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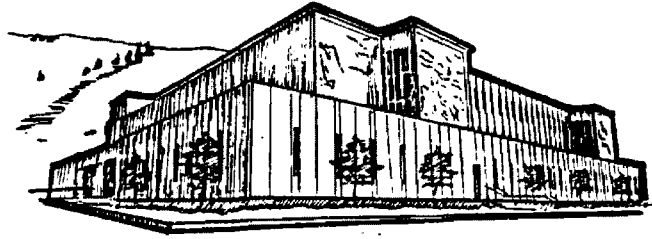
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University of  
**Montana**



MANAGEMENT PLAN FOR WILD UNGULATES IN  
BALOCHISTAN, PAKISTAN

BY

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B.S., University of Punjab, Lahore, Pakistan, 1981

M.L.S., University of Balochistan, Quetta, Pakistan, 1985

Presented in partial fulfillment of the requirements  
for the degree of  
Master of Science  
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1991

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Chairman, Board of Examiners

  
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## Chapter I

### INTRODUCTION

Balochistan has a wide variety of wild animals and plants. This is a land of deserts, plains, low hills, and high mountains. This variety of landscapes gives Balochistan diverse topographic and environmental conditions. With such variations, soil, climate, flora, and fauna also differ drastically in various parts of the Province. The flora and fauna of Balochistan have affinities to Palaearctic and Oriental regions. There are about 71 species of mammals, 360 of birds, and hundreds of species of freshwater and marine fish, amphibians, and invertebrates (Groombridge 1988). About 1198 plant species were recorded from Balochistan after the turn of this century (Burkill 1908). The present number of known flowering plants has increased considerably. Although the province is not inordinately rich in vertebrate species, it holds a number of species that are regarded as threatened at national or global levels, or are otherwise of special concern.

Balochistan harbors 7 species of wild ungulates; some are confined to this Province and found nowhere else in

Pakistan. In Balochistan, there are 3 species of the genus Capra, 1 species of the genus Ovis, 2 species of the genus Gazella, and 1 species of the genus Sus. Most of these species were abundant in the past, but during the last few decades they have been depleted due to over-exploitation, habitat destruction, habitat encroachment, and habitat degradation. Now, many wild ruminants are either endangered or reduced to small numbers. Small populations are restricted to isolated and inaccessible locations. The situation worsened in the 1980s, during the Afghan crises, with the arrival of about 1.5 million Afghan refugees in Balochistan. Many other conservation problems, such as lack of organization, scarcity of funds, poor law enforcement, poaching, and lack of awareness among masses, restrain effective management of wildlife resources.

Most parts of the Province have tribal communities. The livelihood of those communities depends on the habitats of wild ungulates. Therefore, management goals cannot be achieved without the active participation of those tribal communities.

The Balochistan Forest Department has responsibility for the protection and management of wildlife in the Province. The Wildlife Wing of the Department is in its early stages of development, and lacks manpower trained in the field of wildlife management. The government of Balochistan has created a few protected areas for the

conservation of wildlife. All wild ungulate species, except wild boar (Sus scrofa), have been declared as protected animals, but no proper management plan has so far been developed for scientifically managing wild ungulates.

This plan is the first approach toward guidelines for the scientific management of wild ungulates in the Province. Brief biological and geomorphological characteristics and wildlife management history of the Province will be described. The causes of decline in the wild ungulate populations and other conservation problems in the Province have been addressed. The plan deals with all 7 species of native ungulates, and discusses their habitats, distribution, and status. Management objectives and recommendations for each species will be provided. The role and degree of possible participation of tribal communities in the conservation of wildlife, along with a case study of a private conservation project, will be quantified. Overall management goals and recommendations for conservation of wildlife in the Province also will be provided in the plan. Information on the above subjects is sketchy, therefore, while discussing these issues, I will partially rely on my 5 years of experience in the Wildlife Wing of the Balochistan Forest Department.

### **Location**

Balochistan, the southwestern province of Pakistan,

lies between 24.9° - 32.1° N latitude and 60.9° - 70.2° E longitude. The Province shares its boundaries with Afghanistan in the northwest and Iran in the west. Balochistan borders the Pakistan provinces of Punjab to the northeast, North West Frontier Province (NWFP) to the north, and the southeastern side is bounded by Sind Province. The southern side is a long sea coast, extending for about 750 km from the Iranian border to Hub town near Karachi in the southeast (Fig. 1).

