

Funaioli U, Simonetta AM. 1966. The mammalian fauna of the Somali republic: Status and conservation problems. Italian Journal of Zoology 74 (Suppl.):285-95.

Keywords: 1SO/Acinonyx jubatus/cheetah/conservation/distribution/East Africa/fauna/habitat/mammal/map/occurrence/status/survey

Abstract: In this article about the mammalian fauna in the Somalia Republic, the authors affirm that the cheetah *Acinonyx jubatus velox* number have strongly decreased in these last years. Although the species has never been very common in the country, it has now disappeared from the more settled areas. It is now scarce even in its stronghold along the Kenya border. Some recommendations are proposed to protect the existing fauna.

Dans cet article sur la faune mammalienne de la République de Somalie, les auteurs affirment que les effectifs de guépard *Acinonyx jubatus velox* ont fortement diminué au cours de ces dernières années. Bien que l'espèce n'ait jamais été très commune dans le pays, elle a maintenant disparu des zones les plus anthropisées. Elle est aujourd'hui rare même dans les bastions le long de la frontière du Kenya. Une série de recommandations est proposée afin de protéger la faune existante.

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THE MAMMALIAN FAUNA OF THE SOMALI REPUBLIC: STATUS AND CONSERVATION PROBLEMS

(Ricerche sulla Fauna della Somalia promosse dall'Istituto di Zoologia
e dal Museo Zoologico dell'Università di Firenze: XXVII) (*)

(with 23 text figs.)

INTRODUCTION

The present report is, in some ways, a follow-up of our paper « Statut actuel des Ongules en Somalie » (FUNAIOLI & SIMONETTA, 1960); the Mammalian Fauna of Somalia is, indeed, among the less known of Africa both in its composition and in distribution, so that both mammalogists and the Somali and International Authorities concerned with the conservation and scientific exploitation of wildlife are greatly interested in obtaining information on the present status of the Mammals of Somalia and on possible future developments of the situation.

We have been asked by colleagues working at the Smithsonian African Project, as well as by F.A.O. Offices and by Officers of the Somali Government to make available the information we had gathered in these years of study of the Fauna of the Somali Republic and to give advice as to the more effective measures to take for its conservation.

Indeed, such a report, if it could combine the more relevant data on the whole Mammalian Fauna of the Republic (within its present political borders), with an objective evaluation of the present and possible future economic significance of wildlife for the People of Somalia, might prove of some use to the pure zoologists as well as to those involved in planning the economic development

(*) Lavoro eseguito col contributo del Consiglio Nazionale delle Ricerche.

of Somalia. It might also disoblige us a little of the assistance and hospitality which the People and the Government of the Somali Republic have offered to our expeditions.

Moreover, though our research plans have always been primarily aimed at pure research, in the present stage of social and economic development, it is mandatory that whenever in the course of research the scholar collects data which may be of practical use, he makes them promptly available to whoever may be concerned with their use.

EVIDENCE AND METHODS

Through these years most, if not all, of the published evidence on the mammals of Somaliland has been examined, direct observations have been made during our field work (1) (itineraries covered are mapped in Fig. 1) and dozens of Somalis and of Europeans have been questioned, thus adding a wealth of unpublished data. We have been also able to consult many manuscript documents in the archives of the Istituto Agronomico per l'Oltremare of Florence and in the Somali Government offices.

Therefore we have made use of all the available information to compile the distribution maps. In them we did not aim at pointing up individual, precise records as, owing to the nature of the sources of information, the maps would eventually have shown clusters of dots where the species discussed was possibly not at all common, but the area had been one visited by a number of people, while only sparse records would appear in the less visited areas, where, instead, the nature of evidence available shows that the animals are more or less evenly distributed and eventually abundant.

Indeed, in the former Italian trust territory there has never been an efficient game department to collect records in a systematic way and in the former British Somaliland the working of the game department has hardly been better. Ours is the first attempt to give both a comprehensive list of the mammalian taxa recorded from the territory of the Republic and to provide distribution maps of the game species based on really reliable evidence. This being the nature of this work, its faults will be easily understood and excused.

In order to give the reader who is unfamiliar with the territory and its problems a better understanding of the significance of the

(1) One of us (Funaioli) has worked as an official of the Somali Ministry of Agriculture from 1952 to 1957 and has been a member of the biological expedition of the Institute of Zoology of Florence in 1959. The other (Simonetta) has been a member of the 1959, 1962, and 1964 expeditions of this Institute.

