

Continuing problems for Amazon river turtles

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Amazon river turtles have a long history of over-exploitation, firstly for oil production, and lately as a luxury food for the expanding human population. In many areas, the populations of the two main commercial species *Podocnemis expansa* and *P. unifilis* are now so low that extinction is in sight. In 1985 a WWF-US project aimed at investigating interactions between economic development and wildlife populations conducted a case-study of the exploitation of turtles on the River Tefé in western Brazilian Amazonia.

The small town of Tefé (population 30,000) lies close to the junction of the black-water River Tefé and the silt-laden white-water River Solimões (lower River Amazon). The British naturalist Henry Walter Bates, who lived in the town during the 1850s, remarked that turtle meat was eaten to such an extent that he was thoroughly sick of it (Bates, 1863). Even 20 years ago turtles nested commonly on the white-sand beaches of Tefé Lake. Boats from Tefé now have to make a journey several days from the town to be sure of a profitable catch, and the distance they travel increases every year. Nevertheless, hundreds of boats are prepared to make the trip.

The capture and sale of turtles is, of course, illegal. The collection of nesting females was prohibited as long ago as 1882. Such laws are ignored and largely unenforced. Tefé is a major centre of the clandestine turtle trade, supplying the ready market of Manaus and even sending animals to the urban centres of southern Brazil.

Target turtles

The giant South American river turtle *Podocnemis expansa* is the largest of the Amazonian river turtles, reaching a carapace length of 82 cm and a weight of 50 kg (Smith, 1979); an adult female yields up to 7 kg of meat. Females are locally referred to as 'tartarugas' and males as 'capitarís'.

Amazon river turtles

The yellow-spotted Amazon sideneck turtle *P. unifilis* is typically around 40 cm long and weighs about 8 kg, although gigantism has been reported. Females are called 'tracajás' and the diminutive males 'pregos'.

Generally, only the females of these two species are marketed commercially. The males and the smaller species that occur around Tefé (*P. erythrocephala* and *P. dumeriliana*) are eaten locally, but seldom exported.

Unlike the smaller species, tartarugas are colonial nesters. In the 18th and 19th centuries vast quantities of eggs were destroyed for oil production (Bates, 1863; Mittermeier, 1975; Smith, 1979). This no longer occurs, but eggs of all species are avidly sought and are something of a local delicacy (they are also believed to carry certain aphrodisiacal qualities).

Turtle economics

During the low-water season (July to October) the River Tefé seethes with activity. Anyone would think there had been a gold strike. Turtle-collecting is highly profitable.

Turtles have always been a favourite food amongst Amazonians. Most local residents agree that tracajás are 'the best', but the rarer tartarugas command the highest prices amongst city-

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dwellers 'who don't know any better'. Tartaruga barbeques are something of a status-imparting event amongst the upper and middle classes, often served to dignitaries and visiting politicians. Many wealthy people build special holding pools on their properties to keep animals alive during interim periods.

During the 1985 season, the average price of a tartaruga delivered in Tefé was US\$60 (ranging from \$40 to \$130 depending on size). Served in a Tefé restaurant (by arrangement) tartaruga cost \$13 to \$20 per portion. A tracajá delivered in Tefé would normally fetch \$11 to \$14, but might decline to as little as \$7 if a number of boats arrived simultaneously.

Turtle eggs, a minor trade by comparison, sold at the rate of ten for US34¢ at the beginning and ten for 13¢ at the peak of the season (a tartaruga lays around 90 and a tracajá around 30).

Prices in Manaus for both turtles and eggs were two to three times those at Tefé; in southern Brazil prices would be higher still.

A small open motor canoe with a petrol engine would expend \$25 in fuel travelling to and from current turtle exploitation areas. A larger diesel-engined riverboat travelling to the two or three tartaruga beaches, five days upriver, would expend perhaps \$100 in fuel. The minimum monthly salary for manual workers (set by the Brazilian government) is around \$45, but some people in Tefé are actually paid as little as \$5 a week and many have no regular income at all. Set

against the inflated prices that are readily paid for turtles, the eagerness of local people to disregard the law is understandable.