#### **Area and Land Use**

Balochistan, with an area of about 347,000 km<sup>2</sup>, is the largest province of Pakistan, comprising 44% of the total area (Survey of Pakistan 1985). According to the available historical records, the area has always been arid and semi-arid with sparsely distributed human populations (Roberts 1973). Though the area was sparsely populated in the past, the population has increased dramatically from about 1.2 million in 1951 to 4.3 million in 1981 (an increase from 3 [1951] to 12.5 [1981] individuals per square kilometer). These 4.3 million people are clustered in isolated pockets in valleys according to the availability of water and arability of the land. Out of the 34.7 million ha, only about 4.6 % is being exploited for agricultural purposes (Balochistan Agriculture Department 1989). Livestock raising is the major source of income for tribal peoples in

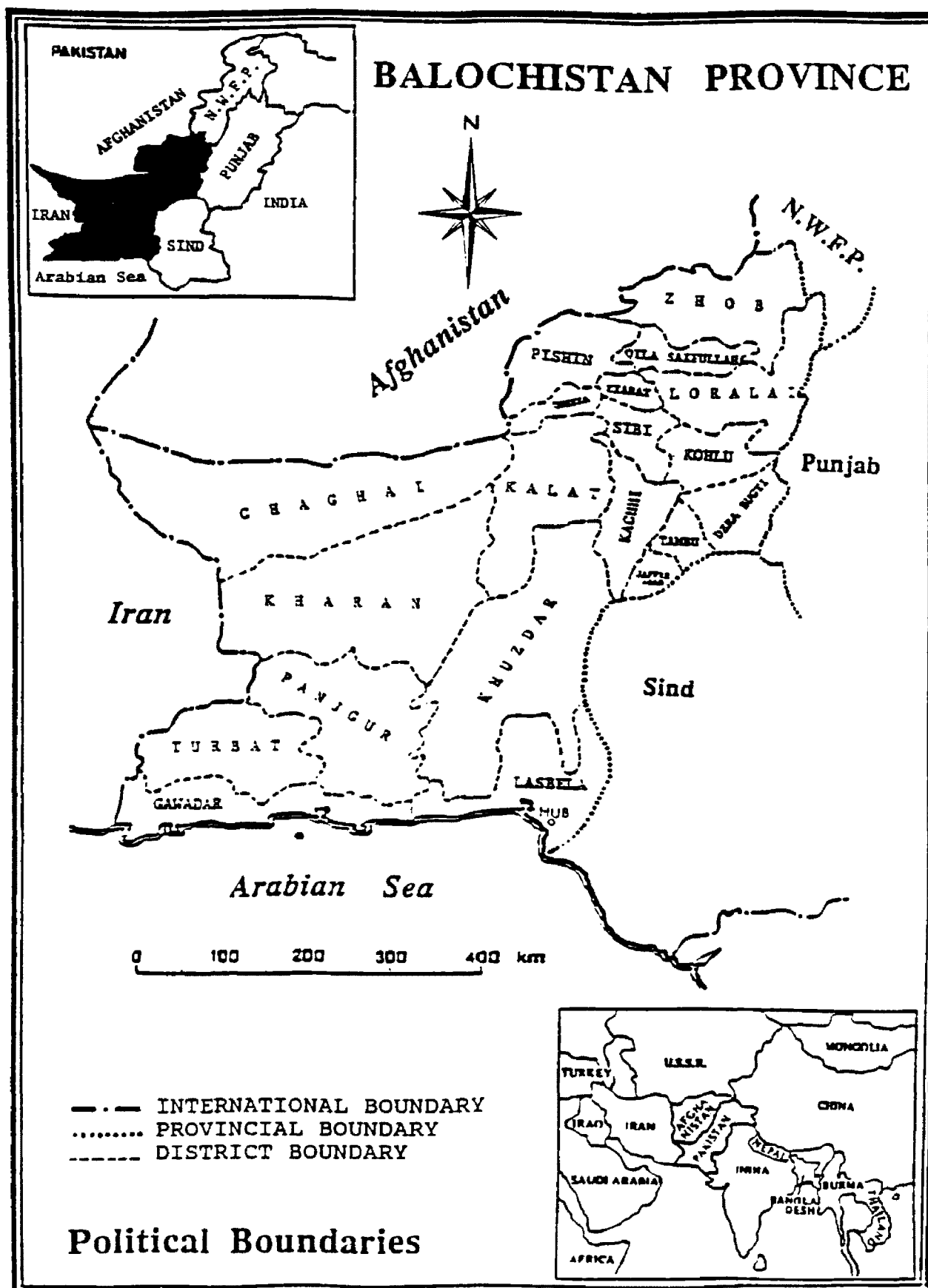


Fig. 1. Map of Balochistan Province showing political boundaries.



Balochistan. Although more than 90 % of its area is classified as rangelands, about 10 million ha are unproductive, 12 million ha produce nominal grazing, and about 1.6 million ha are little utilized by domestic livestock due to the inaccessibility of the hilly terrain and lack of water (Noor 1989, FAO 1983). The above figures suggest that most of the Province is more suitable for wild ungulates than livestock.

