The Barbary macaque

J.E. Fa

The Barbary macaque *Macaca sylvanus* has been listed in the IUCN *Red Data Book* since 1975. This monkey is the only African non-human primate found north of the Sahara and the only member of its genus found outside Asia. It originally ranged throughout most of North Africa but its present and restricted distribution is the result of centuries of human interference and incursions into the once widespread primaeval habitats where it was common. It is now confined to a few pockets in Morocco and Algeria where it is threatened by further habitat destruction as well as hunting.

Since 1975 a number of scientists have expressed concern about the Barbary macaque's situation in the wild (Deag, 1977; Taub, 1977) and some conservation measures have been proposed. But the problem now is not only protecting the species in the habitat countries but also deciding how to use the surplus animals from the successful captive-breeding efforts in semi-natural enclosures in Europe. Although the ideal would be to reintroduce most if not all the surplus to the wild, the prospects for doing so are limited because the Barbary macaque is still not protected in parts of its range (the monkey is considered as an agricultural pest) and few natural areas are now suitable monkey habitat. Thus, despite the fact that the macaque may seem numerically safe, there is an urgent need to manage the captive propagation effort in line with the conservation of the wild populations in North Africa.

A conference which gathered primatologists, conservationists and experts on the Barbary macaque in Gibraltar in June last year, set out to define action necessary for the conservation of the Barbary macaque in the wild and in captivity. The consensus was that conservation of the species and its habitat in the wild was of utmost priority but that the self-supporting captive network can provide a financial and scientific impetus for this.

The situation in the wild

The Barbary macaque is discontinuously distributed in six regions of Morocco and Algeria: High Atlas; Middle Atlas; Rif; Chiffa; and the Grande and Petite Kabylies. The species only exists in large numbers in the Moroccan Middle Atlas where about 16,000 animals live, primarily in the high mixed cedar (*Cedrus altantica/Quercus ilex*) forests of the Central Zone (Taub, 1977). In the Rif Mountains numbers are lower—a maximum of 600 (Fa, 1982). The main areas of distribution in the Rif are the fir *Abies pinsapo* forests of Djebels Lakraa, Tissouka and Tazoute, where it has been estimated that up to 400 may be a realistic figure for the total population of the species in this habitat type (Mehlman, 1983), and in Djebel Tirizine, a cedar forest that might contain up to 200 monkeys (Taub, 1977). In the Rif the monkey is also found in *Quercus faginea/Q pyenaica/Q. suber* forests at Djebel Bouhassim at densities of fewer than two individuals per sq km (total population estimate of 70–100 animals) (Fa, 1982) and in matorral (scrub) habitats (Djebel Moussa and Beni Zaid region), but at considerably lower densities and population sizes (Fa, 1982; Alvarez and Hiraldo, 1975). Reports

