

Distribution and Status of the Forest Elephant in the Ivory Coast, West Africa

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Introduction

Among all terrestrial ecosystems the tropical rain-forest is the most heavily influenced by human activities. Severe changes caused by logging, agricultural use and agro-industrial projects lead to extensive destruction of this habitat and therefore to the loss of a source of tremendous biological and genetic diversity.

Based on present climatic conditions in Africa, about 66% of Central Africa, 19% of West Africa and 11% of East Africa could be covered with evergreen moist forests, summarized as rain-forest; the actual sizes of the rain-forest are 37%, 5% and 3% respectively.¹ About 4% of the total of existing forest area is declared as protected, but West Africa contributes less than its share with only about 2.8% of the forest legally secured.² Some 18 million hectares are covered with tropical lowland forest, semi-deciduous forest and mountain rain-forest; of these 4.6%, 4.9% and 0.1% respectively have a certain status of protection.³ Of this, National Parks amount to 3% of the evergreen forest formations and 4% of the semi-deciduous forest while the remainder is Wildlife Reserve or Forest Reserve.

The Guinea Forest Block, stretching along the coast from the 0° meridian to a longitude of 13° West and a latitude of 8° North, has been more intensely influenced by man than any other rain-forest region of the world. Official statistics verify a decline in the primary rain-forest of about 72% up to 1975. Those forests still in existence are subject to continual land-use reform. The consequence is a further decline in forested area and the creation of isolated forest patches. A great number of such islands are already too small to serve as real refuges for most animal species.

Fifty-one percent of the larger mammal species occurring in the Guinea Forest Region are so dependent upon the existence of the rain-forest that they will disappear if their habitat is irreversibly changed.⁴ In a broader sense the African Forest Elephant is numbered among them. Even if the elephant is easily able to adapt himself to certain modifications of the environment, his survival is nonetheless dependant upon the conservation of intact tropical forests.

Parallel to the decline of forest area, a transformation of intact habitats into ecologically valueless cultural land often takes place. The elephant reacts, but is unable to survive. The behaviour, distribution and number of elephants changes drastically.

Forest elephants - so-called round-eared elephants - once populated the whole West African and northwest African regions^{5,6} and until the end of the 19th century elephants could be found in all parts of the West African forest zone.⁷ In the Ivory Coast, where the rain-forest originally covered 157,00 km², or about half of the country, the forest elephant lived in large numbers.^{8,9} Depending upon the structure of the habitat and the availability of fodder plants, considerable differences in population densities occurred. The animals were not regularly

dispersed but concentrated in suitable locations while other areas were avoided.

The elephant area became smaller the more intensively man exploited the forest. In 1956 39,000 km², 25% of the forest, had already been destroyed. By 1974 tropical forests covered only 54,000 km²; 66% had disappeared. During the 1980s, clearing continued at a great rate until, by 1985, more than 90% of the forest had been obliterated; less than a tenth of the original resource remained. Now, the last intact primary rain forest is largely restricted to the Tai National Park which is near the border with Liberia and covers a mere 3,300 km².

While various general surveys of mammals in the Ivory Coast had been^{10,11,12,13,14} the first nation-wide elephant census was carried out in 1979 and 1980.¹⁵ The forest elephant estimated at 3,050 over an area of population was 29,420 km² of which 7,285 km² (25%) were National Parks or Wildlife Reserves, 14,080 km² (48%) had the status of a Forest Reserve and 8,053 km² (27%) were not legally protected.

In 1988 and 1989 a second census of forest elephants was organized in the Ivory Coast. This census was based mainly on surveys of statistically selected, different forest areas and enquiries made to local populations, agricultural societies and government agencies engaged in nature conservation such as Controle Forestier, Conservation de la Faune and Parcs Nationaux et Peche du Ministere des Eaux de la Peche et des Fôrets.