### **Land Form**

Balochistan is generally recognized as a land of diversity. About 80% of the area is classified as mountainous, and the remaining 20% is comprised of flood plains and alluvial deposits with high potential for cultivation (Noor 1989). Geomorphologically, Balochistan has 4 major land types: upper highlands, lower highlands, plains, and deserts (Groombridge 1988). Some of the important mountain ranges are Suleiman , Toba-Kakari, Central Brahui, Kirthar, Chaghai and Raskoh hills, Siahian, Pob, Central Mekran, and Mekran Coast (Fig. 2). All these ranges vary in height, length, and orientation. Most mountains are characterized as rugged, barren, precipitous, and arid. The elevation varies from sea level in the south to about 3600 m at the highest summit of Zarghun, east of Quetta.

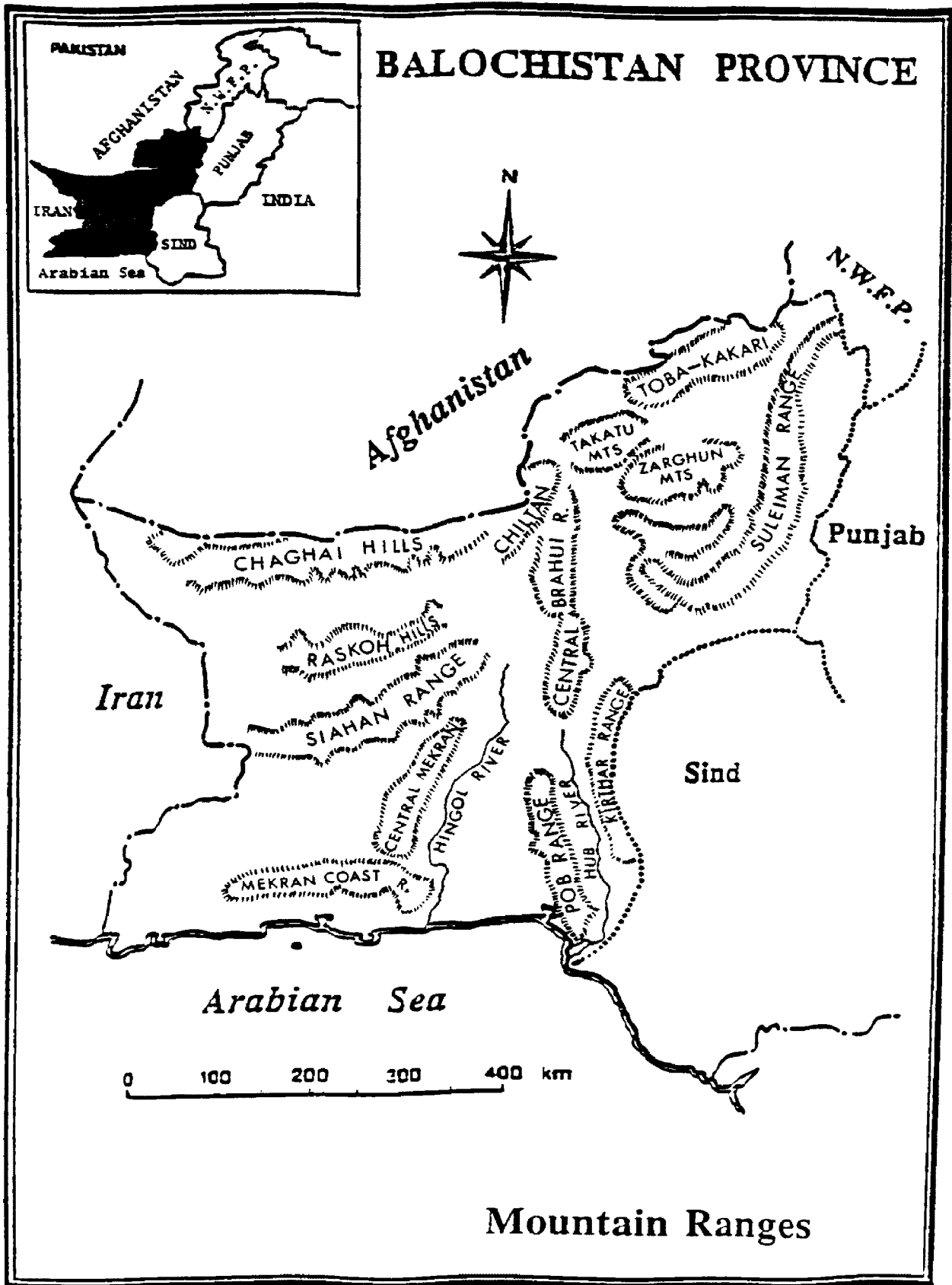


Fig. 2. Map of Balochistan Province showing important mountain ranges.