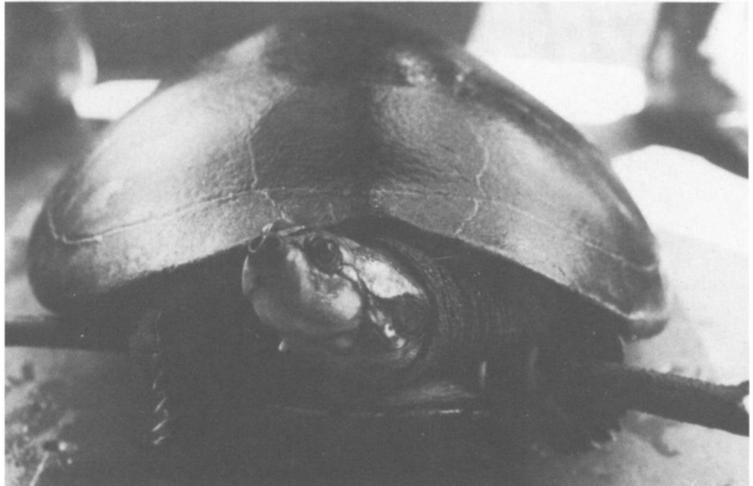
Exploitation levels

Local people estimate that around 300 adult tartarugas are sold in Tefé each year. This figure is lower than the actual exploitation level because some are transported direct to Manaus. Many tartarugas that change hands in Tefé are also exported. No figure can be given for tracajás since many are eaten on site by local people (they are the traditional fare at engagement parties, weddings etc.). However, several boats arrive in Tefé each day during the peak season, and a load of 30 tracajás and 1600 eggs would not be unusual.

The actual number of turtles in the River Tefé system is not known since a few undiscovered tartaruga beaches may exist in the upper reaches. It is unlikely that more than 3000 nest annually on known beaches. Tracajás are not colonial nesters and are still common in the upper reaches of the River Tefé. However, most beaches within two or three days' travel from Tefé are already exhausted. Residents from the Tefé Lake region complain of having to travel further upriver each year and having to spend as long as two weeks searching before collecting 'a boatload'. Clearly, tracajás will not be common anywhere before long.

A perturbing trend is the growing exploitation of juvenile turtles, particularly tartarugas. Two boats

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Left: Prego: these small turtles are eaten locally but usually not sold (A.D. Johns).

Right: Tartaruga trussed for transport to the market in Tefé (A.D. Johns).

observed on the Tefé River late in the nesting season had supplemented poor catches of adult animals with 50 and 70 'undersized' turtles respectively. Animals as small as 22 cm carapace length (1 kg in weight) were being eaten locally during the 1985 season (as recently as two or three years ago, turtles of this size would have been discarded). A search of Tefé rubbish tips at the end of the season indicated that over 90 per cent of the animals eaten were smaller than 35 cm carapace length (3.5 kg weight). This can only mean further decreases in the future numbers of nesting females.

