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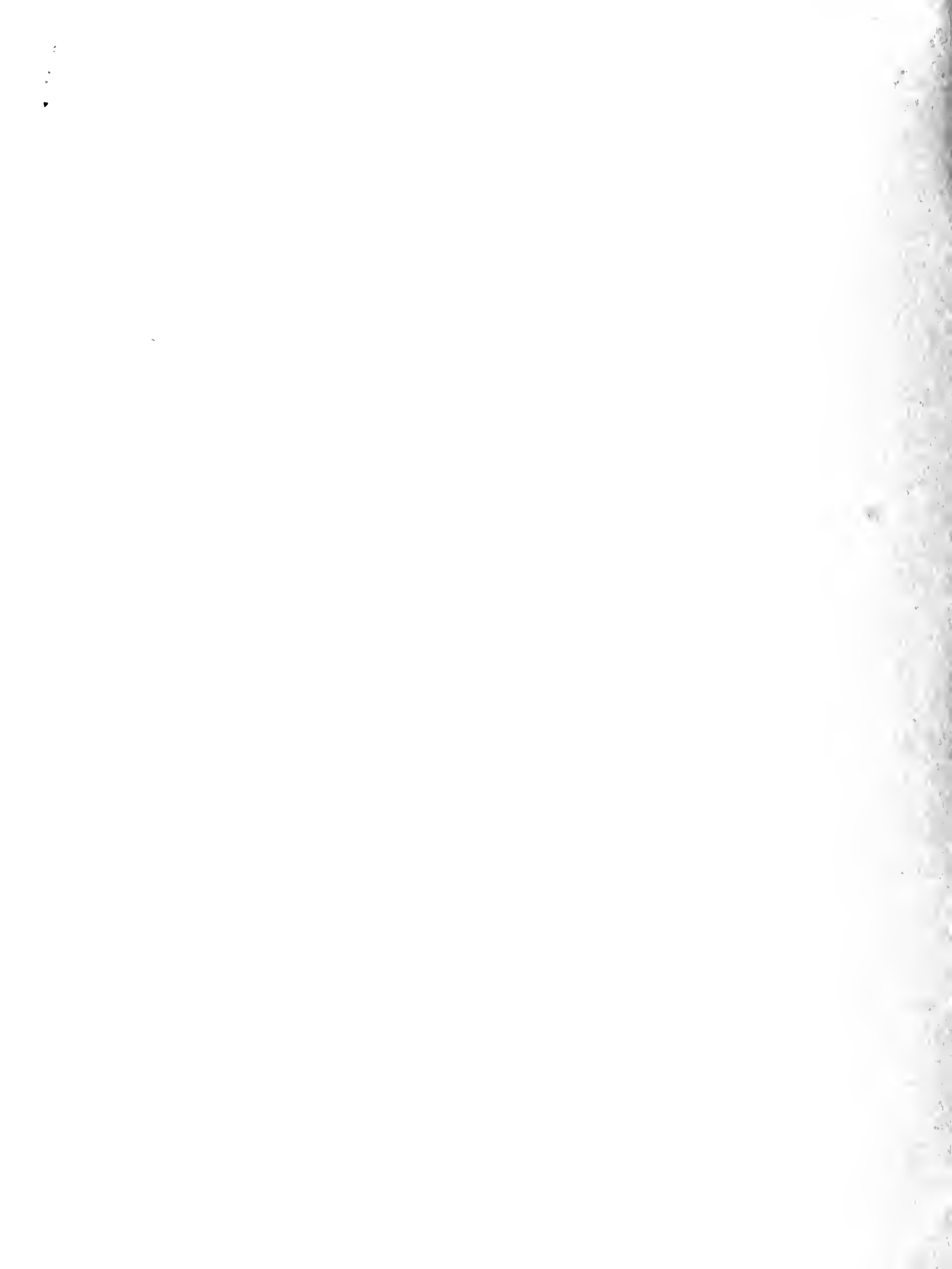


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# STATUS REPORT ON CATS (FELIDAE) OF THE WORLD, 1971

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**UNITED STATES DEPARTMENT OF THE INTERIOR**  
**FISH AND WILDLIFE SERVICE**  
**BUREAU OF SPORT FISHERIES AND WILDLIFE**  
Special Scientific Report—Wildlife No. 157



UNITED STATES DEPARTMENT OF THE INTERIOR  
Fish and Wildlife Service  
Bureau of Sport Fisheries and Wildlife

STATUS REPORT ON CATS (FELIDAE) OF THE WORLD, 1971

by

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Special Scientific Report--Wildlife No. 157  
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## PREFACE

This status report was prepared in the latter part of 1971 for the Department of the Interior to assist in revising the listing of cats on the United States List of Endangered Foreign Fish and Wildlife. On the basis of the data presented here, the Department in March of 1972 enlarged the list of cats to include eight species, as well as five subspecies of other species that had previously been listed. The report is published here in virtually the form in which it was prepared for the Department, with only minor deletions of in-house recommendations and suggestions.

It is fully recognized that in dealing with a group as large and important as the cats, and operating under the time limits imposed, we may have overlooked some pertinent publications and other sources of important data; that is one reason for publishing this report. We urge that all persons who have data on any species of cat, either in support of or in opposition to listing it as endangered, contact the author, or the Office of Endangered Species and Foreign Affairs. This report will be appraised at intervals, and pertinent data will be incorporated. Additional species may be proposed for listing, or some now listed may be recommended for removal, on the basis of new information received.

Your cooperation in providing new data to keep this an up-to-date and comprehensive report on the status of cats of the world will be appreciated.

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## INTRODUCTION

There are 36 species of wild cats (Felidae) recognized in the world today. Part I of this report presents evidence that eight of these species (including all of their currently recognized subspecies) are endangered because of one, or all of the following factors: drastic modification of habitat, over utilization for commercial purposes, and inadequate regulatory mechanisms. The endangered species are as follows:

Cheetah	<u>Acinonyx jubatus</u>
Leopard	<u>Panthera pardus</u>
Tiger	<u>Panthera tigris</u>
Snow Leopard	<u>Panthera uncia</u>
Jaguar	<u>Panthera onca</u>
Ocelot	<u>Felis pardalis</u>
Margay	<u>Felis wiedii</u>
Tiger Cat	<u>Felis tigrina</u>

This report draws upon the best scientific, commercial, and management data available today. It is virtually impossible to know the impact of illegal hunting on the total populations of the above species, for in almost every foreign state, the undercover means employed by poachers, the ease with which national borders can be passed by smugglers, and the small enforcement staffs available, combine to make management analysis of these secretive mammals a massive task. Sustained yield management, as we know it in the United States, has not been practiced on any effective level in countries where these cats occur.

Taxonomic definition of the subspecies of the above eight species is, at best, primitive. Many subspecies are based on only one or two specimens and are not valid. Many species were taxonomically studied decades ago and modern taxonomic techniques have not been applied to substantiate subspecific categories.

We have no documented or authoritative report, from any knowledgeable source available to us, that a stable population of these species or subspecies exists anywhere within their present ranges.

Part II is an annotated list of species that cannot be considered endangered at the present time.

## Part I

### ENDANGERED SPECIES OF CATS

#### CHEETAH (Acinonyx jubatus)

##### Former distribution

Over most of Africa, the Arabian peninsula, Iran, Afghanistan, Russian Turkestan, and into central and southern India (Ellerman and Morrison-Scott, 1951; Denis, 1964; Harper, 1945).

##### Present distribution and status

"The cheetah is extinct in India, and is reported to be very rare in Pakistan, Afghanistan, and Russia... The most recent sighting in India was in 1951. In Iraq, 1928 was the last sighting and until recently a remnant population persisted in Saudi Arabia, Oman and perhaps Asian Russia," (Eaton, in press). Aliev Farman Fatullah (pers. comm., January 1972) estimates that there are only between 10 and 15 cheetahs left in the entire U.S.S.R. However, the cheetah is increasing now in northwest Iran as a result of protective measures offered by that country's Game Department (Harrington, in press). Harrison (1968) states that they may be extinct in Arabia, and that they present the most urgent conservation problem. The endangered status of the asiatic cheetah (A. j. venaticus) is well documented by the I.U.C.N. (Red Data Book).

Cheetahs now occur in East Africa, north through Somalia and Ethiopia and west to Nigeria (Petrides, 1956). Scattered remnants may occur elsewhere. Ansell (1960) states that cheetahs are nowhere common in Northern Rhodesia. Brynard and Pienaar (1960) say that in Kruger National Park cheetahs are alarmingly small in numbers, and reproduce poorly. Snead (1958) reports that they are extirpated in the Uitenhage and Cradock Districts of the Cape Province. Bateman (1961) found that cheetahs were extinct in Brasadorp and Swellendam Districts near Bontebok National Park in the Cape Province. Sikes (1964) states that cheetahs were suspected to occur in the Yankari Reserve of Northern Nigeria, but gave no supporting data. In 1961, Major Ian Grimwood felt they were threatened with extinction in Kenya (from Denis, 1964). Schaller (1969) found that there was good habitat for cheetahs in the Serengeti National Park, but their numbers there were very low. Eaton (in press) writes that in southern Africa the cheetah has disappeared from the Cape Province, the Orange Free State, Natal and Southern Transvaal. Thirty years ago they were rare throughout Southern Rhodesia, sparse throughout Northern Rhodesia (Zambia today), and rare in Nyasaland (Shortridge, 1934).



The only area in which cheetahs apparently still exist in some numbers is East Africa. There are also populations in Somalia and Ethiopia, but the Somalia population has declined very recently due to lack of effective protection (Eaton, in press).

Denis (1964) places the cheetah in his conservation category D which is reserved for the most endangered forms.

### Numbers

Pienaar (1968) estimates that in Kruger National Park there are perhaps 250 cheetahs and their numbers are decreasing through shifts in the ecological system rather than from poaching. George Schaller (pers. comm., Nov. 15, 1971) reports that on the Serengeti Ecological Unit there are between 200 and 250 cheetahs; in Nairobi National Park there are 15; and on the Masai Steppe Reserve there are less than 20. He states that: "Except for Nairobi (area 115 sq. km.) cheetahs obviously exist in low densities. This makes the species highly vulnerable."