## **Climate**

The climate of the Province is generally dry, with mean annual rainfall increasing from 50 mm in the northwest to 400 mm in the east (Kidd et al. 1988, Fig. 3). The distribution of precipitation is inconsistent and difficult to predict, with periods of extreme drought. Most of the Province lies outside the range of monsoons. Summer rains are very limited and unpredictable, whereas winter rains are more common. The major source of precipitation is rain. Seasonality is more noticeable in the temperate uplands of the north and less prominent in the sub-tropical zone of the south. The coastal area is affected by wind currents from the Arabian Sea, the temperature may be mild from June to September with damp and cloudy weather. In general, the Province faces extremes of harsh temperatures. The maximum summer temperature of about 48° C is frequently approached. in the plain of Sibi and Nou-kundi areas. Winter is severe at higher elevations and temperatures sometimes drop to -15° C near Kalat. Due to limited precipitation and very high summer temperatures, the evaporation of surface water is high and the humidity level remains low almost year round. The high variability in annual rainfall and temperature provide many different environmental conditions.

## **Hydrological Features**

No major river in Balochistan carries a large and

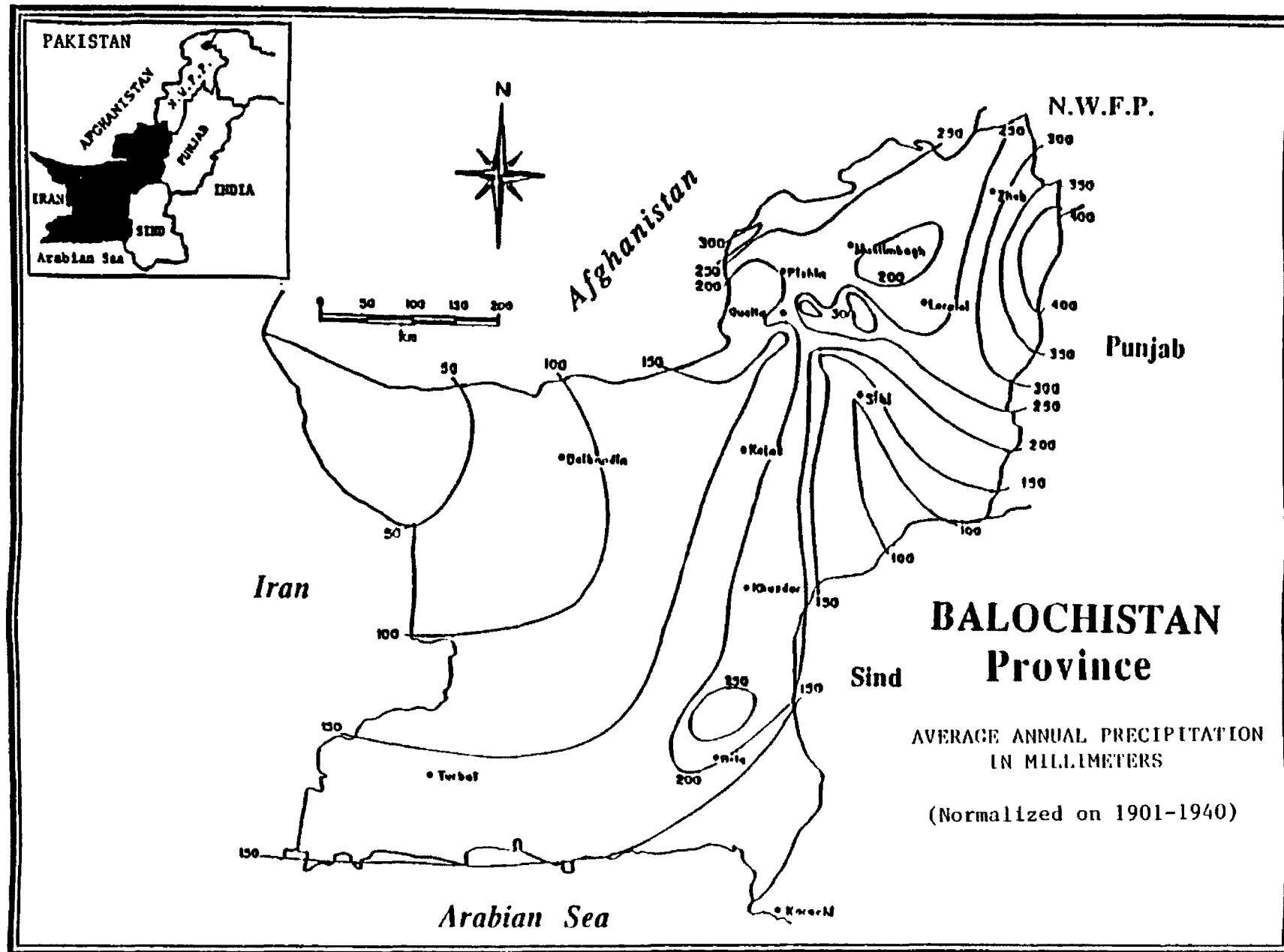


Fig. 3. Map of Balochistan showing average annual precipitation in different regions of the Province. (Adapted from Kidd et al. 1988.)

regular flow of water. A few rivers and streams run intermittently but remain dry during most of the year. However, they often become powerful torrents after heavy rains, causing floods in the lower plains. Some of the streams flow throughout the year, providing water for humans, livestock, and wildlife. The notable rivers and streams are Zhob, Nari, Bolan, Pishin lora, Mula, Hub, Porali, Hingol, Rakhshan, and Dasht.