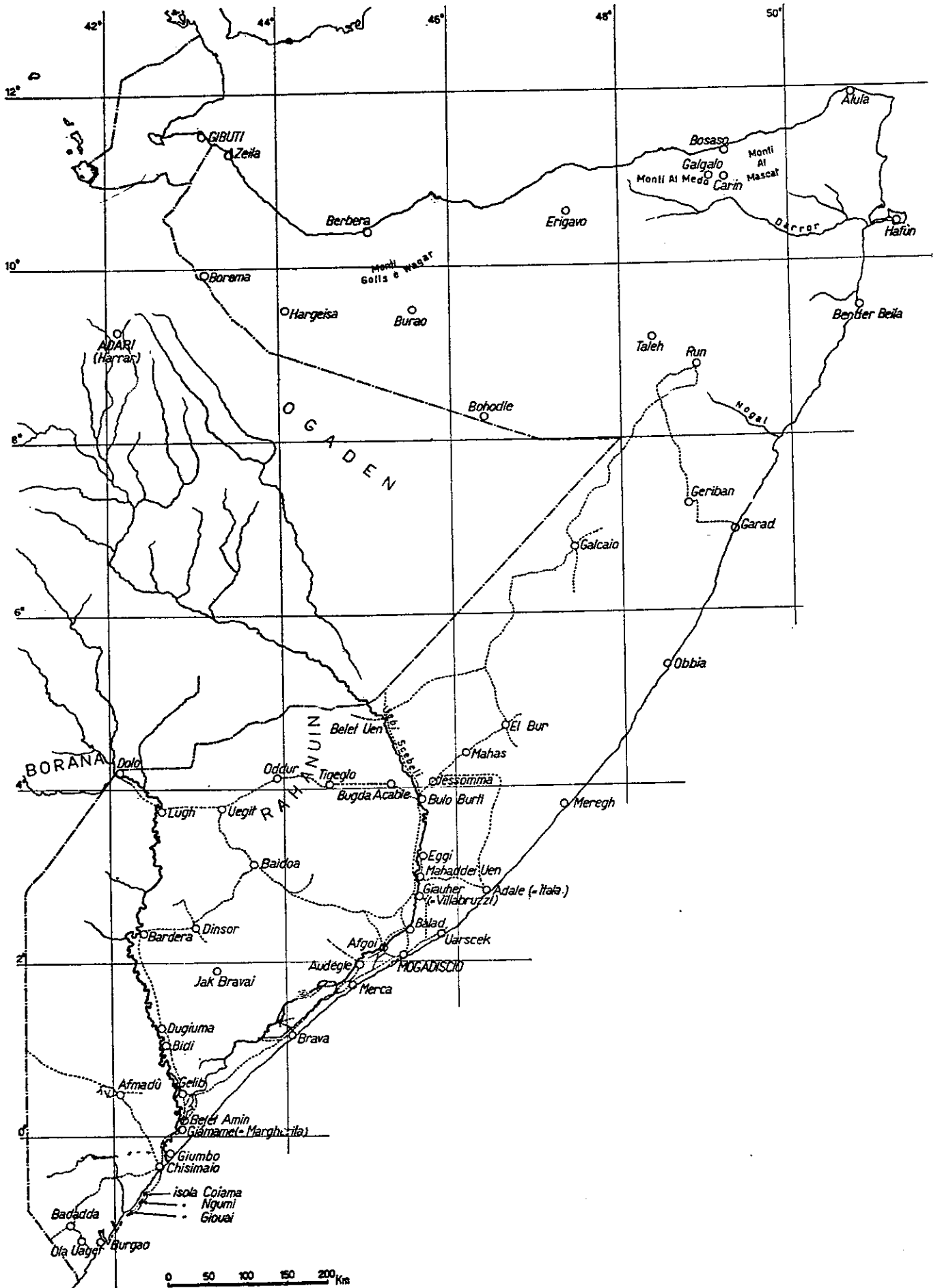


Fig. 1. — Itineraries covered by the authors.

evidence discussed both in the zoological and economic sections, we have added a short introduction on the geography and vegetation of Somaliland and its recent vicissitudes.

THE COUNTRY

BASIC FEATURES OF THE GEOGRAPHY AND CLIMATE OF SOMALIA

The total surface of the Somali Republic is estimated to be 637.661 square kilometers, 461.541 belonging to the former Italian Somaliland and 176.120 to the former British Somaliland.

Relief.

The country stretches over the largest part of an immense plateau, which gradually lowers towards the Indian Ocean and which is bordered along the coast by a belt of sandy dunes, sometimes moving, which average a height of about 100 meters and in some places are up to 100 km wide.

In the North, inland of the coast of the Gulf of Aden and extending to Cape Guardafui, the plateau is replaced by a chain of mountains (Uagar, Surud Ad, Ahl Medòu, Ahl Mascàt) in which the highest peaks are over 2.000 meters high. To the West, instead, the plateau falls abruptly into the Awash Valley and into the basin of the Galla lakes, both within the Ethiopian territory. To the South, finally, the Somali plateau merges, almost unnoticeably, with the alluvial plains of the Webi Shebeli and of the Juba, the joint line being marked here and there by erosion cliffs.

Hydrography.

Somaliland is a dry region and its hydrography is quite simple and meagre. There are two directions of flux: towards the Gulf of Aden and towards the Indian Ocean. The divide consists of the chain of mountains which in the North reaches Cape Guardafui. There are only two permanent rivers: the Webi Shebeli and the Juba, which both originate outside the Somali Republic. The other water courses are more or less temporary rivers which during the rains may even flood important areas, but which during the dry seasons either dry up completely or, at most, leave a chain of more or less extensive ponds.

The Juba (water flux 100 to 1.600 m³/sec.) crosses the country from North to South in the Southern region and has its mouth not far from Kisimayu. From a little South of Bardera, the Juba is bordered by a series of low lying basins, subject to floods (called « de-

sheks »), which are considerably exploited for agriculture and, where antropic action is not too intense, have a fine riverine vegetation.

The Webi Shebeli (water flux 0-180 m³/sec.) flows through Somalia first in a North-South direction, then, reaching Balad, turns abruptly South-Westwards because of the bar of coastal consolidated dunes and thence flows parallel to the coast-line without breaking through the sandy bar. After some 250-300 km the river ends in a series of swamps which stretch from inland of Brava almost to the Juba. The middle and lower course of the Webi Shebeli is in many places considerably higher (during floods) than the adjoining land, so that water can be easily obtained for irrigation over large stretches of farmland.

Both rivers have two flood periods coinciding with the rains in the Ethiopian plateau.