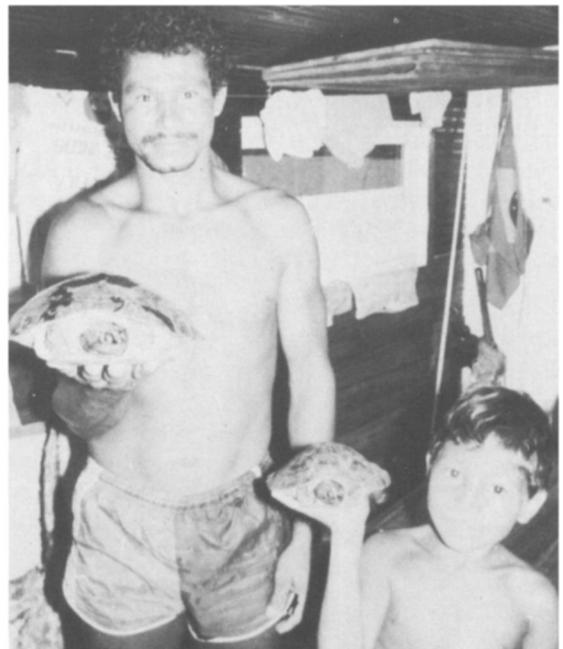
Strategies for conservation

The Brazilian Forestry Development Institute (IBDF) polices tartaruga nesting beaches on the Rivers Trombetas and Tapajós in eastern Amazonia and one on the River Curimatá, a west-bank tributary of the Tefé River. However, even the presence of guards does not always dissuade the turtle collectors. During the 1985 season, sufficient numbers of poachers arrived at a protected beach on the River Trombetas to be able to chase off the IBDF guards, rather than *vice versa* (J. Mortimer, pers. comm.). IBDF lacks the funds necessary to station large numbers of guards on each beach.

Even where poachers are kept off the beaches, the number of nesting female turtles is falling almost everywhere. Many are harpooned, netted or caught on trotlines as they make their way to nesting beaches. Solitary-nesting species are less

vulnerable, but are nevertheless declining in all but the most remote areas due to annual losses of large numbers of adult females and nests.

Subsistence hunting is a way of life in many parts of the Amazon basin and is impossible, perhaps undesirable, to prevent. However, commercial exploitation of turtles could, and should, be curtailed. Apart from rare visits by paramilitary Federal Police teams checking up on the cocaine



Undersized tartarugas en route to Tefé (A.D. Johns).

trade, waterborne transport is free from cargo checks. At several points within easy reach of Tefé, the River Tefé is less than 30 m wide, with no alternate channels. Authorized personnel stationed at such a point could both warn boats going upriver and search those coming down, making it difficult to smuggle turtles through. Since turtles are transported alive, any confiscated animals could simply be returned to the river. Governmental agencies concerned with wildlife protection, such as IBDF, are very short of funds and manpower, but this procedure would seem efficient.

It might be suggested that turtles should become the focus of a publicity campaign. This is unlikely to be successful because the decline of turtles is already a cause of great regret among local people who now have to work harder to collect them. The consequences of collecting undersized animals are appreciated and regretted, but the people insist that they 'have to collect them to make money'. There have even been attempts to get the trade legalized, despite the obvious consequences. So far, and commendably, these have been quashed, but with the return to democracy in Brazil such could become vote-winning issues.

It has been suggested (for example, Mittermeier, 1978) that turtles could be farmed, thus taking the pressure off wild populations. Whether or not the expertise exists to create turtle farms is a moot point; nor, since turtle growth rates are slow compared to more traditional domestic stock, is it at all clear whether farms would be commercially viable. As has been pointed out for crocodylians (Magnusson, 1984), there is generally no substitute for the commercial management of wild stocks. Unfortunately, despite a number of studies aimed at elucidating the status and possibilities for management of wild turtles (for example, Brazil, 1973), few concrete conservation measures have arisen. Current studies by IBDF and the Zoology Department of Museu Paraense Emílio Goeldi, Belém, may help in this respect.

Habitat loss

Not only are Amazonian turtles suffering vastly increased poaching, but their floodplain feeding grounds are being destroyed to make way for

agricultural schemes. While such developments are largely confined to eastern Amazonia at present, increasing human populations in hinterland areas are giving rise to more such schemes each year. Floodplains tend to be flat, more fertile and more accessible than *terra firme* habitats. There is also increasing interest in wood-pulping operations in seasonally flooded forests, and this may be expected to become a major threat to turtle populations in the future. Even if turtle nesting beaches are protected, populations are likely to become increasingly restricted to the remoter areas of Amazonia. The only solution would be the creation of protected areas of floodplain. This has already been recommended for the protection of commercial fish stocks (Goulding, 1983) but shows no sign of being implemented.

Amazon river turtles were once so abundant as to be likened to the grains of sand on a beach, but similes rather like this were also applied to passenger pigeons.

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