Eaton (in press) states that: "There are probably no more than 2,000 cheetahs remaining in all (the parks) of Africa."

Game laws (From Division of Management and Enforcement, Bureau of Sport Fisheries and Wildlife)

The cheetah is recognized as rare or endangered in the following countries, and hunting is not allowed nor are exports permitted except under special permits or licenses: Ethiopia, Botswana, Chad, Kenya, Somalia, and Togo. In Cameroon and Dahomey, no spotted cats may be exported. Saudi Arabia permits exports, but the game department believes that cheetahs are extinct.

### Imports and their impact

The Bureau of Tariffs lists imports of cheetah skins into the United States as follows:

1968.....	1,300
1969.....	1,900
1970.....	0

The Furriers Joint Council of New York and its affiliated members across the U. S. who make up the great majority of trade workers, agreed not to handle cheetah pelts in 1970. This, apparently, was the major factor in the decrease in cheetah pelt imports in 1970. Nevertheless, the 3,200 pelts taken in 1968 and 1969 alone are very alarming. They would account for 1.5 times as many cheetahs as would be found in all of the national parks of Africa (Myers, 1971).

Live cheetahs imported into the United States (from U. S. Department of the Interior form 3-177) were as follows:

1968.....73

1969.....46

1970.....12

It is obvious that the fur market has been the primary importer of cheetahs into the United States in recent years.

### Summary

The cheetah is near extinction in Asia. In Africa, its numbers are dangerously low. The cheetah is now extinct in most of North and West Africa where it once had good sized populations. They are still holding on fairly well in East Africa. Cheetahs probably did as well in parts of Somalia and Ethiopia as anywhere, but unrestricted hunting and skin markets have shown their effects. There are probably no more than 2,000 cheetahs remaining in all the parks of Africa. Cheetahs have been reduced to their present low numbers through over utilization for commercial purposes and the inadequacy of existing regulatory mechanisms.

### LEOPARD (Panthera pardus)

#### Former distribution

The most widely distributed of any species of cat, the leopard occurred throughout most of Africa, and from Asia Minor to China, Korea, Japan and Java. It inhabited all of India, Ceylon, and Southeast Asia (Allen, 1939; Ellerman and Morrison-Scott, 1951; Chasen, 1940).

#### Present distribution

The leopard is still widely distributed; it is not a shrinking of the animal's range that is disturbing with this species, but rather a reduction in numbers.

#### Status, with comments on the skin trade in leopards

Although the overall range of the leopard remains much the same as formerly, the IUCN recognizes the endangered status of certain populations by listing them in their "Red Data Book." These are the Amur leopard (P. p. orientalis), distributed in eastern Siberia and Korea; the Sinai leopard (P. p. jarvisi), distributed in the Sinai Peninsula; the Anatolian leopard (P. p. tulliana), distributed in

western Asia Minor to Transcaucasia; the Barbary leopard (P. p. panthera), in Morocco, Algeria and Tunis; and the south Arabian leopard (P. p. nimr), ranging in the Arabian Peninsula. Testimony of authorities, however, shows that all subspecies of the leopard are endangered through actual and threatened habitat disruption, and over utilization for commercial purposes.

The secrecy and stealth of the leopard make it impossible to say with certainty that the species has been extirpated in any particular region. These same factors make it impossible to obtain any reliable information on the actual numbers of leopards present in most areas. For the leopard, it is necessary to depend on the opinions of responsible scientists and others who have long experience with the species, and also the opinions of the game agencies in countries in which the leopard occurs. In November 1970, Norman Myers of the University of California wrote to the government officials and other authorities in Africa south of the Sahara. Each was asked how he adjudged the status of leopard populations, what data were available on trade trends, what fresh legislation was planned or implemented, whether he considered the situation one which Africa could handle alone, or whether any other action such as a moratorium by overseas nations would be appropriate. The replies he received indicated a growing concern in Africa for the dwindling status of the leopard. The following quotations (taken from Myers, in press) are from these replies:

#### Botswana

"I do not think that the leopard population in Botswana has been reduced significantly in the last five years. From 1971 the commercial export of leopard skins from Botswana has been prohibited...I consider that the time has come to prohibit the export of leopard skins for the fur trade from all African countries. I am also in favor of the receiving countries banning the import of leopard skins."

Chief Game Warden, 1971

#### Cameroon

"Poaching and illegal skin sales are increasing to such an extent that consideration should be given to getting this problem under control as soon as possible--it would be more efficient to start this operation on the American and European side [restrict imports, etc.]....At the moment there are no reliable figures about trade. Even if you do find

figures about Cameroon, I am sure that this represents only a fraction of the real skin movements....I doubt whether West African countries have reached the state of being able to manage this particular species in a scientific way."

Director, College of Wildlife  
Management, Cameroon, 1971

### Central African Republic

"There is a considerable illegal trade, which, given the means at our disposal, is very hard to resist....We have introduced fresh legislation... and stricter customs controls, occasioned by the disappearance of this animal....We are quite ready to support worldwide action to protect the species."

Directorate of Water, Forests,  
Game and Fisheries, 1971

### Ethiopia

"...thousands [of leopards] are shot or trapped illegally throughout the country....[As] a source of leopard skins, Ethiopia...runs to possibly 6000-8000 a year, perhaps more....It being a very lucrative business, the dealers can afford to pay generous bribes to Government officials, including members of the Wildlife Conservation Department. As a result, not only is a blind eye turned to their activities but they receive valuable assistance and protection from those whose job it is to protect wildlife. Game Guards know that to interfere with the "recognized" dealers will result in their dismissal if not worse, whereas cooperation will be rewarded by generous "bonuses" over and above their meagre salaries. Similarly a little judicious bribery among more senior officials enables the dealers to have their skins stamped with the official Wild Life Conservation Department stamp, thus rendering them "legal." This is usually done at night...an unofficial fee of ten dollars [Ethiopian, equals U. S. \$4.00] per skin being paid for his services....There is certainly a big smuggling traffic by camels....Probably some are also sent by rail and air, hidden in bundles of hides, etc....Leopard are undoubtedly on the road

to extinction in Ethiopia as things are at present. As skins become more difficult to obtain their value increases and provides a bigger incentive to the local poachers to hunt down every last leopard....The 300 Ethiopian dollars [U. S. \$120] for which a poacher can sell a good skin is equivalent to nearly a year's wages for an unskilled laborer."

J. H. Blower, Chief Game Warden, 1968

"I frankly don't think there is the slightest possibility of stopping the leopard skin racket in a country such as Ethiopia so long as there is money to be made out of it. And money can be made just as long as consumer countries such as the United States, Britain, France, Germany, and Italy allow the importation of skins. It is no good insisting on certificates of legal export or similar supporting documents, since they can be easily forged or obtained from corrupt Customs officials....I am convinced that the only hope of saving the leopard...and the other big cats of Africa, Asia and South America, is through a complete prohibition on the importation of their skins in any form whatsoever."

J. H. Blower, ex-Chief Game Warden  
Ethiopia, currently Wildlife Conservation  
Adviser, Nepal, 1971

"...the leopard's numbers may have become reduced generally and in some areas critically...steps for its protection should be strengthened....Revised regulations have been submitted...a moratorium should be called on the leopard skin trade."

Brig. Gen. Mabratu Fesseha, Director  
Wild Life Conservation Department  
Imperial Ethiopian Government, 1971

### Ghana

"It is quite definite that the population in Ghana has been drastically reduced, and has been virtually exterminated in some areas....Revised regulations are now being drafted, which...will place leopards on the completely protected list."

Chief Game and Wildlife Officer, 1971

## Kenya

"My survey of the leopard situation in Kenya has shown that there is no doubt whatsoever that heavy poaching and a vast illicit trade in skins are going on, chiefly due to the fantastic prices offered by receivers, and then by the furriers, to satisfy the world demand. This information has been chiefly collected from the most reliable sources, the wardens and from several professional hunters of good repute...in most areas [outside the parks] the poaching is extremely bad and the position is getting steadily worse....Unless the situation is taken in hand immediately one of the country's chief assets will, in due course, cease to exist."

East African Wildlife Society  
Report on Leopards, 1970

"All reports received from wardens, both from national parks and the game department, indicate the situation is serious. In [parts of] the Northern Frontier District of Kenya...large gangs of ex-Shifta [terrorists] are hunting in parties numbering from 20 to 80 persons...one party of 68 persons were equipped with 42 firearms, which included 2 Bren guns and 4 Sten guns....These gangs are, primarily interested in obtaining leopard and cheetah skins....Leopards five years ago were common but now have been systematically exterminated....A recently captured prisoner divulged... a gang had killed more than 300 leopards over a period of 3 months....In the Matthews Range Hunting Block--- there are no leopard at all as they have been poached out of existence, whereas [formerly] they were well represented. In South Turkana, nearly every waterhole has its leopard trap. ...a local dealer pays Sh.800/- [U. S. \$115] for a large leopard skin...[in other areas] poaching is reported as extremely widespread."

East African Wildlife Society  
Report on Poaching, 1970

"We consider all spotted cats in Africa to be endangered, owing to the over-commercialization of their skins....The Game Wardens in the field are unanimous that commercial exploitation of these species has reduced the population, outside the national parks, to near extinction. The highly

organized poaching gangs are now turning their attention towards the national parks, in view of the very high reward available to them from the sale of skins....We therefore ask...that the leopard, the cheetah, the serval and the genet be fully covered [under the act] to disallow importation."

Hon. Charles Njonjo, E.G.H., M.P.  
President East African Wildlife  
Society, 1970

"...I have been active in the wildlife of this country for a number of years--over 40 in fact--and poaching...has now reached proportions which threaten to exterminate cheetah and leopard and some other species....For those persons who are doubtful about the seriousness of the situation, I would like to say that National Parks, Game Departments, the Wild Life Society, and the East African Professional Hunters Association all speak in one voice on this matter....We now have confirmation from wardens that leopards have been completely exterminated in some areas and decimated in others, due entirely to poaching."