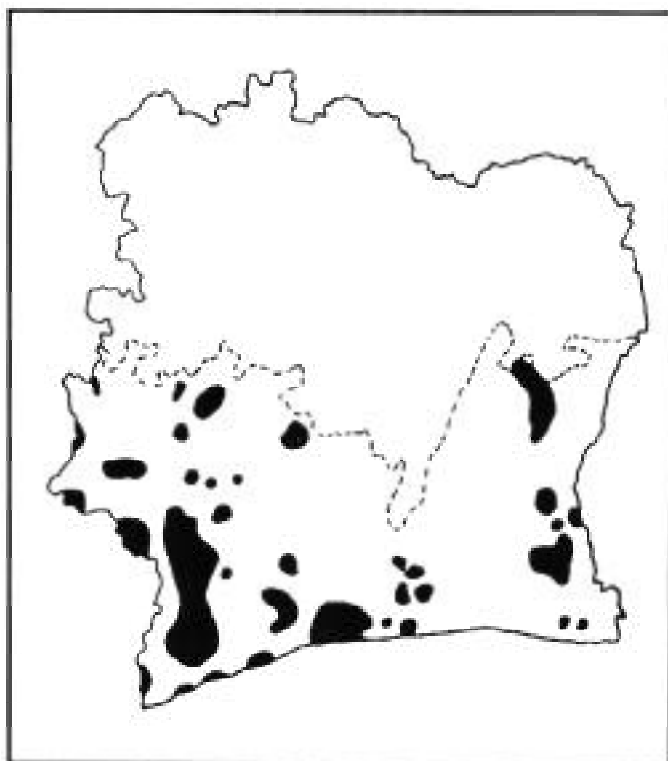


Figure 1. Distribution of the forest elephant in Côte d'Ivoire in 1980 (Roth et al., 1984)

Table. Distribution and density of forest elephants in the Côte d'Ivoire

No	Name of area	Date Founded	Initial area km ²	Forest area Km ² and %	Forest elephant Population	Forest Elephant Density
1	Keregbo		213	213 100	30	0.14
2	NP Marahoué		1,010	757 75	70	0.07
3	Haut Sassandra	1974	1,024	898 88	50	0.04
	Mont Tia	1974	163	138 85		
4	Duekoué	1976	536	413 87	15	0.03
5	NP Sangbe		950	900 95	30	0.03
6	NP Mont Peko		340	340 100	20	0.06
7	NP Tai	1972	3,400	3,400 100	800	0.11
	Zone de Protection	1977	660	462 70		
	WR N'Zo	1972	730	730 100		
	Hana		350	280 80		
	Rapide Grah		1,000	600 60		
	Haute Dodo	1973	1,094	845 77	70	0.04
8	Goin-Cavally	1978	560	522 93		
	Goin-Debe	1978	1,330	1,061 80		
9	Niegré	1975	1,056	692 69	50	0.05
10	Scio	1972	1,338	796 60	30	0.02
11	Tiapleu		380	228 60	10	0.03
12	Bolo		88	51 58	5	0.05
13	Davo		126	126 100	20	0.16
14	Okromodou	1973	945	432 46	50	0.05
15	Go-Bodienou	1978	600	217 36	20	0.03
16	NP Azagny		200	200 100	45	0.22
17	Songan	1952	310	258 83	150	0.09
	Tamin	1952	463	206 45		
	Mabi	1929	631	359 57		
	Yaja	1935	294	244 83		
18	Beki-Bossematie		389	233 60	30	0.07
19	Djambamakrou		274	164 60	30	0.07
20	Tene		4	4 100	5	1.25
Total			20,458	15,769	1,520	0.07

Results

The total population of forest elephants in the Ivory Coast summarized in the table is estimated at 1,520 animals split up