Besides rivers and streams, the diverse topography accumulates water in the form of lakes, depressions, ponds, and springs. Some of these water bodies have been developed for irrigation purposes. Quite a few of them serve as permanent reservoirs while others are temporary, being limited to winters. However, natural water bodies are major sources of water for free-ranging ungulates and other fauna.

## **Fauna and Flora**

### **Biogeographical Affinities**

General investigation of the flora and fauna of Balochistan dates back to the early 20th century during the colonial period. Natural history collections were made by the various civil and military personnel of the British regime during colonial times. Most of the biota has not yet been investigated scientifically.

The flora and fauna of the Province show

characteristics of both Palaearctic and Oriental regions. Particularly, mammals and reptiles show affinities with the Palaearctic region. The Palaearctic fauna of Balochistan is mostly found in the northwest and southwest; whereas, the Oriental species are predominant in the east. Those Palaearctic species found in southern Balochistan are adapted to arid conditions and a hot climate (Roberts 1977).

Apart from different biogeographical affinities, the geographical location of the Province lies on the main route of bird migration from breeding ranges in the Soviet Union and Afghanistan to wintering areas in Iran. Thus, the area provides either wintering grounds or refuge during migration.

The Province supports a great diversity of fauna and flora. Groombridge (1988) listed 61 species of freshwater fish, 7 amphibians, 94 reptiles, 360 birds, and 71 mammals in Balochistan. Most of the 360 bird species recorded in Balochistan represent passage migrants and winter visitors (mostly waders and seabirds).

According to Stewart (1982), about 1500 plant species are found in Balochistan. However, systematic knowledge of plant communities is still incomplete, and no comprehensive analysis of endemism, species diversity, and relationships is available. The number of animal and plant species identified is likely to increase as investigations proceed further.

## Wild Ungulates

The following species of wild ungulates of family suidae and bovidae are found in the province:

### I. Family suidae

Species : Sus scrofa (wild boar)

### II. Family Bovidae

Sub-family : Antilopinae

Species :

1. Gazella bennetti (chinkara gazelle)

2. G. subguttrosa (goitred gazelle)

Sub-family : Caprinae

1. Species :

a. Capra falconeri megaceros

( straight-horned markhor)

b. C. f. chiltanensis

( chiltan markhor)

2. Species :

C. aegagrus blythi

(wild goat)

3. Species : Ovis vignei blanfordi

(Balochistan urial)

## Habitat Types and Associated Wild Ungulates

Aridity, extremes of temperature, poor sandy or stony soil, and high grazing pressure, are major causes of sparse and thorny vegetation. Champion et al. (1965) described the

forest types of Pakistan, and Beg (1975) provided an overview of the wildlife habitats. Roberts (1977) gave a very good, brief account of habitat types with particular reference to mammals. By using all these sources, I summarize the following wildlife habitats with reference to wild ungulates in Balochistan.

#### A. Dry Temperate Forests

This type of forest is confined to the areas above 1600 m in the steep rocky slopes of the Suleiman, Central Brahui, and Toba-kakari mountain ranges, notably the ranges around Quetta and Ziarat. These areas usually have mild summers but long harsh winters. These xerophytic, open forests are typically represented by coniferous species.

##### 1. Pine Forests

This habitat type is found above 2250 m in the northern extremities of the Suleiman Range and parts of the Toba-Kakari Range. Typical plant communities include Pinus wallichiana, P. gerardiana, Juniperus micropoda, Pistacia cabulica, P. khinjik, Fraxinus xanthoxyloides, Ephedra spp., Caragana spp., Berberis balochistanica, Sophora griffithi, Daphne oleoides, Artemesia maritima, Prunus eburnea, Stipa pennata, Pennisetum orientale, Andropogon sp., Chrysopogon aucheri, and Cymbopogon sp.



Associated wild ungulates are straight-horned markhor and Balochistan urial.

## 2. Juniper Forests

Juniper (Juniperus macropoda) is the predominant species between 1650 and 2250 m and forms an open canopy forests in southern parts of the Suleiman (including mountains around Ziarat) and Central Brahui ranges (including Zarghun, Harboi, and Chiltan Mountains). Lower slopes of these mountains are occupied by Pistacia cabulica, P. khinjik, Fraxinus xanthoxyloides, Ephedra spp., Caragana spp., Berberis sp., Sophora griffithi, Daphne oleoides, Ferula foetida, Artemesia maritima, Prunus sp., Rosa webbiana, Tulipa sp., Stipa pennata, Pennisetum sp., Clematis sp., Andropogon sp., Chrysopogon aucheri, and Cymbopogon sp. Straight-horned markhor, chiltan markhor, Balochistan urial, and Sind wild goat (only in Harboi hills) are the wild ungulate species found in this habitat type.