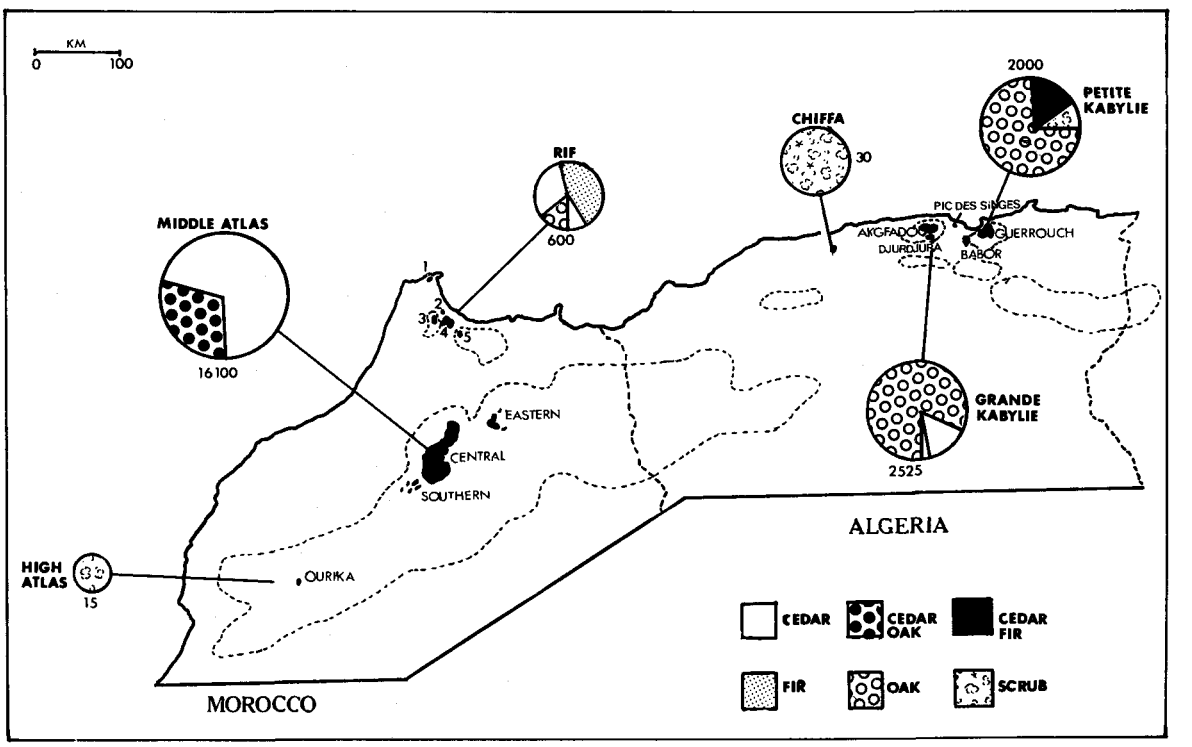
— the future

Adult female Barbary macaque with infant, Morocco *(Graham Drucker)*.

https://doi.org/10.1017/S0030605300024923 Published online by Cambridge University Press

of monkeys in the Ourika valley in the High Atlas have also been substantiated, but only one group has been accounted for (Deag and Crook, 1971). In Algeria, the monkey is found in the two main mountain ranges of the Petite and Grande Kabylies. Taub (1977) estimates that around 5500 Barbary macaques—about 23 per cent of the total number in the wild—occur in Algeria. High densities and populations exist in the *Quercus afares/Q. faginea/Q. suber* forests in Guerrouch and Akgfadou, but lower numbers are found in the cedar forests in the Djurdjura and in the cedar/fir (*Cedrus altantica/Abies numidica*) forests of Djebel Babor. Three other populations of monkeys are found in the Chiffa gorge, south of Algiers, at Kerrata near Babor, and on the Pic des Singes in Bejaia, but they are small. All are accustomed to people and are to a large extent provisioned by tourists visiting the areas.

Historical records clearly show that the present distribution of species such as the Barbary macaque is related to past human settlement patterns (Fa, 1983a). Through deforestation for timber and fuel since Roman times and the conversion to agriculture and pasture, especially after the Arab conquest, the species is now almost exclusively restricted to the higher mountain ranges. The few scattered monkey populations still present in the lowland areas testify to the once widespread distribution of the species. However, the prime, high altitude ecological islands are areas of primaeval forest, such as mixed oak, cedar and fir, where man has been unable to settle until recently because of their inaccessibility. But now even these refuge sites are increasingly subject to human pressure. Persistent and uncontrolled tree felling and deliberate and accidental fires are fast reducing the forests, and the large number of livestock that graze there prevent regeneration and cause erosion. As well



General distribution of the Barbary macaque in North Africa.

Rif: 1—Djebel Moussa, 2—Beni Zaid, 3—Djebel Bouhassim, 4—Djebels Lakraa, Tissouka, Tazoute, 5—Djebel Tirizine.

https://doi.org/10.1017/S0030605300024923 Published online by Cambridge University Press

as losing its habitat, the species is killed by shepherds and captured for sale to tourists or to keep as pets.

The animal in captivity

The status of the Barbary macaque in captivity has varied in recent years. Since 1964, from records kept by the International Zoo Yearbook, the number in zoos and wildlife parks has increased progressively from an average of two to 168 animals per collection. Likewise, the actual number of collections that have kept the monkey has increased from nine to 28 during the same period with 70 per cent being European. Of these, nine are British, seven German, six are in the United States; the rest are in Africa (two), Canada (one), Poland (one), Czechoslovakia (one) and Gibraltar (one). The main reason for the increase in the number of captive stock, especially after 1974, has been the setting up of two large enclosures (11–20 ha) in France (at Kintzheim and Rocamadour) and one in West Germany (Salem) by Baron Gilbert de Turkheim. A total of around 200 monkeys are born in these enclosures every year. In contrast, no other collections except those in Chester, Washington and Toronto have ever kept viable groups of more than four animals. Gibraltar, in a class of its own, has consistently maintained two groups of 15–20 individuals since 1936 (Fa, 1981, 1983b). At present at least 200 individuals every year will become surplus to the space and needs of the enclosures. Because these enclosures are maintained as tourist attractions as well as providing valuable research centres it is crucial to keep density to a manageable level.