During exceptional rains, such as those of 1961, all the area around Gelib is flooded by both the Juba and the Webi Shebeli and turns into an immense swamp.

Among the temporary rivers which occur in the territory and which, owing to the presence along their course of pools of still-water or of water at about one yard under the soil even during the dry season, are often of considerable economic significance, the following require mention: in the Oltregiuba the Lak Badanà, Lak Dera, Lak Bush Bush; between the two great rivers the Baidoa and the Matagoi; in Mijurtinia the Nogal and the Darror; in the Northern Regions the Follà and the Dur Dur.

There are no true lakes, but small pools and swamps with permanent water occur here and there through the territory.

Geology.

The plateau which forms most of the Somali Republic is predominantly composed of sedimentary rocks meso- and cainozoic which lie on a granitgneiss basament dating from the pre-cambrian and which is locally uncovered by erosion as, for instance, in the many isolated hills (called « burs ») scattered between the Juba and the Webi Shebeli. The southern districts are covered by upper cainozoic deposits of riverine origin; the chain of fossil dunes which border the Indian Ocean are not older than the Pliocene. The northern mountains, instead, are of complex structure. Vast anhydritic deposits sometimes showing at the surface, but more often covered by a film of sand, are a conspicuous feature of most of central Somalia and are responsible for carsyic phenomena and for the existence of subterranean water tables occasionally of almost brackish water, the fauna of which includes several kinds of fishes either blind or with reduced

eyes; the associated invertebrate fauna is just now beginning to be studied by the Florentine expeditions.

Climate

The climate of the country, but for limited stretches adjoining the Gulf of Aden which have a subtropical climate, can be classed as equatorial, with scarce rains and is the result of the monsoon regime prevailing over the whole region.

The total rains (Fig. 2) increase from the northern strip towards the southern regions, ranging from minima of 50-75 mm a year in the northern mountains to maxima of 600-850 mm in the best favoured districts in the mesopotamic region.

The rhythm of the rains is characterized by two rainy seasons (called by the Somalis «gu» rains, from April to June and «der» rains, from October to December). These two rainy periods are separated by two dry seasons called by the Somalis «hagai» (July-September) and «gilal» (December-March).

Such a pattern is locally somewhat modified by various factors, so that one can distinguish three patterns in the distribution of the rains:

Coastal pattern: the rainy season of «gu» and «der» are joined by an «hagai» with small local showers.

Continental pattern: the typical one with the rainy season rather sharply distinct from the dry ones.

Northern coastal pattern: with extremely poor rains limited to the period November-February.

Other features of the rains in Somaliland are their wide range of variability as far as the yearly amount is concerned, the frequent abnormal length of the dry seasons and the overall local character of their geographical distribution.

The yearly mean temperature ranges between 27°C and 30°C, increasing from the coast towards the inland and from the coast of Cape Guardafui towards the western end of the Gulf of Aden. The range of variation by comparison with the yearly mean is, for each month, of but 3°C-4°C over most of the territory, but is much greater in the mountain regions of the North. Here the maximum average temperatures occur in June-July (45°C-46°C) and the minimum in December-January (12°C-14°C). In the rest of the territory the extremes of the temperature range occur in April (max. heat) and in July (min. heat).

Relative humidity is usually rather low in the North and inland, while it is fairly considerable along the coast.

