct from the coast of Brazil. The smaller *Trichechus inunguis*, which can attain 400 kg, lives in black, clear and muddy rivers below waterfalls and rapids in Amazonia. The numerous lakes of the Amazon floodplain are the optimum habitat

TABLE 9
EXPORTS OF OTTER *LUTRA INCARUM* SKINS
FROM THE PERUVIAN AMAZON, 1959-1972

Year	Hides
1959	4 842
1960	6 142
1961	11 349
1962	6 129
1963	7 762
1964	10 809
1965	8 862
1966	6 332
1967	6 414
1968	8 362
1969	8 763
1970	14 544
1971	6 712
1972	6 696
Total	113 718

Source: Prado, (1973); Dourojeanni (1974).

for manatees because the nutrient-rich water promotes the growth of floating islands of vegetation, upon which the herbivorous mammals feed.

T. inunguis has long served as an important food resource for inhabitants of the Amazon basin. In pre-contact times, they were hunted by aborigines, as evidenced by bones found in shell mounds 45 km east of Santarém (Hartt, 1885). In spite of millennia of hunting pressure by natives, manatees were still abundant in early colonial times, suggesting that there must have been cultural checks to over-exploitation. Orellana's expeditionary force down the Amazon in 1542 was well provided with 'beef-like' manatee meat by the numerous tribes (Medina, 1934). Manatees were still very common along the Amazon in the 17th century and were an important item in the regional diet (Acuña, 1891). Natives doused the 2-cm thick manatee hides with hot ashes to make stiff shields strong enough to resist arrows and even shot. The Tikuna tribe of the middle Amazon River used the shoulder blade of *T. inunguis* as a spatula in cooking (Nimuendaju, 1952).

In pre-contact times, Indians captured manatees using harpoons fitted with shell points. During the colonial period metal points were used, and a brisk trade in manatee products developed. The abundant fat, as much as 100 kg on a large specimen, was melted down to oil for lighting. In the 18th century, French brigantines sailed from Guiana to exchange trinkets, salt and beads in exchange for salted manatee meat and oil. The oil, considered as sweet as butter, and salted meat were much appreciated in Cayenne for preparing soups, fricassées and pastries (Barbot, 1744; Allen, 1942). In the Amazon region, the oil was also mixed with pitch to caulk boats (Ferreira, 1903).

During the 18th century, the Portuguese established Royal fisheries in the Amazon basin to process turtle eggs, fish and manatees into oil and meat for consumption by garrisons and locals. The Villa Franca fishery, near the present-day town of Santarém along the middle Amazon, alone produced 58 tons of meat and 1613 pots of oil from some 1500 manatees between 1776 and 1778 (Ferreria, 1903). The hides were made into whips.

Mixira is prepared by frying manatee meat in its own fat and then storing it in clay pots with the oil. The meat is thus preserved for several months and is still consumed in minor quantities in the Amazon. *Mixira* was an important trade item in the Amazon; a total of 209 748 kg entered the Belém market between 1876 and 1915 (LeCointe, 1922). Sausages were made from the stomach linings of manatees stuffed with chopped meat, vinegar, salt and pepper and were exported to Portugal (Spix & Martius, 1966).

In the 20th century, manatee hides were exported to southern Brazil, and to a lesser extent Portugal, where they were manufactured into machine belts, water hoses for locomotives and cords for cotton looms (Pereira, 1944b). The hides were also fashioned into loops for collecting cacao (LeCointe, 1922). One Manaus firm alone sent 6549 manatee hides, weighing an average 21 kg each, to Rio de Janeiro between 1938 and 1942.

Manatees have declined drastically since colonial times and are no longer an important item in the regional diet. For example, a hunter told me that he killed 190 manatees along the River Unini, an affluent of the Negro, between 1960 and 1964. But he killed only 50 along the same river between 1970 and 1972. At Barcelos on the Rio Negro, salted manatee meat could be found for sale in small quantities for US \$0.40/kg in 1972, and in Manaus for US \$0.50/kg in the same year. Manatee meat is now extremely rare in Manaus, even on the clandestine market, and was only very occasionally available in Itacoatiara on the Amazon river for US \$ 0.60/kg in 1977.

The generally low population density of manatees no longer justifies full-time hunting. They are still occasionally captured by fishermen after the giant pirarucú *Arapaima gigas* fish with harpoons. More rarely, manatees are scooped up in lampara seines.

The exact status of *T. inunguis* in Amazonia is not known, but it is safe to assume that it is threatened. Manatees have been greatly reduced throughout their extensive range, and are vulnerable to further decimation in low water years when they become more concentrated. Manatees have a very slow reproductive rate, no more than one calf every three years, and their habitat is attractive to settlement because of cheap water transportation and floodplain soils for agriculture. Furthermore, with greatly reduced numbers, suitable mates may be encountering difficulty finding each other in the vast water network of the basin. *T. inunguis* may be able to survive the increased tempo of settlement and development in the region due to its cryptic habits, and the fact that there is little profit exclusively hunting Amazonia's largest native mammal.

CONCLUSIONS

It is unrealistic to expect the developing nations of Amazonia to assume total responsibility for the destruction of wildlife in the basin. Much of the pressure to exploit the resource has come from outside, particularly the United States, Western Europe, and Japan. The area is too vast, and the manpower too small and ill-equipped to patrol effectively all border crossings, ports and airfields in the region. The importing countries should assume the major burden for the alarming decline in wildlife.

Fortunately, the United States prohibits the importation of endangered species without special permits. But these regulations can be bypassed by sending shipments to countries such as Bolivia or Guyana where legislation protecting wildlife is lax, and then re-exported. West Germany continues to import large quantities of wild animal pelts originating from Amazonia. A moratorium should be established by the importing countries until much more is known on the status of the exploited species in the wild.

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