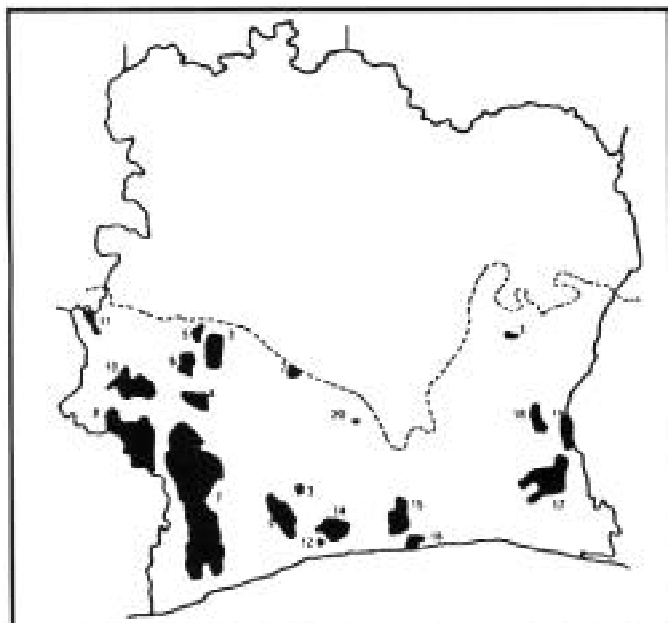


Figure 2. Map of Côte d'Ivoire showing areas referred to above

into 20 isolated sub-populations. These units consist of from five to 70 animals, except in the forest reserves of Songan, Tamin, Mabi and Yaja which contain an estimated 150 elephants, and the forest reserves of N'Zo, Hana, Rapide Grah and Haute Dodo with a total population of 800 individuals. In a personal comment, Boesch has said that the situation in the Tai National Park is very bad. A tremendous increase in poaching activities has reduced the number of elephants to about 100. This means a decline of 25% per year from the estimated population of 800 animals given by Merz in 1982.¹⁶ Ignoring the natural rate of increase, the total loss of elephants in the Tai National Park approaches 90% of the population.

Contacts between different sub-populations do not exist. The mean density is estimated at 0.07 elephants per km² 'fluctuating between 0.22 animals per km in the Azagny National Park and 0.02 per km² in the Scio Forest Reserve. In the Tene Forest Reserve, a small forest patch completely surrounded by forest plantations, a group of about five elephants has been able to survive until now, even at the very high density of 1.25 animals per km². In 11 areas where Roth *et al.* proved the existence of elephants, animals could no longer be found.¹⁷ The presence of elephants is largely concentrated on legally protected forest areas such as National Parks, Wildlife Reserves or Forest Reserves. But even such a status, resulting from de jure protection, is no guarantee for the survival and conservation of elephants.

Discussion

Over a period of nine years the habitat of the forest elephants in the Ivory Coast has been reduced by 40%. In the same time the number of forest elephants fell by 50%. Eleven elephant ranges have lost their entire elephant populations. A dramatic increase in human population has taken place, caused by a high birth-rate and a high immigration rate of allochthone ethnic groups. In the course of human expansion forest was increasingly cleared for settlements, pasturage, agriculture and logging. The consequence has been a decrease in wildlife habitats which, in turn, has caused various land-use conflicts between man and animal.

The elephant, as one of the most successful animals ever to have lived on earth, accepts certain alterations in habitat caused by some kinds of extensive logging. In the tropical rain-forest the elephant even seems to appreciate the secondary bush and forest vegetation which grows in clearings and supplies a rich variety of palatable fodder plants. If the changes allow a complete regeneration of vegetation the elephant is able to coexist with man. However, any transformation of the forest into ecologically dead areas excludes elephants. Such transformation is caused by a combination of selective logging and shifting cultivation, by agro-industrial plantations and by commercial hunting for meat or trophies. In nearly all elephant areas ivory poaching is the most serious hazard to the survival of the forest elephant. The deeper man penetrates into the last, closed forests the more illegal hunting for ivory with the aid of modern firearms and automatic pistols decimates the elephant population.

The annual death rate is estimated at 16%, comprising a natural mortality rate of 3% and a hunting rate of 13%.¹⁸ The annual increase in forest elephants is estimated at 4% to 6%,^{19,20,21} less than half of the animals killed in the same period. Thus, allowing for the birth rate, the decrease in forest elephants in the Ivory Coast is about 10 - 12% per annum.

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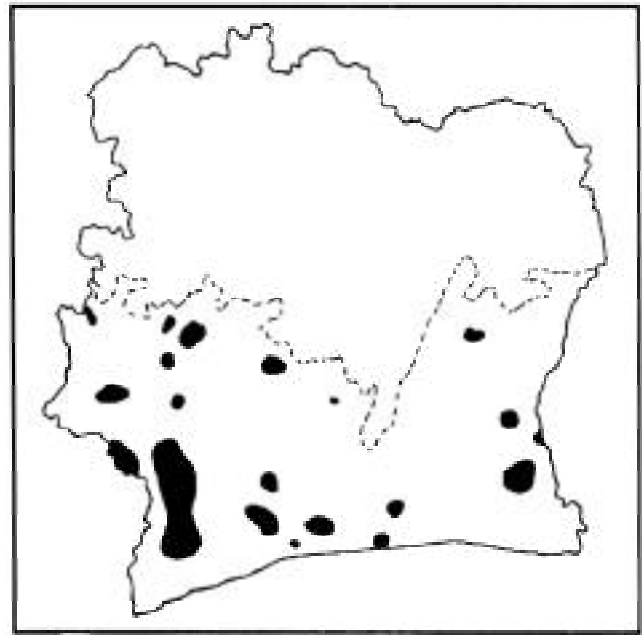


Figure 3. Distribution of the forest elephant in Côte d'Ivoire in 1989