S. P. Downey, Nairobi, 1970

#### Mozambique

"...there are many regions where [the leopard] can be considered extinct...it has been appreciably reduced in recent years...more than 1000 leopards are killed annually and their skins smuggled out...implementing laws for protecting the leopard, which on paper are sufficient, presents enormous difficulties...would agree with international support."

Department of Fauna  
Directorate of Veterinary  
Services, 1971

#### Nigeria

"...the several species seem to be so uncommon as to be presently threatened with extinction unless conditions are changed for the better. Among these species are...cheetah...[and] leopard...."

G. A. Petrides, Wildlife and  
National Parks in Nigeria, 1962

## Rhodesia

"Our Department of National Parks and Wildlife Management is very much opposed to the trade in leopard skins....There is no question that the very best way of cutting down on the very large numbers of spotted-cat skins which find their way to dealers in the principle markets of the world is for these countries to control their import, or better still, ban their import....Our National Parks Department is doing a tremendous lot in banning the hunting [of leopards] for recreational purposes."

Mr. G. A. Bakewell, Hon. Secretary  
Zoological Society of Rhodesia, 1971

## Somalia

"Leopard [Panthera pardus] is almost exterminated in the Somali Republic...the Somali Government has passed a new law totally protecting the leopard. Both trading and possession of their skins are also made completely illegal. However, it is not easy to save them because one skin is worth more [than] the average yearly income of a Somali shepherd."

Director General, Ministry of  
Rural Development, 1968

## South Africa

"The leopard has declined definitely and drastically throughout its range in South Africa. The species is now limited in the majority of cases to the large game reserves and the more inaccessible and less developed areas...with the increasing development of the remote parts of South and South West Africa I consider the species in danger of eradication. I would recommend that a world-wide ban on imports is imposed, especially by the United States and the European countries....I consider the species in a precarious state in South Africa.

...outside conservation areas, the leopard is definitely in danger of extermination, especially if one takes into consideration that the remote areas of the country are being opened up more and more. At present the last strongholds of the species outside conservation areas are inaccessible



mountain areas. But as the prey species in most of these areas are rather limited, the leopard is forced into the populated areas where it is relentlessly persecuted. I feel however that the hunting of the species for monetary reasons is quite negligible in South Africa and the export of skins originating in South Africa is minimal. An export ban would not much benefit the species in South Africa unless the authorities would promulgate regulations stopping the indiscriminate hunting of leopards for alleged stock killing by the farming communities. A further complicating factor in assessing the survival of the leopard is whether one would consider a species safe if preserved only in conservation areas. In this sense the leopard would be safe."

W. Von Richter, Survey of Rare and Endangered Animals, Mammal Research Unit, University of Pretoria, 1971

#### South West Africa

"In certain territories very few [leopard] still exist....I agree that this is the time to tackle the problem, and that a moratorium would be of help."

Director of Nature Conservation and Tourism, 1971

#### Sudan

"I am deeply concerned with the status of the leopard which is generally declining....Control of the situation is beyond the capacity of the Sudan Game Department....Internal financing does not cope with...the money-making from game trophies. International funds showed clear hesitation in coming to our aid...the leopard [is] near extinct throughout the Sudan...this process of reduction has been going on for not more than six years when international markets showed inviting prices for the trophy....The number in the local markets goes over five thousand. In my opinion this amount is more

than the resource can provide as an annual harvest....If the time has not already gone, it is high time to take drastic steps both inside and outside Africa to meet the problem."

Mr. Hassan M. Abdel Bagi  
Senior Inspector of Wildlife  
Game and Fisheries Department  
of the Sudan, 1971

### Tanzania

"...faced with the general almost hysterical rush for profit on leopard skins, there is sufficient justification for serious concern."

Director National Parks, 1971

"It would be surprising if numbers of leopard had not decreased in view of...increased illegal hunting due to less efficient control and the greatly increased value of leopard skins....I would agree that the time is...ripe to meet this problem....Although we have not reached a point of crisis in this country, other countries certainly have from what one understands and without international action they may well lose their leopards....We have had some very big commercial poaching operators at work in this country during the last two years....It has become a rough, tough business with people being killed and there has been wholesale bribery and corruption....Leopards are being trapped out of many areas. Because of the high value of the skins, the money to be made from illegal killing of these animals presents such a temptation to poachers that the existing law enforcement agencies will never be able to exercise effective control unless the market in them can be more effectively controlled."

Ex-Director of National Parks,  
1971

## Zambia

"It is impossible to say in general terms whether the leopard as a species is or is not in danger of extermination because its status varies so much from place to place. In some of the countries within its range, it is virtually extinct. The leopard is not extinct or nearly extinct, in most parts of Zambia. I would say that it would be desirable to clamp down on the trade in leopard skins....While this may be too late to allow the recovery of the species in some places it would prevent reduction to the point of no return in others....The ban on skin trade will, without doubt, be effective in this if it is enforced, because no one is going to a lot of trouble to get leopard skins if they can't be sold for a high price on foreign markets. Such a ban on trade in the importing countries is probably the only effective method of protecting the species....I agree with the moratorium on trade.... The sustained-yield idea is theoretically attractive, but until the time comes when effective law enforcement exists throughout the leopard's range, I am convinced that it would not be workable."

Deputy Director, Department of  
Wildlife, Fisheries and National  
Parks, 1971

## Africa in general

"The [leopard] has been reduced, in some cases very greatly, throughout its range in Africa. I know of no good evidence that it has maintained its status, as of say 1960, anywhere outside National Parks. In some areas it has been reduced to near extinction....It is being relentlessly hunted for its skin and has undoubtedly been cropped beyond its reproductive potential....It is unlikely that the leopard will be totally exterminated by the fur fashion; presumably the price will rise to such a level that even the richest women will not buy coats made of leopard skins. However, at that stage the survival of the leopard would be extremely precarious, and perhaps some races would be

exterminated....It is one thing to dismiss the stated opinions of a very large body of responsible naturalists as emotional rubbish; quite another to find out the facts and prepare a positive statement proving that these views are not mere emotional rubbish."

L. H. Brown, Consultant to F.A.O.  
and I.U.C.N., 1971

"A general moratorium on hunting and trade of leopards in Africa [is] badly needed. A United States Federal ban on imports would be immensely helpful....There is no doubt that the heavy drain on leopards, chiefly due to illegal hunting, poisoning and trade, are beginning to have serious effects on the African population as a whole. Local exterminations are known from many countries. On the other hand...in view of the [export] figures it is understandable that the species is not yet down to a critical level, but if the slaughter continues on the present scale, it is very likely that it will soon be endangered."

Dr. Kai Curry-Lindahl, Director,  
UNESCO Office for Ecology and  
Conservation in Africa, 1971

Other published data on the status of the leopard are the following. In Iraq, Hatt (1959) reported that they were very rare, and threatened with local extinction. Howell (1969) says that they are not numerous on the Borgu Game Reserve in Northern Nigeria, and that their numbers would probably increase if poaching was reduced. Hopkins (1970) reports they were extinct in the Olohemeji Forest Reserve in Nigeria by 1937. Harrison (1968) says that in Arabia, leopards are hunted remorselessly and exist only in small numbers. Dalquest (1965) reports that in the Save River area of Mozambique leopards are still uncommon... that they are greatly reduced by native poachers using wire snares, but that their numbers may now be increasing. In the U.S.S.R. Novikov (1956) says that leopards are most common in the far east in the southern parts of the Maritime Territory, and northward to about 50°N. latitude. He also states that their population is small and that they occur in very inaccessible regions. Von Richter, of the University of Pretoria, in a 1971 South African government report on an official mammal survey of the country states: "With increasing human population and the pressure now being directed on remote and undeveloped areas, (the leopard) is most certainly endangered in its survival." Here, however, the threat

involves changing land use and eradication of the leopard as a pest species rather than poaching for the fur trade. Von Richter (in press) states, however, "It is realized that probably only a negligible number of leopard skins that originate in South Africa find their way on the world market, but nevertheless it would remove one incentive for hunting in South Africa, where a poorly cured and tanned leopard skin fetches as much as R500!"

There is virtually no reliable information regarding the status of leopards in Southeast Asia. However, it is reasonable to suppose that extensive habitat changes there, growing population pressure, the war in Vietnam, and poaching (skins exported mainly through Thailand), have taken their toll on leopard populations, and that the species is as threatened as in Africa.

### Numbers

Few estimates of numbers are available for countries or larger areas. Aliev Farman Fatullah (pers. comm., January 1972) states that there are only between 340 and 430 leopards left in the entire U.S.S.R. Myers (in press) provides the following data for several African parks: Kruger Park, 650; Serengeti, 500 to 600, perhaps up to 900 for this ecological unit of 12,000 mi<sup>2</sup>. Kafue Park in Zambia is reckoned to contain somewhere between 400 and 800 leopards. The Ceylon Park of Wilpattu forest country seems to feature leopards at a rate of one to every 14 mi<sup>2</sup> (Eisenberg and Muckenhirn, in press). Myers (in press) also estimates that all parks of eastern and southern Africa probably hold way below 10,000 leopards.

### Game laws (From Division of Management and Enforcement, Bureau of Sport Fisheries and Wildlife)

The following countries have exhibited their concern about the continued survival of the leopard by enacting various laws and other measures: CAMEROON: leopards are a prohibited export; CEYLON: leopards strictly protected by law; CHAD: no leopard export without permit; DAHOMEY: no export of leopards for spotted cat trade allowed; ETHIOPIA: prohibits export of leopard except under special permit; INDIA: no leopards (dead, alive, or parts) may be exported except under special permit; IRAN: hunters may kill only one leopard under license; KENYA: only one leopard under special permit; SOMALIA: leopard officially recognized as an endangered species; TANZANIA: lists leopards as a second schedule protected form.

## Imports and their impact

The Bureau of Tariffs reports the following importations of raw leopard skins into the United States in recent years:

1968.....9,556

1969.....7,934

1970..... 996

Live imports of leopard were (from U. S. Department of the Interior form 3-177):

1968.....6

1969.....9

Obviously the fur trade accounted for virtually the entire leopard importation into the United States in recent years. According to an anonymous article in Oryx (1964) it takes five to seven full sized skins to produce one leopard coat, and 50,000 skins of leopards were being shipped out of Africa at that time yearly to meet the demand for coats. The United States was the biggest buyer, with Britian, France, Germany and Italy close behind.