### B. Dry Subtropical Broad-Leaved Forests

This type of habitat is found between 500 m and 1600 m in the low highlands of Suleiman, Kirthar, Raskoh, Central Brahui, and Central Mekran ranges. Most of the vegetation on the foot hills and lower slopes is comprised of broad-leaved shrubs and thorny trees.

## 1. Dry Subtropical Forests

This habitat is confined between altitudes of 1000 m and 1600 m in most of the low highlands of Balochistan, and is mostly characterized by Olea cuspidata, Acacia modesta, and Pistacia spp.

However, the Acacia modesta. is restricted to the lower altitudes. Other plant species are Fraxinus xanthoxyloides, Haloxylon griffithi, Artemesia scoporia, Perowskia sp., Chrysopogon aucheri, Cymbopogon schoenanthus, and Bromus sp. This habitat is inhabited by Sind wild goat, Balochistan urial, and chinkara gazelle.

## 2. Balochistan Dry Mixed Scrub

Most of the lower reaches of the mountains in many areas have been denuded by woodcutting, and shrub vegetation has developed. In most places, trees failed to become re-established because of biotic and abiotic factors. This is particularly true for the mountains of the eastern and southern parts of the Province. The composition of remnant scrub vegetation varies in different areas, the prominent plant species include Haloxylon griffithi, Artemesia scoparia, Stocksia griffithi, Crotolaria burhia, Caragana ambigua, Astragalus sp., Sophora griffithi, Perwoskia artemisioides, Chrysopogon aucheri, Cymbopogon sp., Bromus sp.,

and Poa sinacia. Wild ungulates associated with this habitat type are Balochistan urial and chinkara gazelle.

### C. Tropical Thorn forests

Open lowlands, foot hills, plains, valleys, deserts, pats (dried mud flats), saline tracts, and coastal sand dunes from sea level to 1200 m support this habitat type, in which a wide variety of habitat conditions exist. The loose sandy or stony soil supports extremely xerophytic vegetation. Species of the genus Zizyphus, Capparis, Haloxylon, and Calligonum are dominant in certain areas. The last 2 are frequent in sand dunes of Chaghai District. Mazri palms Nannorrhops ritchiana frequently occur along water courses from 500 m to 1200 m. Saline zones are scattered in the Zhob, Khuzdar, Sibi, and Chaghai areas. These zones are typically occupied by low shrub covers of Salsola sp. and Suaeda sp.. Other prominent plant species are Tamarix dioica, Cyperus rotundus, Achyranthes aspera, Salvadora persica, Prosopis spp., and Tamarix spp. This habitat type is inhabited by chinkara gazelle and goitered gazelle in the deserts and plains, and Balochistan urial in low hills.

### D. Tropical Littoral and Swamps

Mangrove scrub is present in deltoid regions of the Hub River in Lesbela District. The species

dominating this area include Avicennia officinalis, Cerieps tagal, and Bruguiera conjugata. Along the lakes, riparian areas, and rivers, there is scrub and grasslands with Tamarix sp., Typha sp., Salix sp., Phragmites sp., and Saccharum ravennae. Wild boar is the only wild ungulate that occupies this type of habitat.

### **Management History**

Little information is available on the history of wildlife management in Blochistan. Records indicate little government management of fauna and flora before 1890. In the settled areas of the province, minimal wildlife protection was attained through the Balochistan Forest Regulations, 1890 and the Indian Forest Act, 1927 (Rao 1984). These Regulations and the Act regulated grazing by livestock in protected and reserve forests. However, some control of hunting was also possible by rules issued under the Forest Act, 1927, but such rules were only applicable in the reserved or protected forests. A series of Government gazetteers published in 1906 contain lists of certain species of plants and animals in various parts of Balochistan (Government of Balochistan 1986).

During the first half of this century, a few Khans, Nawabs, and Sardars closed some of their areas as personal "shikargahs" (game reserves), where protection was provided

to game animals and birds. No written laws were adopted, but hunting was only by the rulers and their accompanied guests. The Khan of Kalat, Nawab of Kharan, and Nawab of Sarawan protected wildlife in some areas. It is believed that the Raskoh area of Kharan District was well protected by the Nawab of Kharan, and the Sarajabad area in Kachhi District was managed as a private game reserve by the Nawab of Sarawan (M. Shafique, pers. commun.).