All the phenomena mentioned so far are controlled by the alter-

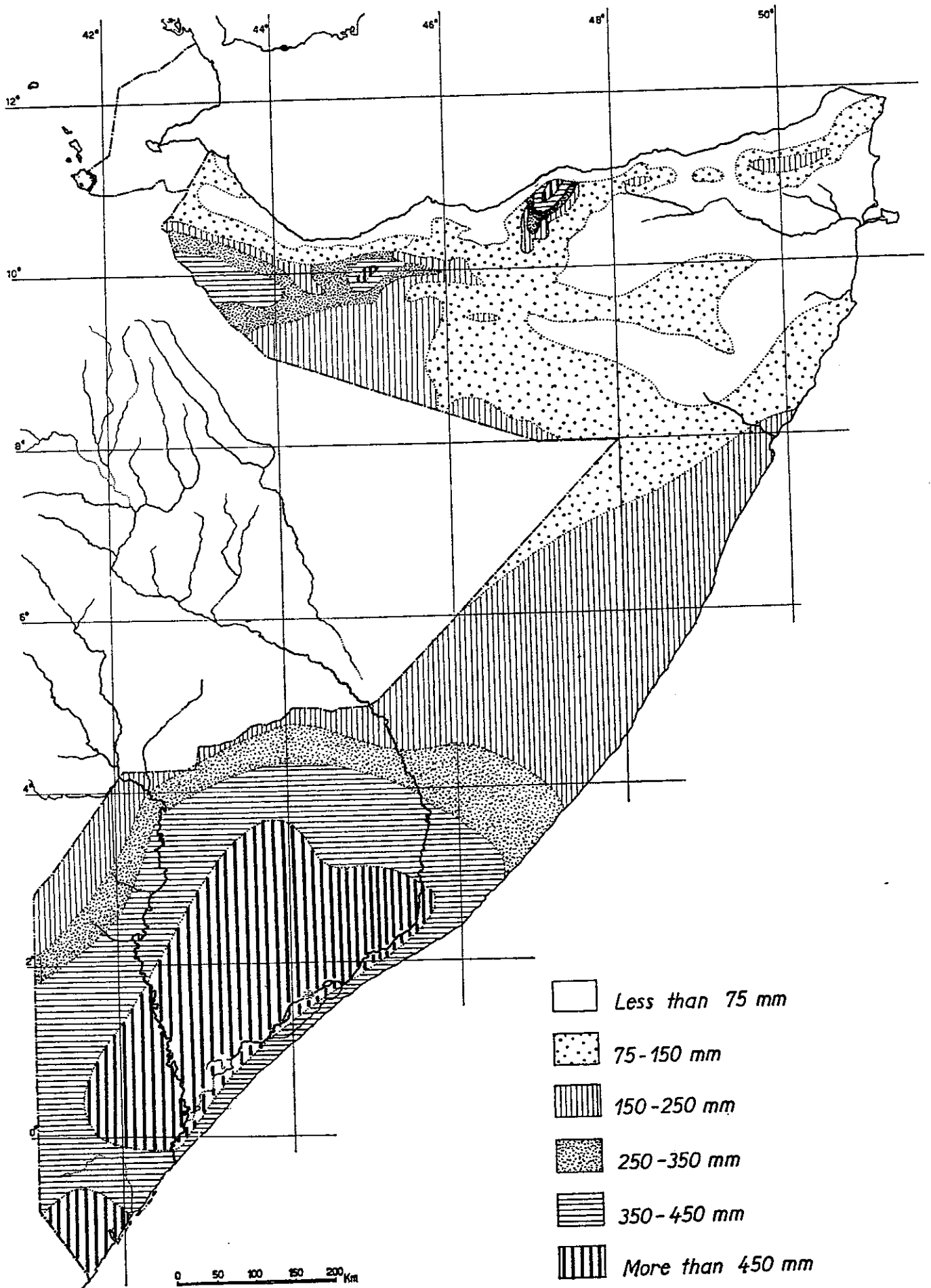


Fig. 2. — Average yearly rains (compiled from various sources).

nating of the monsoons: NE October to March and SW April to September. The periods in between the end of one monsoon wind and the beginning of the opposite one, covering each some 20-30 days, are locally called by the Kiswahili name « tanga m'bili ».

Evidence of climatic changes.

It is well known that during the late Pliocene and the Pleistocene the climate of the whole of Africa underwent repeated and great changes; particularly during the Pleistocene (the last million years) there were repeated shifts from extremely arid conditions, when the deserts extended hundreds of miles beyond their present limits, to conditions of humidity, the so called « pluvials », during which most of the present deserts were either bush or savannas, while the rain-forests greatly increased their areas.

Archeological excavations made in British Somaliland and cave paintings on one side and the invertebrate fauna of some oases in Mijurtinia (poorly known as it is) give unquestionable evidence of much greater humidity in the past than that occurring at present.

Though the available evidence is too scanty to really understand the pattern of the climatic changes that occurred in the past of Somaliland, yet it is evident that progressive dessiccation of the country occurred in the last millennia, thus favouring the diffusion of its peculiar fauna, which is made up, quantitatively if not in number of species, by animals more or less independent from the availability of permanent water.

Though it is impossible to guess whether such a trend towards desertification (quite apart from the human activity that all over Africa is fostering it) will continue or whether a reversal in trend will occur, it is obvious that all the species populating forest biotopes, such as riparian formations and the like, are living in a very precarious ecological situation. Of capital importance as well is the managing of the stocks of the species living both in the dry bush and in the more desert habitats, as these may well prove, in the future, to be the only mammals capable of surviving over most of the territory.

Vegetation.

The vegetation map (Fig. 3) has been modified from that of PICH SERMOLLI (1957). The considerable uniformity both in climate and relief are reflected by the vegetation: the dominant association, extending over immense stretches of territory, is the « bush »,