There is almost nothing known about the leopard's natural history to determine how many leopards can be safely harvested. The I.U.C.N. believes that currently (1971) 10,000 leopards are being taken out of Africa every year on permit. Myers (1971) holds that this is the maximum they can bear while still maintaining their numbers. However, he states that in addition to the 10,000 legally taken, 60,000 are taken illegally each year.

## Remarks

Turnbull-Kemp (1967), one of the most noted authorities on the leopard, points out that the species comes under attack from man for three reasons. He says that the first risk from man is defensive or retaliatory in that leopards can be, and often are, destructive to man's interests in an area. This risk is strictly of an internal nature, and it is the responsibility of the game agencies within the various countries to control it. The second risk to the leopard from man is its destruction for sport. Turnbull-Kemp (1967) strongly doubts that the leopard could ever be brought to the point of extermination through sport hunting. He feels that the final and major threat to the survival of the species is the fur trade. Prices for pelts are high and are a real incentive to trapping, illegal hunting,

and unsporting practices. Such prices are a real threat to the leopard's survival, especially where it is already reduced in numbers. Legislation directed towards the trapper is feasible in theory only, because it is almost impossible to enforce. Turnbull-Kemp (1967) says that it would be far better for the governments to direct their money and efforts toward suppression of unlawful trading in skins and illegal export. Where there is doubt as to the final disposal of skins the dealer or trader will be less inclined to apply his encouragement to the trapper.

Finally, it should be clearly noted that there is not unanimity of opinion with regard to the status of the leopard, and this may be one of the most controversial animals of the group considered herein as endangered. A. D. Graham, of Wildlife Services Ltd., Nairobi, states (pers. comm., December 1971) that: "The current belief by the public in the assumption that spotted cats are declining faster than other wildlife generally seems to be an emotionally based phenomenon akin to rumors." He says that the steady supply of leopard skins is indicative of a large and stable population, yet, he necessarily admits a decline in the leopard population. At this time, however, such statements are not impressive. Mr. Graham's implication that other wildlife in general is declining in East Africa hardly justifies ignoring the plight of the leopard. His statement that the steady supply of leopard skins is indicative of a large and stable population is not necessarily true. It is a well-known fact that when a commodity has high commercial value, hunters will range farther and farther afield in order to supply the demand. It does not necessarily mean that numbers of animals are holding up well in a particular area. John Visser, an African animal dealer, says (pers. comm., December 1971) that the leopard in South Africa is perhaps over-protected. Prey elimination in certain areas has resulted in the species turning up regularly on farms, and occasional attacks on humans have been reported. Mr. Visser's comments, however, are in direct contrast to those of Von Richter (in press) cited earlier.

### Summary

The leopard, although still widespread in distribution, has been extirpated from some areas, and is drastically reduced in numbers elsewhere. This has come about primarily because of over utilization for commercial purposes and modification of habitat. Although there are differences of opinion regarding the true status of this species, most responsible authorities have expressed concern for its survival and regard it as endangered.

## TIGER (Panthera tigris)

### Former distribution

Southeastern Transcaucasia, southern Russian Turkestan, Ussuri region, and middle Amur region of Eastern Siberia, Manchuria, China, Iran, India, and east to Assam and Burma, Malay States, Sumatra, Java, Bali and Korea (Ellerman and Morrison-Scott, 1951).

### Present distribution

The I.U.C.N. "Red Data Book" gives ample documentation for the decline of the tiger in most areas. Singh (in press) adds the following information: In Iran, there are less than 20 left; in Afghanistan, probably no more than a dozen; West Pakistan, a very depleted number; southern Russia, to the shore of the Caspian, present numbers 60 to 70 (Aliev Farman Fatullah pers. comm., January 1972 estimates there are no more than 120 to 140 tigers left in the entire U.S.S.R.); northeastern China and northern Korea, 60 to 70; southern Korea, about 50. For China and East Pakistan, there are no figures, but tiger populations have been greatly reduced. There are also no numbers available for Burma, Malaysia, Thailand, Cambodia, North or South Vietnam, but certainly the war in the latter three countries must have taken a large toll. Singh (in press) says that there are no estimates for Sumatra but that it is known that the situation has seriously deteriorated. He says that there are no more than 20 to 25 tigers left on the entire island of Java, and on Bali it is perhaps extinct. In Nepal, where once the tiger was extremely abundant, widespread habitat disruption has occurred in recent years. Extensive tracts of virgin timber have been cut over, and the countryside has been colonized. Singh (in press) states that it is unlikely now that the tiger exists in Nepal to any large extent except in Kanchanpur-Kailali and Chitawan.

India has always been the primary stronghold of the tiger, but reliable authorities report that the situation has deteriorated to the emergency point. In a roundtable discussion at the International Symposium on the World's Cats in March 1971, K. S. Sankhala stated that "Hunting in the Indian forests has contributed to a decline of the tiger from 40,000 to 2,000." Dr. John Eisenberg, Resident Scientist at the National Zoological Park, who is well acquainted with the mammal fauna of Ceylon and is in accord with Sankhala. Eisenberg stated (pers. comm., November 1971) that the situation for the tiger in south India is critical, and that they will be a "wash-out" within the next ten years. Most of the remaining tigers in India are found in the north portion of the country; fewer than 400 tigers remain in south India. Eisenberg considers the tiger to be one of the world's most threatened species of wild cat.



Other miscellaneous published statements on the status and distribution of the tiger are the following. Masak (1967) says that the tiger is decidedly rare and local in the U.S.S.R. and Korea. Daniel (1970) states: "The tiger should be considered in danger of extinction and should be protected (from) shooting and the poisoning of its kills....There needs to be an effort on conserving its food species as well."

#### Game laws

No tiger can be exported, dead, alive, or parts (skins) from India, except that in exceptional circumstances an application can be made to authorities who will consider it upon consultation with scientific personnel. Singh (in press) points out, however, that Nepal poses a direct threat to the effectiveness of India's ban. The long border of 800 miles between these two countries is almost entirely uncontrolled by any effective checkpost, and Indian citizens do not need a passport for entry. Thus it is an easy matter to remove tiger skins from India and export them from Nepal.

Pakistan prohibits the export of tigers except under permit based upon fixed quotas.

#### Imports and their impact

The Bureau of Tariffs lists no raw tiger skins imported into the United States in 1968-70. An examination of U. S. Department of the Interior forms 3-177 for the latter six months of 1970 shows that one tiger skin rug was imported into the United States during that period. Undoubtedly in years past numerous tiger skin rugs, coats and trim were imported here but were not reported to the Bureau of Tariffs because they were already tanned when shipped. Also the U. S. Department of the Interior form 3-177 did not require products to be listed until very recently.

Singh (in press) attributes the main causes of the disappearance of the tiger from much of its former range to massive destruction of habitat and the uninhibited demand for skins both as trophy material and by international furriers for the manufacture of rugs and coats. J. A. Pollon, President of the Southern California Safari Club (a hunter-conservation group) stated in a roundtable discussion at the International Symposium on the World's Cats that in recent years "...poachers are really going to town and the illegal skin trade has increased its take to a new all time high. Dozens of tiger skins leave India every month, most of them from poisoned animals."

## Remarks

The I.U.C.N. has deemed a five year moratorium on all killing, a necessary period in which to halt the present decline of the tiger.

## Summary

All available data and opinions indicate that the tiger is on the decline everywhere, and that it is an endangered species. Primary reasons for the decline are an increase in poaching for hides and massive deterioration of habitat.

## SNOW LEOPARD (Panthera uncia)

The I.U.C.N. lists this species as endangered, and has adequate justification for doing so. For the sake of completeness of this report, the following summary was abstracted from the I.U.C.N. data sheet.

### Former distribution

The mountains of central Asia, and southern Siberia. In the U.S.S.R. it is encountered in most mountain ranges of Tadzhikistan, and in the mountain systems of Tian Shan, Chatkal, Talass Alatau, Kirgizia, Trans-Ili, Dzungarian Alatau, Tarbagatai, and Saur, and is rarely but regularly seen in various parts of the Altai and in the Tuva Autonomous Region. In China, the species occurs around the mountainous periphery of Sinkiang, in the Pamirs and the Astin Tagh. The range extends across the Tibetan Plateau to the northeastern part of Tsinghai Province, and reaches into extreme western Szechwan. In India, the range includes the entire Himalayan chain from Kashmir to Sikkim; in Pakistan, Gilgit, Hunza, and Nagar, into the Karakoram Range. In Afghanistan, the snow leopard is found in the Hindu Kush. (Novikov, 1956; Shou, 1962; Prater, 1965; Dang, 1967).

### Present distribution

About the same as former distribution; the species is endangered because of reduced numbers, not because of a reduction in over-all range.

## Status

U.S.S.R.: An indication of its rarity is that from 1961-64 numbers taken varied from 2 to 5 dozen annually; the population is sharply decreasing. So rare in Kazakhstan that it is not even mentioned in the hunting regulations. At the international fur auction held in Leningrad in July 1967 only 10 pelts were on offer, and all were purchased by a Lebanese firm for U.S., \$175 each. (I.U.C.N. Red Data Book, January 1970). Aliev Farman Fatullah (pers. comm., January 1972) estimates that there are only 1800 to 1900 snow leopards in the U.S.S.R.

China: No census has yet been attempted, but to judge from the number of skins and captures of living animals the population cannot be large. (Shou, 1962).

Mongolia: Very rare and not protected (I.U.C.N. Red Data Book). Despite the lack of sympathy shown any predator, the total annual kill is only about 40 to 50. (Hibbert, 1967).

India: Reliable data are lacking, but the species appears to be uncommon to rare throughout the Himalayan sector of the range. (Dang, 1967).

Pakistan: Survival severely threatened by skin trade (I.U.C.N. Red Data Book).

Afghanistan: Unknown, but because the range is very small, the numbers are certain to be low. (I.U.C.N. Red Data Book).