Direction

Difficulties can arise when endangered species are successful breeders in captivity and restocking the species in the wild is difficult due to the deterioration and loss of natural habitats. The obvious question facing conservationists is whether conservation of endangered species means efforts directed at keeping the species *per se* alive (i.e. eventually as mere exhibits in zoos and wildlife parks) or whether the primary aim should be to breed in captivity to ensure the protection of the animal in the wild. It is, of course, not suggested that the keeping of the animals as exhibits does not fulfil an important role in educating people. It is, however, crucial to realise that keeping live specimens of animals alone is not sufficient and that the aim of protecting the species in the wild needs cooperation between institutions, education of staff and accurate record-keeping (Stevenson, 1983; Warland, 1975).

The Barbary macaque has, perhaps too soon, reached a self-sustaining level in captivity through the efforts made in the semi-natural enclosures. There is a danger that the relatively easy availability of the species may result in a demand for biomedical research. A point in favour of this would be that in establishing the Barbary macaque as a readily accessible primate model, other species of macaques would become safe from further exploitation. But if a strong precedent is set for the use of the Barbary macaque as a biomedical model any eventual disruption in the supplier network would put the animal in the wild in serious jeopardy. A total world population of 23,000 monkeys in North Africa compares unfavourably with the numbers of other macaques found in SE Asia—especially when imports of rhesus *Macaca mulatta* to the USA alone numbered 73,290 in 1968 (Taub, 1977), more than three times the present Barbary macaque population. Protection must therefore be given to the species in captivity, and the wild population should not be trapped for invasive research or for any reasons other than for conservation purposes. Habitat destruction must be curbed in the habitat countries and areas set up for the protection of the species and its habitats. Ultimately, however, success could come from a concerted effort which will use the animal in captivity for educational purposes; the income generated could be channelled into the conservation of the monkey in the wild. It is not impossible, indeed it is desirable, to conceive the idea of establishing a financially self-supporting programme which would train North African personnel and help manage the national parks in Morocco and Algeria to save the species from extinction.

Recommendations

The following list of recommendations were

developed in conference at Gibraltar to clarify the main problem areas and the immediate action that needs to be taken. It is intended to incorporate them into a long-term conservation programme which takes into account and supports the independent action taken by institutions involved with the Barbary macaque.

A Recommendations for the protection of the Barbary macaque by countries

Morocco

Since most of the Barbary macaque populations and forest habitat are found in Morocco where the primary areas of their distribution are under strong and continuing pressures of degradation from legal and illegal exploitation, highest priority should be given to:

(a) Assisting the *Ministere de l'Agriculture et de la Reforme Agraire* through their offices in *La Division des Eaux et Forets* in developing a broad system of national parks and smaller eduction/tourist parks.

(b) Initiating response within the Moroccan legal system to develop and implement laws on wildlife protection, especially to restrict capture, sale and exploitation of animals and plants.

(c) Cooperating with universities and learned institutions to develop programmes of instruction and research on Moroccan wildlife.

Algeria

Algeria has a formal programme of national parks. There are some 13 national parks, three of which contain Barbary macaques and are of considerable importance as forested habitats. Utmost concern should be given to:

(a) Assisting the Secretariat d'Etat aux Forets a la Mise en Valeur des Terres in producing management plans for the relevant national parks.

(b) Cooperating with universities and learned societies in the country to develop further programmes of instruction and research on the Algerian forests and their wildlife.

(c) Initiating response from the Algerian legal system for the country to ratify the Convention on International Trade in Endangered Species of Wild Fauna and Flora and support the existing national effort to introduce new environmental laws.

Gibraltar

Although the British Army has been successful in maintaining the stock of Barbary macaques in Gibraltar for more than 68 years, the present management system exercises constraints on the proper use (educational, scientific and commercial) of such an important population of animals. There are currently problems with overfeeding and with disturbances from people visiting the important tourist attraction the monkeys present for the Rock. The effect of this is proving detrimental to the breeding of the species and could present further problems in the future. The Barbary macaque in Gibraltar is a potentially viable financial enterprise which, if managed on the lines of a park, would benefit both the monkeys and the Gibraltarian economy. It is thus recommended that the Gibraltar Government give every support to the development and implementation of the proposals already submitted by Fa and Pankhurst (1982) and which have been endorsed by the Primate Society of Great Britain.

B Regulation of trade

Because numbers of the Barbary macaque in the wild are declining rapidly at present due to habitat destruction and overall human pressures it is crucial that the species should receive greater protection against capture and export by changing the Barbary macaque's position in the CITES appendices from Appendix II to Appendix I.