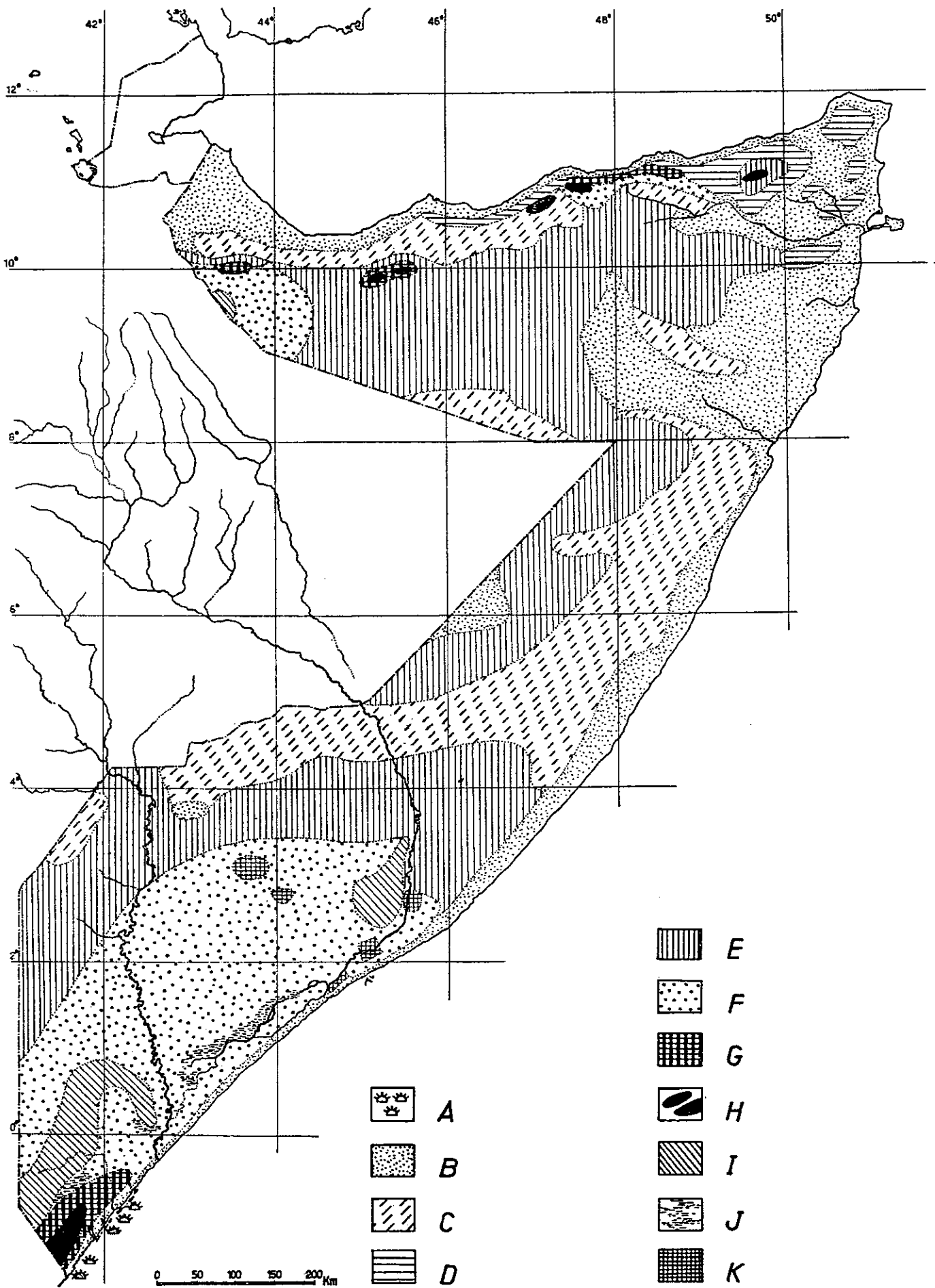


Fig. 3. — Sketch map of the vegetations of the Somali Republic, modified from Pi-chi Sermolli: A) mangroves ; B) subdesert shrub and grass; subdesert bush and thicket; C) subdesert scrub; D) subdesert shrub with trees; E) xerophilous open woodland; F) xerophilous bush and woodland; G) evergreen scrub, coastal secondary thick bush; H) forest, all types; I) savanna; J) swamps; K) farmland.

an open formation composed predominantly of low trees, scrubs and shrubs, mainly Leguminosae of the genus *Acacia* associated with Burseraceae, Capparidaceae, Combretaceae, Euphorbiaceae, etc. A more varied relief and climate exist in the North, providing some change in the otherwise monotonous vegetation cover: such is the typical formation with rupicolous Burseraceae in Mijurtinia and the rare relic *Juniperus* forests of the Northern Provinces, relics of pluvial periods. Where there is permanent water the vegetation is richer with many and more luxuriant species. Such are the river belts of the Juba and of the Webi Shebeli (where not destroyed by man) with pure *Hyphaene* formations and big specimens of *Ficus*, *Mimusops*, *Azelia* and *Trichilia*, or the *Conocarpus*-formations fringing the few permanent streams of the extreme North and the *Hyphaene-Mimusops* formations of the rare inhabited oases. The extreme South of the country, better watered both by the rains and the phreatic table, is covered by a true tropical forest quite different from that of the remaining part of Somalia and including many species peculiar to the district. In a few points along the coast, particularly at the mouth of the Juba and further South there are small mangrove formations rather degraded by overexploitation by the local population.

The bush that forms the bulk of the forestry resources of the country is exploited particularly for browsing by camels and goats as well as for fire-wood and charcoal both for local consumption and for export. The riverine forests afford a very limited possibility of exploitation for lumber. Another important product of the bush is the complex of resins produced by the genus *Boswellia* and *Commiphora* and essences for tanning.

As a whole forestry is badly regulated with irresponsible destructions everywhere as is clearly shown by the evidence summarized herewith, obtained from an unpublished report which the Forestry Department of the Ministry of Agriculture of the Somali Republic submitted in 1964. From it appears that woodland (be it forest or bush sufficiently thick to be classed as woodland) covered an estimated 21.200 sq. km in the Southern regions (1) out of a total surface estimated at some 461.541 sq. km. The yearly destruction of wood was estimated at the incredible figure of 1.700.000 tons, a truly alarming figure when one remembers the slow rate of recovery of woodland under dry conditions.

(1) To date the Governmental services in Mogadishu do not prepare statistics or reports comprehensive of the data from both the ex-Italian and the ex-British territories: we have been unable to obtain recent data from the Northern Provinces.

50% of the wood so accounted for was considered as being destroyed by age, parasites, bush fires, establishment of temporary subsistence agriculture, timber for construction of native huts, charcoal and fire wood used «in situ» by the population. The remaining 50% is traded either as wood (20% almost entirely used by the Somali population, chiefly by hospitals, Army, Police and other public services) or as charcoal (30%, one half of which is exported mainly to Arabia).

As a whole therefore it can be estimated that some 350.000 tons of wood are yearly exported from a country which is arid and subject to erosion.