After independence in 1947, a separate Game Department was created in (then) West Pakistan, and game management responsibility was entrusted to this Department. The Department consisted of a Game Warden, a Deputy Game Warden, 4 Assistant Game Wardens, 50 Game Inspectors, and about 620 Game Watchers (Grimwood 1969). In Balochistan, the Game Department Unit was headed by an Assistant Game Warden along with other skeleton staff. Unfortunately, this unit primarily regulated hunting of game birds and small mammals. Little attention was given to the protection of wild ungulates or other wildlife of the Province. During the late 1950s, great pressure was exerted on all natural resources due to the rapid changes in land use, exploitation of resources, lack of planning and management, and poor law enforcement. This was also the era when government officials started taking interest in wildlife protection. Consequently, "West Pakistan Wildlife Protection Ordinance, 1959" was enacted, and West Pakistan Wildlife Protection

Rules, 1960 were promulgated under that ordinance. The ordinance and rules did not bring fruitful results, because the provisions under those laws were entirely of a regulatory nature for hunting and export of game species. One game sanctuary and 4 game reserves, extending over 83,200 and 25,600 acres, respectively, were declared protected areas in Balochistan. However, no provision was made for protection of habitats from settlement, cultivation, grazing within the protected areas, and other kinds of destruction. Chinkara gazelles were the only wild ungulates declared as protected animals in Balochistan. The laws under the 1959 Ordinance were inadequate and ineffective.

Serious conservation efforts began in Pakistan during 1966, when World Wildlife Fund International (WWF) was invited to suggest wildlife preservation strategies. Two WWF expeditions in 1966 and 1967 under the leadership of Guy Mountfort ascertained the wildlife situation in the country, and made recommendations for improvement of administrative and legal frameworks. Mountfort and Poore (1967) reported that hunting was well organized under the existing game laws, although some revisions were required. Apparently, the game laws were poorly enforced in many areas. The number of Game Wardens was very small and they lacked transportation, which rendered them unable to protect their regions effectively. They also lacked status and authority to

apprehend violators who were above their own social level. There was a difficulty in preventing shooting by military and civil officers. On the recommendation of the WWF expeditions, a powerful Wildlife Enquiry Committee (WEC) was constituted in 1968 to assess the problems and suggest necessary measures to protect wildlife and its habitats.

Subsequently, UNDP-FAO assigned I. R. Grimwood to investigate and report on the wildlife situation in Pakistan. Grimwood (1969) reported that poaching and habitat destruction were major threats to the survival of wild animals. He also mentioned that habitat deterioration was a greater threat to most of the species than hunting. Further, legislation, administration, and law enforcement were considered ineffective. Wildlife education, training, and research were reported as inadequate.

In 1967, the West Pakistan Game Department was abolished and its functions and skeleton staff were transferred to the provincial forest departments. New service rules, namely the "West Pakistan Forest Department (Wildlife Wing), 1967" were released. The Balochistan Forest Department inherited the game staff of 1 Sub-divisional Officer, Wildlife, 2 Game Inspectors, and dozens of Game Watchers. The Sub-divisional Officer, Wildlife, was attached as a Staff Officer to the Chief Conservator of Forests. He was also responsible for regulating hunting and controlling poaching mostly in Quetta-Pishin District. According to

their locations, the game inspectors and game watchers were placed under the administrative control of concerned territorial Divisional Forest Officers (DFO). The situation remained the same as it was prior to merging the Game Department, or even worse. Consequently, wild ungulates reportedly were depleted by extensive poaching.

The WEC established in 1968 finalized its findings and submitted its report in 1971, which contained the following recommendations (GOP 1971):

1. Create national parks, wildlife sanctuaries, and game reserves.
2. Introduce scientific management through working plans.
3. Promote appropriate institutional and administrative arrangements by establishing separate directorates of wildlife with their own staffs.
4. Accelerate training, education, and research in the field of wildlife management.
5. Promote public awareness to obtain public support and participation in wildlife conservation and planning for tourism.
6. Promulgate a legal framework for wildlife conservation.

The WEC also provided draft legislation that addressed the necessary legal framework for creation of national parks, wildlife sanctuaries, game reserves, and a Wildlife Advisory Board. Protection was aimed at a wide range of



species. Grimwood (1970) proposed similar measures for effective wildlife conservation in Pakistan.

In partial fulfillment of the recommendations of the WEC, legislation was enacted in 1974 as the "Balochistan Wildlife Protection Act, 1974". This Act amended and consolidated laws relating to preservation, conservation, and management of wildlife in the Province. The Act prescribed wildlife as property of the Government. Reptiles, birds, and mammals found in the Province were classified under 3 categories (schedule). Animals which were allowed to be hunted or captured through a license or permit were listed in the first schedule. The second schedule included animals for which possession was lawful with a certificate or possession license. The third schedule contained protected animals whose killing, capturing, and export were prohibited. Hunting seasons and methods were prescribed. All native ungulates except wild boar were declared protected animals. After enactment of this law, many wildlife sanctuaries and game reserves were created throughout the Province, with some additional posts for game watchers for each area. These wildlife sanctuaries and game reserves were selected without scientific surveys or proper management plans. Most were established on the basis of information collected from various "shikaries" in the region. The potential and chances of development in each area were not considered. Rao (1984) reported that, in the absence of

criteria for the selection of an area as national park, wildlife sanctuary or game reserve, most of these areas were created haphazardly. The boundaries were not drawn along ecological boundaries, their sizes were small, and wide dispersion made them isolated islands.