C Control of research

Because the Barbary macaque is a vulnerable species in the *Red Data Book* and in accordance with the IUCN/SSC Primate Specialist Group, WHO and the Ecosystems Conservation Group and the Primate Society of Great Britain (which has expressed concern in resolutions and policy statements opposing the continued use of threatened species in captive research):

(a) No further capture of the Barbary macaque should be made from the wild (only in exceptional circumstances where the conservation management authorities in habitat countries may decide to capture animals for strict conservation purposes only).

(b) No new research should be started on this species in captivity, unless monkeys are obtained from self-sustaining captive breeding colonies (i.e. all subjects should be F2 generation at least).

(c) Existing research on the Barbary macaque in captivity should be phased out unless the monkeys are obtained entirely from self-sustaining captive-bred populations.

D Priorities for use of surplus monkeys from captivity

Since Barbary macaques in captivity are successful breeders, surplus monkeys should be treated according to the following criteria:

(a) Reintroduction to the wild, according to guidelines of international conservation organisations and those set out by Caldecott and Kavanagh (1983) with the co-operation of WWF/IUCN.

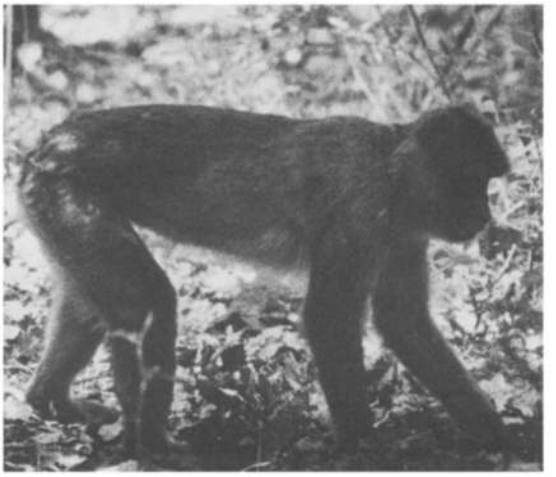
(b) Establishment of new parks wherever feasible, subject to the requirements of the owner of the monkeys being met, and subject to strict national guidelines.

(c) Loans to zoos for conservation purposes, according to the requirements of the owner, and subject to strict guidelines being observed.

(d) Sale of surplus animals from (b) and (c) to legitimate research, preference being given to non-invasive research (that could also have a conservation output), according to the requirements of CITES and international conservation organisations.

E Documentation and data retrieval of the breeding performance of the Barbary macaque in captivity

In order to carry out successfully a programme of conservation which caters for the species in captivity as part of the concern expressed for the survival of the monkey in the wild, it is essential that collection and analyses of demographic data from all parks and zoos be undertaken immediately.



Sub-adult male Barbary macaque, Morocco *(Graham Drucker)*.

Priorities

It is obvious that the first priority is to help promote the establishment of national parks in Morocco and afford help to Algeria to manage the existing ones. While it is agreed that the national park situation should be funded first, research on ways of protecting the habitats in question needs to be undertaken. A back-up of efforts to increase awareness in the habitat countries and elsewhere in the world should be contemplated soon. At the same time, the problem of the surplus monkeys generated within the enclosures in Europe must receive immediate attention. A short-term solution to this might be the creation of new parks, but there is also the possibility of initiating a study to assess the likelihood of success in releasing monkeys in some Tunisian forests, e.g. El Feijda or Chimba oak forests, which would not only enhance the tourist potential of these areas but at the same time create a new area of distribution. Sites likely to be suitable for reintroduction in the present range countries must also be studied. It has to be accepted, however, that in the long run surplus monkeys could be sold to research (following the guidelines set out in the recommendations) if culling or birth control is not seen as the ultimate solution.

Acknowledgments

The recommendations set out above were arrived at as a joint effort between delegates at the Barbary macaque conference held on 16–20 June 1982, at Gibraltar. I am most grateful to the following for their cooperation and enthusiasm:
F. Alvarez (Spain), W. Angst (W. Germany), B. Asselah (Algeria), F. Braza (Spain), J. Caldecott (UK), D.J. Chivers (UK), M.J. Coe (UK), G.R. Drucker (UK), N. Ellerton (UK), A. Gautier (France), J–P. Gautier (France), P.W. Hopkins (Spain), M. Kavanagh (UK), N.S.E. Martin (UK) W.C. McGrew (UK), M. Meziane (Algeria), P.M. Mehlman (Canada), A. Paul (W. Germany), D.M. Taub (USA), G. de Turkheim (France) and S. Wendland (UK). I would also like to acknowledge the support and help of J.M. Deag (UK), F.D. Burton (Canada) and R.A. Mittermeier (USA) *in absentia*. Financial support for the conference was given by WWF/IUCN, ffPS and the Gibraltar Government.

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