THE MAMMALIAN FAUNA: STATUS AND DISTRIBUTION (Somali names in brackets and small capitals) (1)

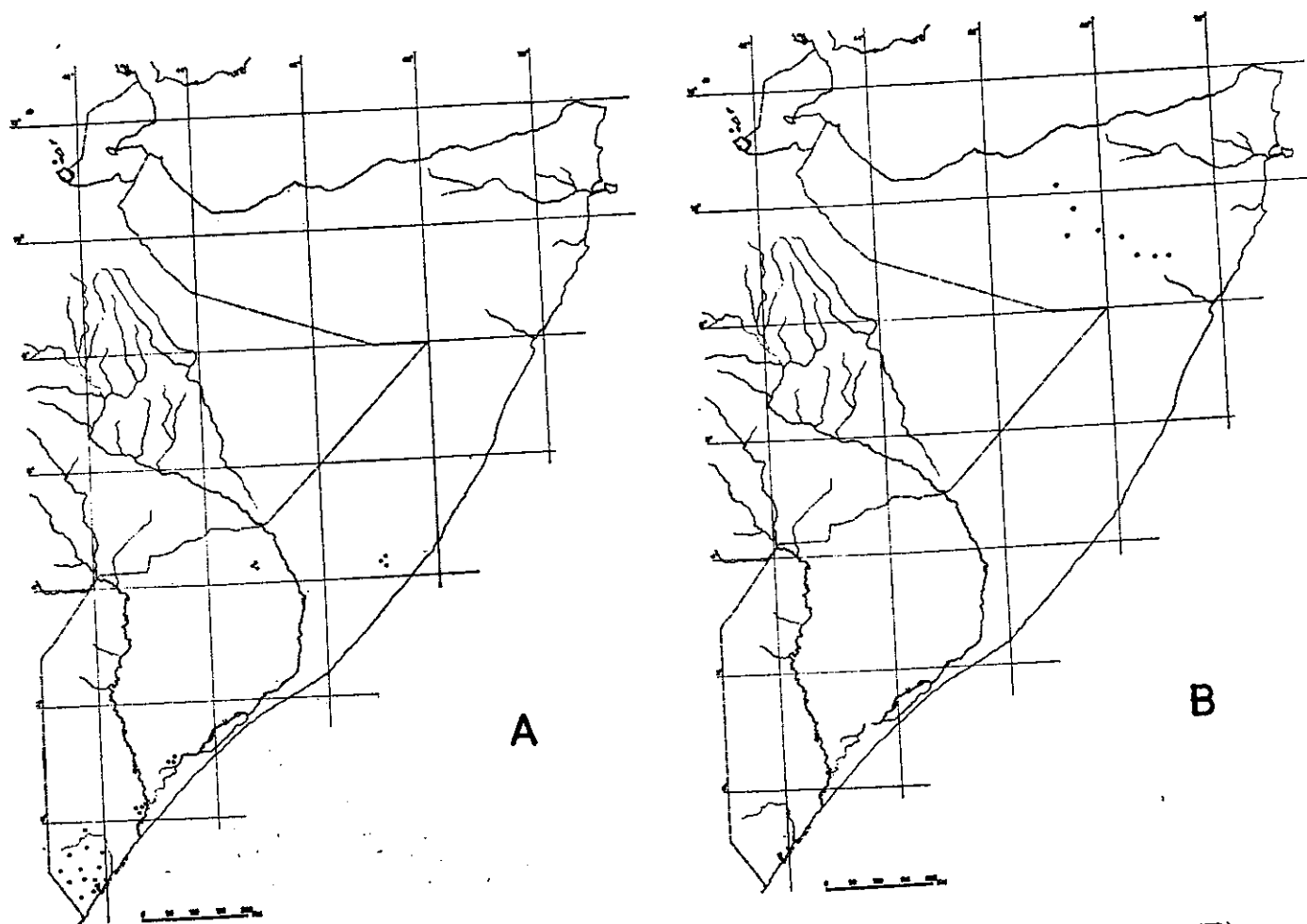


Fig. 4. — Present distribution of *Diceros bicornis* (A) and *Equus asinus* (B).

(1) Subspecific names which appeared either as doubtfully valid (SIMONETTA & AZZAROLI, 1966 and in preparation) or, eventually, based on insufficient evidence, have not been used when dealing with the Artiodactyla, Perissodactyla, Proboscidata, Carnivora and Sirenia.

Kenya, but, even allowing for this, there is no doubt that elephants are increasingly poached in Somaliland.

Both to preserve the Somali Elephant and to stop the illegal traffic with Kenya, thus helping conservation there, it is recommended that all tusks under 12 kilos (25 pounds) be subjected to confiscation by the Somali government and give proper regulation to the export of ivory by fixing the numbers of the tusks to be yearly exported.

CARNIVORA

FELIDAE

Acinonyx jubatus velox Heller 1913 (Fig. 19 B) (ARAMÀT, HAREMA'AD, ORCÒB HARAMAS).

Cheetahs have suffered a very serious depletion in these last years. Never a very common animal, though formerly occurring practically over the whole territory, it has by now disappeared from the more settled areas. It is rare where it still occurs and even in its stronghold along the Kenya border, where, up to now, reasonably common, it is now threatened by the difficulty of controlling the guerrilla groups operating in the Northern Frontier Province and who often take refuge for some time within the Somali border.