## Numbers

A very rough working estimate for the Himalayan complex of mountain ranges is in the region of 400, give or take 200 (Dang, 1967). It is unlikely that the Himalayan population exceeds 250 (I.U.C.N. Red Data Book). Prater (1965) states that the reason for the snow leopard's decline is that it is persistently sought after and hunted for its valuable fur.

## Imports and their impact

The Bureau of Tariffs does not have a category for snow leopard. Undoubtedly some of the 18,486 "leopard" skins listed as imported between 1968 and 1970 were actually snow leopard, but it is impossible to be certain how many. Ten live snow leopards were imported into the U. S. in 1968 and 1969 according to U. S. Department of the Interior forms 3-177.

## Remarks

Indra Kumar Sharma (pers. comm., November 1971) states that snow leopards are decreasing in numbers in India. This species, along with several other wild cats, is now strictly protected by the Indian Government.

## Summary

All evidence indicates that this species is greatly depleted in numbers through hunting and poaching for pelts, and is endangered because of over utilization for these commercial purposes.

## JAGUAR (Panthera onca)

### Former distribution

Found at lower altitudes from the Grand Canyon, Arizona, southern New Mexico, and central Texas, south to the Parana Valley of central Argentina.

### Present distribution

Virtually gone from the former range in the United States (Taylor and Davis, 1947; Cockrum, 1960). Still widely distributed throughout Central and South America. It is the growing reports of increasing scarcity, and the enormous trade in jaguar pelts that leads to the conclusion that the species is endangered, rather than any reduction in over-all range.

### Status with comments on the fur trade

Leopold (1959), before the current craze for jaguar pelts peaked, commented that jaguars had become scarce or were exterminated in the more highly developed sections of the tropical lowlands of Mexico. He felt, however, that they were holding on well in the wilder regions. Roy McBride, of the Bureau of Sport Fisheries and Wildlife's Division of Wildlife Research Field Station in San Antonio, Texas, says (pers. comm., November 1971) that in areas of Mexico where he has hunted and formerly found jaguars, they no longer occur. Chris Vaughan, of the Costa Rican Department of National Parks, reports (pers. comm., December 1971) that "...I feel the sooner the ban on importation of wild cat pelts (incl. jaguar) the better. Many people in the field (in Costa Rica) are talking about the scarcity of cats in their areas." Handley (1966) says that jaguars are uncommon in Panama. He further has expressed (pers. comm., November 1971) his concern about jaguars not only in Panama but elsewhere in Central and South America where he

has worked. Richard G. Van Gelder, Curator of Mammals, American Museum of Natural History, reports (pers. comm., November 1971) the same concern. On none of his recent field expeditions to Central and South America was he able to locate a jaguar or jaguar sign. John Eisenberg of the National Zoological Park (pers. comm., November 1971) expresses similar concern. He feels that the cats of South America, particularly the jaguar, are more endangered than those of Africa or Asia, because throughout the entire region there is no effective national park system to shelter populations. Grimwood (1969) reports that in Peru "The jaguar has long been persecuted for its valuable skin, for which local merchants were paying \$1,700 each in 1966. As a result, it has disappeared from the neighborhood of all settlements and is now rare in many parts of its range." El Salvador reports that jaguars are extinct in that country (from files of Division of Management and Enforcement, Bureau of Sport Fisheries and Wildlife).

Hornocker (1970), in a World Wildlife Fund Survey, stated: "It is extremely difficult, at best, to determine population status of the jaguar throughout its varied habitat. The animal is highly secretive, largely nocturnal, and it frequents dense cover. As a result there is much misinformation and exaggeration concerning its abundance or lack of abundance. But signs of the present status exist, and while populations vary within each country, most indications are that jaguar numbers are declining....

"There are numerous factors responsible for declining numbers of jaguar. Hunting is perhaps the foremost. Most jaguars are killed for their skins - the United States official import was 7,758 jaguar skins for 1970 alone. Livestock owners destroy them at every opportunity, and as Latin American countries develop this will become more of a problem. Sport hunting exerts varying pressure from country to country, but is particularly important in parts of Central America, where U. S. operators have reportedly depleted populations in some areas.

"The spread of agricultural practices and the development of road systems have contributed to the diminished status of jaguar populations throughout Latin America. This is particularly true in Mexico, Venezuela, Brazil, and central Paraguay. These problems, coupled with the lack of effective conservation practices, promise to become more urgent in the survival of jaguars in the future.

"On the whole, the results of this survey broadly support the apprehension that the jaguar, throughout its range, is subjected to over-exploitation and has suffered major reductions in its distribution and numbers. Further, it seems likely that over-exploitation will continue for some time in these developing countries, as will habitat encroachment.

"The jaguar is not at present in danger of extinction. In view of its decline in numbers from the past, however, and considering the accelerated pace of development throughout Latin America, steps should be taken immediately to insure the species' continued existence."

In November of 1970, Norman Myers contacted government officials and other authorities in the Amazon region concerning the jaguar (and other spotted cats), their status, trade trends, action being taken to promote conservation, and advisability of an overseas moratorium. The following are the responses to his inquiries (Myers, in press):

#### Brazil

"I think there is no doubt about the necessity of forbidding the import of skins of jaguar and ocelot into the U. S. As far as I know, the pressure on jaguars is still bearable, but ocelots are easier to kill and in greater danger. However, no animal species in the world may resist the high prices paid for skins by the international fur trade.... if a man can earn with a single shot more than he receives in 3 or 4 months of work."

Dr. P. Mogueiro-Neto, University  
of Sao Paulo, and member of  
Executive Board, I.U.C.N., 1971

"I have been working more or less steadily in Amazonia for the past 25 years....A hunter will work a new area in about 6 months. An average season's catch is 18-20 ocelots and 1-2 jaguars....All areas, I know, are feeling the weight of the intensive hunt of the last years."

Dr. P. E. Vanzolini, Director  
Museum of Zoology, University of  
Sao Paulo, 1971

#### Colombia

"Jaguars and ocelots have become very scarce in many areas....I am very much in favour to protect the spotted cats immediately and to start an international moratorium, since there are already enough data to prove they are endangered."

Dr. Frederico Medem, Director  
Instituto Roberto Franco,  
Villavicencio, Amazonas, 1971

"...there is...a grave problem of survival for the spotted cats--in some areas these species are on the verge of extinction [after] the price has risen ten times in the last ten years...[but] these countries are not receiving the full benefit from the export of their wildlife since most is done illegally, i.e. smuggled out."

Dr. F. C. Lehmann, Director General  
Cali Natural History Museum, 1971

### Mexico

"...there is a great decline in populations of the large Felidae...partly due to trade in skins legal and illegal, partly to disruptions to the habitat for agriculture and forestry...a problem caused by demographic factors....I recommend a ban on the sale of skins, here and overseas."

Dr. B. Villa, Chairman, Department  
of Zoology, University of Mexico,  
1971

### Peru

"...it seems most unlikely that the rate of [jaguar] offtake can be sustained....It is impossible for the [ocelot] to withstand indefinitely a drain of this nature on its population....The high offtake can have been maintained only by the decimation of the populations in new areas every year."

Grimwood, 1969

"The jaguar and ocelot are much hunted for their skins...by persons whose sole activity it is to supply the trade....The legislation of November 1970 should, we hope, give positive results, provided that neighboring countries to Peru implement similar methods and the consumer nations impose on themselves a ban on these products while the trade prohibition here is in force."

Director General, National  
Planning Office for Natural  
Resources, Lima, 1971

"...a lot of contraband goes on in the skin trade.... The extent is greater than expected, since some skins are shipped to Colombia and Bolivia as contraband... [and] the extent of the territory is so great that it is impossible to control....The number of animals in the Amazon area is greatly reduced...hunters have to travel hundreds of miles to trap them....Consumer nations must collaborate and respect our laws....I can assure you the jaguar is in endangered status all over the Latin American jungle."

Dr. Felipe Benavides, President  
Zoological Association of Peru,  
and I.U.C.N. Trustee, 1971

"There is no doubt that the increase in the fur industry's demands overseas has produced an intensification of the decline of jaguars and ocelots... hunters must now travel far greater distances than formerly....In November 1970 we passed much stronger legislation which forbids trade in jaguar skins and will try to place severe restrictions on ocelot exports."

Director-General for Forestry and  
Game, Ministry of Agriculture,  
Lima, 1971

### Numbers

There are no reliable estimates of numbers available on jaguars from anywhere within its range.

### Game laws

Ecuador has prohibited the export of all wild animals (including jaguar) for a period of five years from July 1969; Guyana strictly prohibits the killing of jaguars and the export of jaguar skins; Mexico has no open season on jaguars and does not allow exportation of skins; Uruguay does not allow skins of spotted cats to be exported... in addition they do not allow spotted cat skins to be imported into the country; Venezuela prohibits the exportation of jaguar pelts; Costa Rica does not allow exportation of wild animals (including jaguar) except under special permits to zoos. Brazil has forbidden the export of jaguar skins and live jaguar can be exported for scientific purposes only.



Laws against exporting spotted cat skins from the various countries listed above have had little effect on the spotted cat skin trade. Chris Vaughan (pers. comm., December 1971) gives a good example of how illegal poaching is conducted in Costa Rica. He says: "Tomorrow I leave for a town by the Nicaraguan border where furs leave Costa Rica illegally for Nicaragua and animals are allegedly brought into the country and shipped to the dealer en transito. It is against Costa Rican law to ship out Costa Rican animals except under special permits to zoos, so this dealer takes Costa Rican animals from that area, says that they are from Nicaragua (who signs the permit I hope to find out) and then re-exports them. And, somehow he got an official to sign a paper saying he has several thousand more animals than he really has, so he can export Costa Rican animals under the auspices of 'en transito' animals." This type of illegal trade is well documented in Central and South America, Africa, and Asia, and indicates the futility of unilateral action in preventing the exploitation of wildlife.

### Imports and their impact

Myers (1971) says that about 70 percent of the jaguar skins exported from Central and South America arrive in the United States. The Bureau of Tariffs lists imports of raw jaguar pelts into the United States as follows:

1968.....13,516

1969..... 9,831

1970..... 7,758

In addition to the above, 11 live jaguars were declared and imported into the United States in 1968, and 26 in 1969 according to declarations on U. S. Department of the Interior forms 3-177.