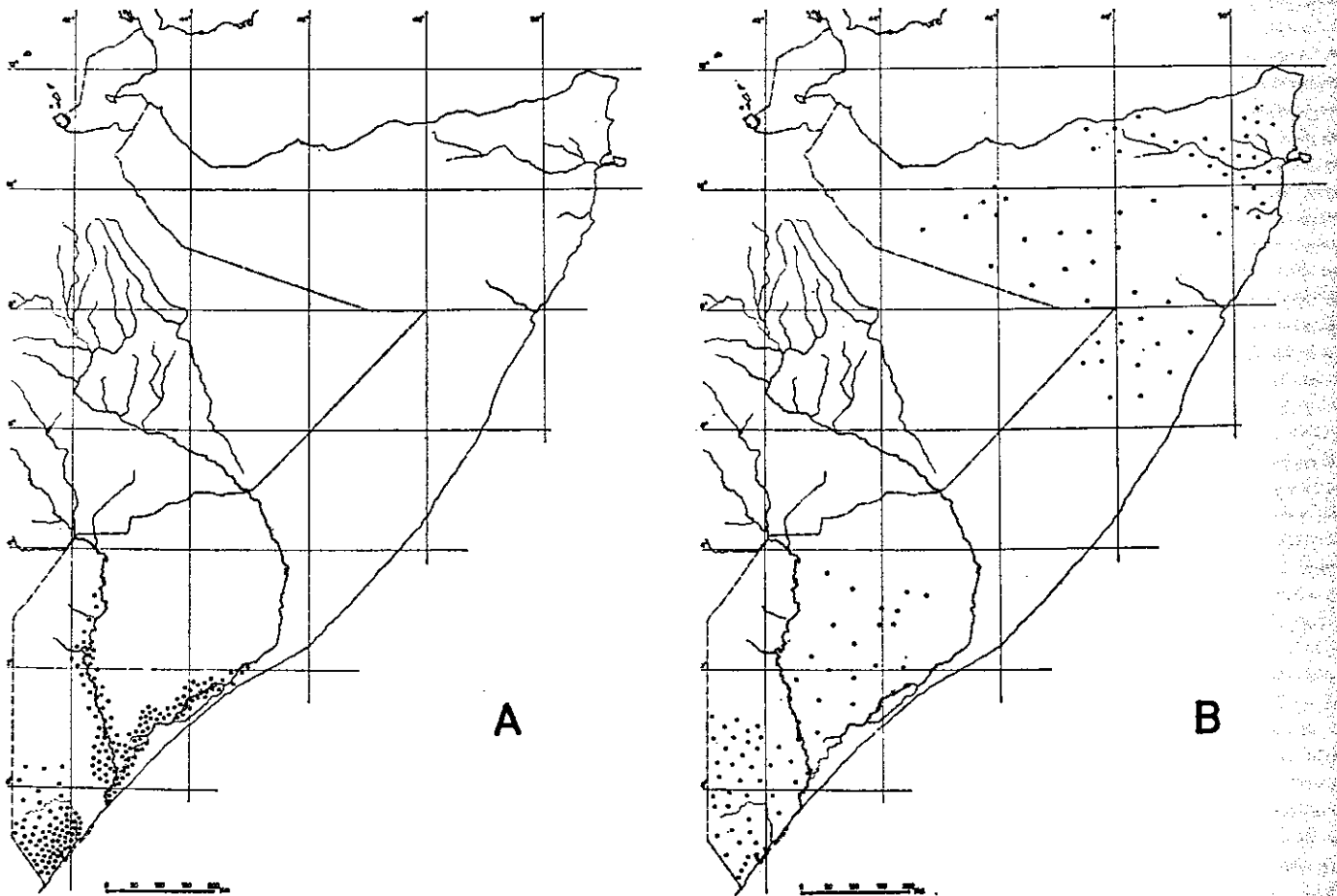


Fig. 19. — Present distribution of *Loxodonta africana* (A) and *Acinonyx jubatus* (B).

years plan, 1963-1967 » has been launched with a total intervention of the State in the various activities of 1.400.000.000 So.Sh.

As far as Fauna conservation is concerned, as well as for its rational exploitation, the « 5-years plan » envisages action, either directly or indirectly under the following headings:

Agriculture. Forestry, as the better exploitation of the resources is planned, some measure of habitat conservation will be enforced (Funds available for forestry 14 millions So. Sh.).

Tourism. All the funds are directly or indirectly available for fauna conservation as wildlife is considered to be the main tourist attraction (funds available 2 millions So.Sh.).

Public health and Veterinary services. funds available for animal husbandry are to be used to promote the health of domestic stock so that intervention, unless game eradication programs for tsé-tsé control are carried out, may indirectly be beneficial also to wild animals in curbing the possibility of epidemics spreading (fund available 12 millions So.Sh.).

CONCLUSION AND RECOMMENDATIONS

As shown by the evidence described in the paper, the Mammalian fauna of Somaliland is still better preserved than in many other African countries, however this is rather the result of accidental facts than of a well planned and enforced game policy. The increase in population, the increase in domestic stock, the progressive diffusion of fire arms (which have begin to be supplied — particularly the cheap .22 rifle — by hides dealers to the professional hunters), improvement in communications (which helps in fast disposal of the hides) are rapidly making obsolete the conditions favorable to the conservation of game, so that the situation is rapidly deteriorating.

Unless action is prompt and effective it will be only a matter of a generation and Somaliland will be as bare of wildlife as any of the poorest countries in Africa.

It is, however, evident that under the present budget strictures and without properly trained officials, the Somali Government is, however well meaning, powerless to control the situation.

In order to preserve and use for her own benefit a valuable resource, the problems of conservation must be considered a task for Somaliland. However some of the problems are of mainly scientific significance and of very little practical use. Therefore we believe that, while international assistance should be granted to the Republic to start an efficient game and conservation policy, permanent support

is needed for such aspects of conservation that will never become financial assets and which the Somali Government, pressed as it is by urgent social needs and with a seriously permanent deficit in its budget, can not possibly cope with.