There is virtually nothing known about the population dynamics of jaguars, and hence it cannot be determined how many can be safely harvested each year. Many biologists have grave doubts whether any large carnivore, with a possible need of 150 square miles of range per animal (Doughty and Myers, 1971), can withstand the massive harvest indicated above. Grimwood (1969) points out that 12,704 jaguars were exported from Iquitos, Peru, during the period 1946-1966. He says that "...it seems most unlikely that that rate of offtake can be sustained." Myers (1971) says that Peru's total export of jaguar skins clears out the best part of 80,000 mi<sup>2</sup> each year.

A good indicator that jaguars are being over-exploited is that the size of pelts has been decreasing. Myers (in press) states that this was confirmed for him by dealers at several different points in the Amazon while he examined random piles of skins in warehouses in 1970. This possibly suggests that the adults are being removed from the population faster than they can be replaced.

### Summary

Numerous respected scientists, who are familiar with the jaguar and the countries it inhabits, have stated their opinion that the species is becoming scarce. This has been attested to by government authorities in a number of South American countries. A staggering number of jaguar pelts have been imported into or transported through the United States in recent years, and it is believed the scarcity of jaguars results primarily from this exploitation. There is evidence that pelts being exported are smaller in size than in former years, a possible biological indicator of over-exploitation. Because of widespread illegal poaching, national laws prohibiting the hunting or exportation of skins have been ineffective in protecting the jaguar.

This species is considered endangered because of over utilization for commercial purposes, the inadequacy of existing regulatory mechanisms, and the destruction of essential habitat.

SMALL NEOTROPICAL SPOTTED CATS: Ocelot (Felis pardalis),

Margay (Felis wiedii) and Tiger Cat (Felis tigrina)

These cats have similar distributions, and are very similar in appearances and difficult to distinguish. They are being heavily exploited, and have similar survival problems. Most citations pertaining to them simply lump them all together as spotted cats, or refer to them under the name "ocelot." Much of the data pertains to all three equally well, and in the interest of brevity and nonrepetitiveness, the three are lumped into this single account.

### Distribution

The ocelot (F. pardalis) is distributed from the extreme southern U. S. to Ecuador and northern Argentina; the margay (F. wiedii) has occurred from the southern U. S. (one specimen taken in Texas) to southern Brazil and Bolivia; the tiger cat (F. tigrina) is more restricted in range, occurring from Costa Rica to northern South America.

## Status

These small spotted cats are being exposed to widespread and seemingly uncontrolled mortality through the skin trade. Numerous responsible scientists and game authorities have expressed their doubts that they can withstand continued exploitation at the current rate.

## Comments on the skin trade

Grimwood (1969) states: "The ocelot is relentlessly hunted for its valuable pelt, for which S/700 each was paid by Iquitos and Pacallpa merchants in 1966. Dr. Alfred Gardner informed me that during his three month stay on the Rio Curanja no less than 40 to 50 of these animals were trapped by the inhabitants of a single Indian village and that traders visited the area buying skins each month. Over 138,000 ocelot skins have been exported from Iquitos during the past 20 years....The ocelot is undoubtedly one of the most successful forms of mammalian life in the Amazon region, and is often more plentiful than the availability of prey species would appear to make possible. It is, however, impossible for the species to withstand indefinitely a drain of that nature on its population. The species has not been entirely eradicated from all areas of settlement, but... the high offtake can have been maintained only by the decimation of the population in new areas every year. Control of hunting, and particularly of the trade in skins, is therefore necessary."

Of the margay, Grimwood (1969) says: "Attempts are often made to sell traders skins of this cat as those of ocelots, by cutting off the last few inches of the tail. Experienced buyers, however, can detect the slight difference in texture of the fur despite the almost identical color and markings of the two species. Up to 1961, the pelts of Felis wiedii had no commercial value, but exports since then have been growing rapidly....I have been able to learn nothing of the distribution of this species from the skins I have seen in hands of the dealers, because their place of origin is usually unknown. The status of the species is also equally obscure, although it is everywhere regarded as being uncommon. Control of hunting, and of the trade in skins, is necessary less the species become endangered."

Grimwood (1969) also states that there are no definite records of the tiger cat (F. tigrina) from Peru but that it can be expected to occur in the Amazon region, where it could be confused with F. wiedii, "from which its skin is almost indistinguishable."

These small spotted cats are a most important source of income for the natives. As pointed out by Grimwood (1969), an ocelot skin could bring as much as \$25.00 in 1966. It would certainly be advantageous to these people to maintain their source of income. Yet they do not seem to be aware of this. Grimwood commented on the

necessity for hunters to travel further afield into new areas each year to obtain skins. Myers (in press) comments further that the local people, far from exploiting a splendid and sustainable source of income, are literally cutting their own throats. Hunters have confirmed for him that they are having to travel further to obtain fresh supplies of pelts.

Doughty and Myers (1971) point out that in Brazil they could buy jaguar and ocelot skins at curio shops without the need of export permits. Margays and tiger cats were also on sale. They say that exports of small spotted cat skins have increased eighteenfold between 1960 and 1969, and that about a quarter of the skins are now shipped to the United States. In addition to hunting and trapping pressure on small spotted cats in Brazil, essential habitat is rapidly being destroyed; new roads, new cities and camps, logging and a slash and burn agriculture are having their effect.

Under the account of the jaguar there appears a series of comments from game officials and other authorities in Amazon countries regarding the status of the jaguar. Every one of these also mentions the plight of the small spotted cats (or as most term them, "ocelots").

#### Imports

The Bureau of Tariffs reports the following imports of ocelots (no other small spotted cats are distinguished) into the United States for the past few years:

1968.....	128,966
1969.....	133,069
1970.....	87,645
TOTAL	<u>349,680</u>

If we assume that Myers is correct in stating that the U. S. imports about a quarter of the small spotted cat skins exported by South and Central America, we can see that nearly 1,400,000 small spotted cat skins were exported throughout the world in the three year period. Some biologists are convinced that these species (lumped in the category of "ocelot") cannot sustain this degree of exploitation. As proof that margay and tiger cats, as well as ocelots, are being exploited for the skin trade, we cite U. S. Department of the Interior figures (from form 3-177) for imports during 1970 (live animals for entire year, parts only for latter six months):

Ocelots ..... 27,996  
Margays ..... 6,701  
Tiger Cats ..... 3,170  
Spotted Cats ..... 19,038  
(no species designated)

Brazil and Colombia supplied the greatest number of spotted cat exports for 1968-70, but virtually every country in which spotted cats occur were represented, despite the fact that some have stringent laws against such exportations. At the present time, Brazil, Argentina, Ecuador, Venezuela, and Mexico have cut off the export of ocelot. Bolivia, Columbia, Guyana, Guatemala and Paraguay allow exports under permit.

### Summary

There is near unanimity of opinion regarding a decline in the numbers of small spotted cats (ocelots, margays and tiger cats) due to excessive exploitation by the fur trade. Fur import statistics are alarming. The three species are endangered because of over utilization for commercial purposes and the inadequacy of existing regulatory mechanisms.

## Species of Felidae Not Considered Endangered at this Time

It is just as important to give reasons for not considering some species to be endangered as it is to document the contention that others are. The following is a list of species not considered endangered at this time, along with a brief resume of the reasons. Ranges are from Denis (1964).

CLOUDED LEOPARD (Neofelis nebulosa). Northern India, southern China, Burma, Malaya, Southeast Asia, Formosa, Sumatra, Borneo.

This species is listed as an endangered form in the New York State Mason Act. It has one of the most beautiful pelts of any cat, and is probably being exploited to some extent. However, there is virtually no one with first hand knowledge about it, and there is little information in the literature that indicates that it might be in trouble (with the exception of the Formosan race N. n. brachyurus which is recognized as an endangered form). The clouded leopard is a nocturnal, secretive animal that inhabits the densest, most inaccessible areas. For this reason, it is rarely seen, and very seldom taken. Boorer (1970) says: "Ever since being discovered in 1821, these animals seem to have been rather rare, or at least to have been seen rarely. Perhaps they are not uncommon in certain places, but of all the cats of Asia, clouded leopards are found in the thickest jungles. As they are great climbers and spend most of their time in the leafy seclusion of the branches, they must often remain unseen." Harper (1945) states that F. N. Chasen (the noted authority of southeast Asia mammals) wrote to him that in his opinion, Neofelis in Malaya was not a vanishing form. He stated that it is rare, but that in a country covered with jungle it is difficult to estimate their status. Chasen also stated that Neofelis was not hunted (in the 1930's). Harrison (1966) says that in Malaya the clouded leopard is confined to deeper forest than the other large cats. He claims that it is often to be seen in trees and will catch monkeys. Burgess (1961) says that in North Borneo the clouded leopard has been recorded on several occasions at Kalabakan near Tawau. He claims that it is a forest dweller and in no danger of becoming extinct. W. P. Macveigh (pers. comm., November 1971) writes: "To my knowledge, there is very little trading in feline skins originating in Malaya or Sumatra. There is only one taxidermist exporting from Medan (north Sumatra) who obtains his stock from quite a large territory yet in a three month period obtained only one F. marmorata, one N. nebulosa, 22 F. planiceps, 3 tigers, and approximately 40 F. bengalensis (common and inhabiting secondary jungle, and over-grown cultivation). I would not say that this is due to any recent scarcity of these cats, except perhaps in the case of the tigers, but results from a lack of interest by native hunters in pursuing jungle species

which are almost impossible to locate." Sharma (pers. comm., November 1971) writes: "Clouded leopard, marbled cat, etc., are not really endangered animals (in India) as these are declared protected animals. These cats are a nuisance to the inhabitants of the area as they have become small cattle lifters."

In summary, good evidence of a decline in clouded leopard populations is not available, nor is there much evidence of massive exploitation for the skin trade. The Bureau of Tariffs does not have a category for clouded leopard, and presumably if they are being imported as raw skins they are lumped along with leopards; there is no way of determining this. U.S.D.I. forms 1-377 list species imported in more precise terms than does the Bureau of Tariffs. For 1970 (entire year for live animals; latter six months only for parts) there are no clouded leopards listed on these forms. Thus, there is no evidence that there is much exploitation of this species.