As a whole, top priority should be given to the following problems:

a) Obviously needed is the revision of the present legislation to harmonize that of the Northern Provinces with that of the other provinces. Moreover it is absolutely urgent that game legislation be considered in connection with the necessary revisions of those in forestry and agriculture as, without proper management, habitat destruction will be as harmful to game as overhunting, not to mention the danger of desertification which is to be fought off by all means by the most careful management of the meagre resources both in water and cover.

b) The study of the possibility of enforcing rotation in the exploitation both of grazing areas and of game in the same areas, so that both game and cover will be allowed to recover.

c) The study of all the areas suggested as Nature Reserves and Controlled areas in order to best find their boundaries and the way to regulate them.

d) The starting at once of a rescue operation for the Wild Asses by establishing a breeding colony in the Nogal Valley. It is the writers opinion that, as a game reserve in the Nogal has to be established breeding should be attempted on the spot as such a station could also operate as a research station for investigators studying the deserts of the Horn of Africa.

e) The creation of a National Park in the area on both sides of the Webi Shebeli between Bulo Burti and Mahaddei Uen (Map n. 23B). This park may fulfill many purposes: first, owing to the exceptionally varied assemblage of mammals which occur in the area, Soemmerring's Gazelle, Dibatag, Gerenuk, Oribi, Grey Duiker, Lesser Kudu, Bushbuck, four types of Dik-Dik, Waterbuck, Bushpig, Warthog, Hippopotamus, Lion, Caracal Lynx, Serval Cat, many other Carnivora including possibly the Cheetah, and possibility of re-introducing the Rhinoceros, the Topi, the Oryx, the Leopard and the Elephant which have disappeared only in the last twenty or thirty years, the hundreds of Birds species ranging from the Ostriches to the tiny Sun-birds, coupled with its position within three hours motoring from Mogadishu, will make it ideal both for educational purposes and as a tourist attraction. It could play the same role in Somalia that Nairobi's National Park does in Kenya. In the meantime it would be an ideal area for training personnel as it offers a wide range of ecological conditions within limited space. Finally an international biological laboratory could be profitably establi-

shed there for the study of biological problems of the Somali Peninsula, as the area recommended offers the following range of biotopes: riverine forest, bush of various density, savanna, swamps, scrub.

f) To study how better to foster and organize tourist safaris: indeed it will be mainly through the realisation of the financial possibilities in this field that the Public Authorities and more generally the Somali people will become really interested in the conservation of the fauna.

g) Bring about international technical and financial support for the establishment and preservation of the Nature reserves and particularly of the Bubashi reserve and adjoining Beles Cogani Game reserve. On paper the last mentioned areas are already almost adequately protected, but in practice the situation is far from being satisfactory because of the local political situation. There are, indeed, particularly in the Afmedù-Beles Cogani area a number of refugees with their herds, so that overgrazing, deforestation and, eventually, poaching are to be feared.

If international agencies could be made to bear the burden both financial and technical, to recruit, train and staff the personnel necessary for an efficient National Parks Service for a period of at least six years, and to share in the investments necessary either to settle outside the Nature reserves those residents who might be found expedient to move from them, or to give the people allowed to remain the training and equipment necessary for the better usage of the plots and grazing which can be left for their usage within the reserves (1), we believe that time enough will be gained to allow for international difficulties being solved and the benefits of the completion of the next « five years plan » be felt, so that the Somali Authorities will be thereafter in a position to be able to run the Nature reserves.

We believe that the available evidence is already sufficient for dealing with points A) B) C) and G) of these recommendations, provided that competent advice on religious problems and traditional law is available, as it must be stressed again that, in a country like Somalia, modern legislation will be appreciated by the population, and thus there will be the possibility of really enforcing it, so far as it will be a consistent improvement on traditional practice, but, even if sound and officially adopted, all regulations greatly at variance with customary rights will be difficult, if not entirely impossible to

(1) It is to be noted that within the boundaries of all the reserves suggested in this paper there live at present probably less than 6,000 permanent residents and probably removal would be advisable for less than one thousand.

enforce, for lack of cooperation by the nomads and semi-sedentary population.

As far as the problem of the establishment of an efficient game service is concerned, our advice is that, apart from a limited and specially trained upper staff, recruitment of scouts should be strictly limited to the number needed for service in the Nature reserves or even entirely avoided. For control of poaching outside them it appears much better to rely on the regular Police forces and chiefly on the Ilalos.

Somali policemen and even more the Ilalos (local police depending from the District Commissioner) are born scouts. Therefore it will be sufficient, to start with, to train one graduate officer to take charge of the game problems (with a degree comparable with an Italian Doctor «Degree» or with a British «Master») and about six undergraduate senior chief wardens. Then the game department should be allowed to choose in each district at least two Ilalos, which should be specially charged as game scouts, while the present «game force» of the Police Corps should be increased to about 50 units and placed under the direct control of the game department for the protection of «Nature reserves» (otherwise as many scouts should be recruited). We believe that such are the more expedient measures to be taken in the next few years, and that the greatest success can be obtained if the wholehearted cooperation of the police corps can be obtained, as these forces are highly efficient; while we do not recommend the recruitment of an entirely new and costly service of scouts as such a body will never be sufficiently numerous to be able to control effectively the whole country. In fact we are afraid that as soon as a special service will be organized to take care of game, the other corps, which can easily, if issued appropriate instructions, control poachers, will become completely uninterested in the enforcement of game regulations on the ground that «there is someone whose duty it is to deal with these problems».

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Decreto di iscrizione rilasciato dal Tribunale di Firenze n. 1122

Città di Castello - Stabilimento Tipografico Editoriale - 1966