LYNX (Lynx lynx). Europe, across Asia (including Asia Minor); and in North America to northern U. S.

This species is being commercially exploited. Novikov (1956) says that in the U.S.S.R., the lynx possesses quite a valuable pelt, but it is prepared in small numbers and plays a minor role in the fur trade. In the United States, over 1500 lynx were harvested in 1968, primarily in Alaska, and they sold for as high as \$35.00 per pelt. The lynx, however, differs from the spotted cats that are endangered in that much more is known of its biology. It has been the subject of a number of studies, and there are good data on population dynamics. Berrie (in press) says that presently the lynx population in Alaska may not be overexploited by commercial trapping. He warns, however, that the future may not be as optimistic. Mineral and oil development, increased populations, and the advent of snowmobiles may all have a very adverse effect on the lynx. This is clearly a species that should be closely watched, but at present it may be considered safe. The Spanish race (L. l. pardina), however, is endangered and is listed (as a full species under the name Felis pardina) in the United States' List of Endangered Foreign Fish and Wildlife.

CARACAL (Lynx caracal). Africa, Arabia, northeast to Turkestan, Afghanistan, and northwestern India.

Novikov (1956) says that the caracal is "without commercial value." Von Richter (in press) states: "The species is not in danger of becoming exterminated (in South Africa)." Smithers (1966) says that the caracal is widespread in Zambia, sparse in Malawi and widely but sparsely distributed in Rhodesia. Howell (1969) states that the caracal is probably slowly increasing on the Borgu Game Reserve in northern Nigeria. Hatt (1959) lists the species as rare, but not

endangered in Iraq. Harrison (1968) says that the caracal is not uncommon in the Dead Sea region of Jordan and Israel. Gaillard (1969) found that they occurred throughout southern Senegal, and were conspicuous in Niokolohoba National Park.

AFRICAN GOLDEN CAT (Felis aurata). Tropical Africa.

There is no evidence of commercial exploitation. Although Denis (1964) places this species in his conservation category D for the most endangered cats, there is little or no documentation for this. He says only that: "The golden cat is reputed to be a merciless killer; it is apt to raid poultry and is known as the 'leopard's brother' to the tribes of the Liberian interior. It is now very rare in Kenya, and I have yet to see it alive in the wild." Boorer (1970) says that it is rare, and maps its distribution only in west Africa. Gaillard (1969) reported that it is rare in Senegal. None of this, however, implies endangered status.

ANDEAN CAT (Felis jacobita). Mountains of Peru, Bolivia, Chile and Argentina.

Almost nothing is known of the distribution, habits and status of this species. Grimwood (1969) says: "There appears no reason to suppose that this species is any more adversely affected by man than is Felis colocolo." It is apparently much rarer and has a more limited range, and thus may be more vulnerable. There is no evidence of commercial exploitation now, but the species should be closely watched.

SERVAL (Felis serval). Throughout Africa.

No evidence of commercial exploitation. Von Richter (in press) says that in South Africa "it has generally declined in numbers and its range has been reduced by human activities, notably trapping, as an alleged threat to fowl and small livestock. The serval is to be found in all the major conservation areas in its range. Outside conservation areas it is not common but there is no immediate threat to its survival." Ansell (1960) lists servals as "common everywhere." York (1971) implies that servals are quite common in Kenya. In addition, he says "although apparently numerous in many parts of Africa, with a habitat ranging from sea level to 10,000 feet, encompassing all kinds of terrain and cover, servals are not too often seen." Smithers (1966) lists the species as widespread and relatively common in Rhodesia, Zambia and Malawi. The Barbary serval (F. s. constantina) is presently on the U. S. list of endangered foreign wildlife. Seemingly, other populations of the serval are safe at this time, but should be watched closely. The pelt, although coarse, is beautifully spotted and might make a substitute for those of spotted cats listed as endangered.



IRIOMOTE JUNGLE CAT (Mayailurus iriomotus). Iriomote Island, Ryukyu Islands.

Virtually nothing is known about this recently described cat. Leyhausen (pers. comm., December 1971) states that the population is "...certainly below 300 animals at the moment and in dire need of complete and efficient protection." The Cat Specialist Group of the I.U.C.N. plans to sponsor studies on the Iriomote cat (I.U.C.N. Survival Service Commission Newsletter, January 1971).

LION (Panthera leo). Tropical and South Africa and India (Gir Forest only).

The Indian population of this species (P. l. persica) is endangered, and is on the United States' List of Endangered Foreign Fish and Wildlife. There are only 177 of them left, and they are protected by the Indian Government on the Gir Wildlife Sanctuary in Gunjarat State. In Africa, lions are still widespread in distribution, and in some places are abundant (Denis, 1964; Guggisburg, 1963). In addition, they are offered refuge by the excellent national park systems in various countries. Von Richter (in press) says that in 1964, there were more than 1100 in Kruger Park alone. There are also good populations in Tsavo, Nairobi, Bouma and Damongo National Parks, and on the Ambroseli, Mara, Marsabit, and Wankie Reserves (Guggisburg, 1963). Most important, lions are not being commercially exploited. At this time the lion apparently is in safe condition.

PUMA (Felis concolor). Western Canada to Patagonia.

This species is widespread in distribution, and, in some places common. Although it has been extirpated in much of the settled portions of North America, it still persists in the wilder regions of much of the New World. Grimwood (1969) says of the puma in South America: "This species shows a remarkable ability to adapt itself to habitats as different as the arid, rocky, western slopes of the Andes; the bleak and freezing regions of the puma and cordilleras; and the tropical forests of the low selva. It is everywhere notorious as a stock killer, but it is difficult to hunt and tenacious of existence. Although numbers are usually small, it has not been eradicated from any parts of its range. Its skin has no commercial value. Despite its apparently satisfactory status, control of hunting is desirable." Denis (1964) places the puma in his conservation category A, for safest species.

The subspecies from the southeastern United States, F. c. coryi, however, is endangered and is on the Bureau's list of species endangered within this country. The eastern subspecies, F. c. cougar, has been listed as extinct. However, there have been several recent reports of puma within the range of this form and it is possible that it survives in the wilder regions of the eastern United States.

EUROPEAN WILDCAT (Felis sylvestris). Spain to Caucasus and Asia Minor.

No commercial exploitation. Widespread across Europe into western Asia, although it has been extirpated in many areas (Boorer, 1970; Gaston, 1963; Remy and Condé, 1962). Increasing in Scotland (Denis, 1964).

AFRICAN WILDCAT (Felis libyca). North Africa to Turkestan and India.

Little or no commercial exploitation. Still widespread in distribution; in some areas very common (Brynard and Pienaar, 1960; Ansell, 1960; Talbot, 1960; Denis, 1964).

SAND CAT (Felis margarita). Deserts of North Africa, Arabia, and Turkestan.

No commercial exploitation. Rare and almost nothing known of its habits. Probably has always been rare.

CHINESE DESERT CAT (Felis bieti). Deserts of Mongolia, Kansu, and Szechwan.

Rare and virtually nothing known of its habits. No evidence of commercial exploitation.

BLACK-FOOTED CAT (Felis nigripes). Karroo and Kalahari Deserts.

No evidence of commercial exploitation. Rare and reduced in range, but Von Richter (in press) says that in South Africa it has been reported from all conservation areas in its range, and the survival of the species "seems to be safeguarded."

JUNGLE CAT (Felis chaus). Egypt east to India, W. China, S.E. Asia, and Ceylon.

Little or no commercial value. Denis (1964) places it in his conservation category A, in safest condition. It has a very wide distribution and is common in some places (Novikov, 1956). Harrison (1968) says that in Arabia, the jungle cat is in no danger, although its habitat is being depleted. De Alwis (1971) says that in Ceylon: "...this cat now occupies areas well outside its original habitat...."

PALLAS'S CAT (Felis manul). Asian U.S.S.R., Afghanistan, Baluchistan, Kashmir, Tibet, and Western China.

Value of fur "slight" (Novikov, 1956). Almost nothing is known about this cat. Novikov says that they are frequently encountered south of the Aral Sea, and obtained yearly in quite large numbers. Also, "not uncommon in northern Kyzyl Kum, in Kyzyl Orda Region."

BOBCAT (Lynx rufus). Southern Canada, United States, and Mexico.

The bobcat is essentially a United States mammal, and here it is heavily harvested. In 1968, over 10,000 of them were trapped for the fur trade. This species has been extensively studied and a great deal is known about its population dynamics and harvest potential. The species is still widespread and abundant in places. Individuals even wander into Washington, D. C., on occasion (Paradiso, 1969). In Mexico, Leopold (1959) says, that the bobcat has adjusted well to conditions of land settlement. He says that the bobcat maintains itself in large numbers in northern Mexico. Apparently it is in safe condition at this time.

MARBLED CAT (Felis marmorata). Northeastern India, Nepal, Burma, to southeast Asia, Sumatra, and Borneo.

This is a beautifully patterned cat, but there is no evidence that it is being exploited for the fur trade. Macveigh (pers. comm., November 1971) reports that very little trapping for the fur trade goes on in Malaya or Sumatra. He does not believe that the marbled cat (along with all the other cats of that region, except the tiger) is in any trouble. This cat has always been regarded as rare, but Macveigh points out that its apparent rarity may actually reflect only that it is nocturnal and secretive and inhabits the most inaccessible areas. Nothing is known of its habits in the wild.

TEMMINCK'S CAT (Felis temmincki). Southeast Asia mainland and on Sumatra.

No evidence of commercial exploitation. Nothing known about habits or status.

LEOPARD CAT (Felis bengalensis). Southern China and India, throughout southeast Asia.

This cat is being exploited commercially, but in relatively small numbers and mostly for the pet trade rather than the fur market. It is widespread in distribution, and from all evidence it seems abundant in many areas. Macveigh (pers. comm.) says that it is common in Malaya and on Sumatra. Harrison (1966) states that this is the commonest wildcat on the Malay Peninsula and that it occurs in the vicinity of Singapore. Harrison (1964) considers the leopard cat to be the commonest cat in Sabah. This species cannot be considered in any danger at this time.

RUSTY SPOTTED CAT (Felis rubiginosa). India and Ceylon.

No record of commercial exploitation. Nothing known of habits or status.

FISHING CAT (Felis viverrina). India, Ceylon, Malaya, Java, Sumatra.

No record of commercial exploitation. De Alwis (1971) says that this species is scattered all over the island of Ceylon, except for the arid regions of the north. Nothing else is available on the status of this cat.

FLAT-HEADED CAT (Felis planiceps). Malaya, Sumatra, Malacca, and Borneo.

No commercial exploitation. Macveigh (pers. comm.) does not feel that the flat-headed cat has become scarce in Malaya and Sumatra in recent years. Nothing else is known about the biology or status of this cat.

BORNEAN RED CAT (Felis badia). Borneo.

Virtually nothing is known about this cat; there is no record of commercial exploitation.

GEOFFROY'S CAT (Felis geoffroyi). Bolivian Andes through Paraguay, Uruguay, and Argentina to Patagonia.

Virtually nothing is known about this cat; there is no record of commercial exploitation.

KODKOD (Felis guigna). Chile.

Another species about which nothing is known; no record of commercial exploitation.

PAMPAS CAT (Felis colocolo). Brazil, Bolivia, Ecuador, Peru, Chile and Argentina.

Grimwood (1969) says: "The skin of this species is valueless as a fur, and it is therefore not subject to commercial hunting." He also says that local enquiries have shown it to be present in Peru in almost every department of the Andean region, and it probably has a continuous distribution throughout that range.

JAGUARUNDI (Felis yagouaroundi). Southwestern U. S. to northern Argentina.

This species is widespread in distribution, and is not subjected to commercial hunting pressures. Denis (1964) places it in his conservation category A, for safest condition.

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LITERATURE CITED

- Allen, Glover M. 1939. A checklist of African mammals. Bull. Mus. Comp. Zool., Harvard. 763 pp.
- Anonymous. 1964. Fifty thousand leopards to make coats and handbags. Oryx, 7:155-156.
- Ansell, W. F. H. 1960. Mammals of Northern Rhodesia. Northern Rhodesia Department of Game and Fisheries, Lusaka. 155 pp.
- Bateman, James A. 1961. The mammals occurring in the Brasasdorp and Swellendam Districts, C. P., since European Settlement. Koedoe, 4:78-100.
- Berrie, Peter M. In Press. Ecology and status of the lynx in interior Alaska. In: Eaton, R. L. (ed.), Ecology and Conservation of the World's Cats. Lion Country Safari, Laguna Hills, California.
- Boorer, Michael. 1970. Wild Cats. Bantam Books, Toronto, New York, London. 159 pp.
- Brynard, A. M. and U. de V. Pienaar. 1960. Annual report of the biologist, Kruger National Park, 1958-59. Koedoe, 3:1-251.
- Burgess, P. F. 1961. Wild life conservation in North Borneo. Malayan Nature Journal, Special Issue (21st Anniversary), pp. 143-151.
- Chasen, F. N. 1940. A handlist of Malaysian mammals. Bull. Raffles Mus., Singapore. 209 pp.
- Cockrum, E. L. 1960. The recent mammals of Arizona. The University of Arizona Press, Tucson. 276 pp.
- Dalquest, Walter W. 1965. Mammals from the Save River, Mozambique, with descriptions of two new bats. Jour. Mamm., 46:254-264.
- Dang, Hari. 1967. The snow leopard and its prey. Cheetah, 10:72-84.
- Daniel, J. C. 1970. The tiger in India: An enquiry-1968-69. Jour. Bombay Nat. Hist. Soc., 67:227-234.
- de Alwis, W. L. E. In Press. Status of South East Asia's small cats. In: Eaton, R. L. (ed.), Ecology and Conservation of the World's Cats. Lion Country Safari, Laguna Hills, California.

- Denis, Armand. 1964. Cats of the world. Houghton Mifflin Co., Boston. 137 pp.
- Doughty, Robin W. and N. Myers. 1971. Notes on the Amazon wildlife trade. *Biological Conservation*, 3:293-297.
- Eaton, Randall L. In Press. Ecology and social organization of the cheetah. In: Eaton, R. L. (ed.), Ecology and Conservation of the World's Cats. Lion Country Safari, Laguna Hills, California.
- Eisenberg, John and N. Muckenhirn. In Press. The leopard in Ceylon. In: Eaton, R. L. (ed.), Ecology and Conservation of the World's Cats. Lion Country Safari, Laguna Hills, California.
- Ellerman, J. R. and T. C. S. Morrison-Scott. 1951. Checklist of Palaearctic and Indian mammals. British Museum (Nat. Hist.). 810 pp.
- Gaillard, Dr. 1969. Sur la presence du chat d'ore (Felis aurata Temminck) et du caracal (Felis caracal Schreber) dans le sud du Senegal. *Mammalia*, 33:350-351.
- Gaston, Astere. 1963. Ossements de Felis silvestris dans les fissures de calcaires d'arbon. *Mammalia*, 27:13-146.
- Grimwood, I. R. 1969. Notes on the distribution and status of some Peruvian mammals, 1968. American Committee for International Wild Life Protection and the New York Zoological Society, Spec. Publ. 21.
- Guggisburg, C. A. W. 1963. Simba, the life of the lion. Chilton Books, Philadelphia.
- Handley, C. O., Jr. 1966. Checklist of the mammals of Panama. In Ectoparasites of Panama, pp. 753-795. Field Museum of Natural History, Chicago.
- Harper, Francis. 1945. Extinct and vanishing mammals of the Old World. American Commission for International Wild Life Protection, Spec. Publ. 12. 850 pp.
- Harrington, Fred A. In Press. The Asian cheetah in Iran. In: Eaton, R. L. (ed.), Ecology and Conservation of the World's Cats. Lion Country Safari, Laguna Hills, California.
- Harrison, David L. 1968. The large mammals of Arabia. *Oryx*, 9: 357-363.

- Harrison, John. 1964. An introduction to the mammals of Sabah. The Sabah Society, Jesselton. 244 pp.
- Harrison, John. 1966. An introduction to the mammals of Singapore and Malaya. Tien Wah Press, Singapore. 340 pp.
- Hatt, Robert T. 1959. The mammals of Iraq. Misc. Publ. Mus. Zool., Univ. Michigan, 106:1-113.
- Hibbert, R. A. 1967. Wildlife protection in Mongolia. Oryx, 9: 196-210.
- Hopkins, Brian. 1970. The Olokemeji Forest Reserve. IV. Checklists. Nigerian Field, 35:123-144.
- Hornocker, Maurice G. 1970. Jaguar, status survey in Central and South America. World Wildlife Fund Project 526.
- Howell, John H. 1969. The Borgu Game Reserve of Northern Nigerian. Part II. Nigerian Field, 33:147-165.
- Leopold A. Starker. 1959. Wildlife of Mexico. University of California Press, Berkeley. 568 pp.
- Masak, Vratislav. 1967. Notes on the Siberian long-haired tiger, Panthera tigris altaica (Temminck, 1844), with remarks on Temminck's mammal volume of the "Fauna Japonica." Mammalia, 31:535-573.
- Myers, Norman. In Press. The spotted cats: In danger?--or in danger of danger? In: Eaton, R. L. (ed.), Ecology and Conservation of the World's Cats. Lion Country Safari, Laguna Hills, California.
- Myers, Norman. 1971. Spotted cats in trouble. International Wildlife, May-June.
- Novikov, G. A. 1956. Carnivorous mammals of the fauna of the U.S.S.R. Israeli Program for Scientific Translations, Jerusalem, 1962.
- Paradiso, John L. 1969. Mammals of Maryland. No. American Fauna No. 66. 193 pp.
- Petrides, G. 1956. Big game densities and range carrying capacity in East Africa. Trans. No. American Wildl. Conference, 21:525-537.
- Pienaar, U. de V. 1968. Ecology of the large mammals of Kruger Park. (Mimeo.)



- Prater, S. H. 1965. The book of Indian animals (2nd revised edition). Bombay Nat. Hist. Soc., and Prince of Wales Museum of Western India. 323 pp.
- Remy, Paul A. and B. Condé. 1962. Sur la biologie et la repartition actuelle de quelques mammiferes du nord-est de la France. *Mammalia*, 26:141-160.
- Schaller, George B. 1969. The hunt of the cheetah. *Animal Kingdom*, 72:2-6.
- Shortridge, G. C. 1934. The mammals of South West Africa. Vol. I. Heinemann, London.
- Shou Chen-Huang (General Editor). 1962. Economic mammals of China. Peking Science Publishing House (in Chinese).
- Sikes, Sylvia K. 1964. A game survey of the Yankari Reserve of Northern Nigeria. Part II. *Nigerian Field*, 29:127-141.
- Singh, Arjan. In Press. Status and social behavior of the north Indian tiger. In: Eaton, R. L. (ed.), *Ecology and Conservation of the World's Cats*. Lion Country Safari, Laguna Hills, California.
- Smithers, R. H. N. 1966. The mammals of Rhodesia, Zambia and Malawi. Collins, London. 159 pp.
- Snead, C. J. 1958. Mammals of the Uitenhage and Cradock Districts, C. P., in recent times. *Koedoe*, 1:19-59.
- Talbot, Lee M. 1960. A look at threatened species. Fauna Preservation Society. 137 pp.
- Taylor, W. P. and W. B. Davis. 1947. The mammals of Texas. Game, Fish and Oyster Commission, Austin. 79 pp.
- Turnbull-Kemp, Peter. 1967. The leopard. Howard Timmins, Cape Town, and Tri-Ocean Books, San Francisco.
- Von Richter, Wolfgang. In Press. Remarks on present distribution and abundance of some South African carnivores.
- York, William. In Press. A study of serval melanism in the Aberdares and some general behavioral information. In: Eaton, R. L. (ed.), *Ecology and Conservation of the World's Cats*. Lion Country Safari, Laguna Hills, California.





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