The turning point in the history of wildlife conservation in Balochistan occurred in 1977, when the Government decided to establish the first National Park in the Province. Hazarganji State Forest and Chiltan Protected Forest, lying in close proximity to the provincial capital, Quetta, were selected for the purpose. Through the development process initiated in 1978, the area was declared a National Park in 1980. A post of Divisional Forest Officer, Wildlife, and a post of Sub-Divisional Officer, Wildlife, along with other complementary staff were authorized. The DFO, Wildlife, Hazarganji-Chiltan National Park, under administrative control of the Chief Conservator of Forests, was also entrusted with responsibility for all wildlife issues and policies.

During the 1980s, wildlife conservation in the Province faced many problems. Few conservation projects were implemented successfully, and others were abolished for political reasons. Emphasis was on creation of posts for Game Watchers to oblige MNAs (Member National Assembly), MPAs (Member Provincial Assembly), and tribal sardars without regard for the protection of wildlife. Consequently,

the Wildlife Wing was deprived of administrative and supervisory staff. In some areas, Game Watchers outnumbered wild ungulates. During 1985-86, wildlife conservation and propagation was popular, but no infrastructure of a conservation agency existed.

Development projects were initiated in fiscal year 1985-86 for establishment of new national parks, 1 each at Takatu (Quetta District), Hingol (Lasbela District), and Dhrun (Khuzdar District). Though the areas had good habitats for markhor, wild goat, and Balochistan urial in the past, no biological assessments were undertaken prior to initiation of development activities. A post of Assistant Conservator, Wildlife, to supervise Hingol and Dhrun National Parks and 3 more posts of Sub-divisional Officer, Wildlife, (1 for each park area) along with complementary staff were sanctioned. However once again, emphasis was on Game Watcher posts to encourage local participation and job opportunities. These plans have suffered from lack of trained supervisory staff and proper administration.

Hingol and Dhrun areas were declared national parks in 1988 with 167,700 and 165,004 ha, respectively. During 1988, the Wildlife Management Specialist and Forest Botanist of the Pakistan Forest Institute were invited to study the floral and faunal characteristics and suggest measures to improve the wildlife situation in the Hingol and Dhrun areas. After visiting these areas in February 1989, the

experts highlighted conservation problems and made useful suggestion for improvement of conservation measures. They reported that habitat for the concerned species was adequate and, where inadequate, had sufficient potential for improvement. They also mentioned that direct killing was causing more damage to the animal and bird populations than shortage of food (Khan and Beg 1989).

In 1985-86, another project was sanctioned that is worth-mentioning. It was thought that goals of conservation might be achieved by propagation of wild species in captivity. Therefore, a scheme for establishment of a game bird farm at Quetta was executed with a target to breed at least 5000 chukor partridges (Alectoris chukar) per year in captivity. These birds were to meet the local demands and reduce poaching pressure on chukor partridges in the wild.

Meanwhile, in the fall of 1985, Dr. Bart O'Gara, Leader, Montana Cooperative Wildlife Research Unit visited Balochistan. During the course of his meetings with provincial authorities, the project for raising chukor partridges was discussed in detail. He warned that captive breeding of game birds is a difficult task and without technical expertise, such a project may not be feasible for Balochistan. In spite of his warnings, more than 3 million rupees (U.S. 100,000) was spent on the project, and only 500 birds have been raised so far. The department has learned tangible lessons from this experience.

Recently, another program for the conservation of wild ungulates has occurred in the Torghar mountains of northern Balochistan, based on the concept of sustainable yield, international hunting, and participation of tribal people. The program is totally on a private basis, and to date the news is quite encouraging. This may promote understanding between the provincial Government and the tribal communities and serve conservation by using, but not over-exploiting, wildlife resources.

Many protected areas in the Province have been created for the protection of wildlife, these include 3 national parks, 14 wildlife sanctuaries, and 5 game reserves with a total area of 1,531,420 ha. Most of these areas have 1 or more wild ungulate species. The number of hectares are impressive (Table 1, Fig. 4), but most wildlife sanctuaries and game reserves actually exist only on paper. Proper management plans have not been developed for improvement of these areas. Even protection is minimal. Conservation goals can not be achieved without proper supervisory staff, equipment, training, and public awareness. Although more than 20 years have elapsed since the recommendations by WEC, those recommendations have not been implemented with full enthusiasm for many reasons. During the 1980s, wildlife conservation in Balochistan has remained nearly the same as was described by Mountfort and Poore (1967) and Grimwood (1969) for all of Pakistan.

Table 1. Protected areas (national parks, wildlife sanctuaries, and game reserves) in Balochistan.

Name of Area	Location (District)	Area (Hectares)
<b>National Parks</b>		
1. Hazarganji-Chiltan	Quetta/Kalat	15,555
2. Hingol	Lasbela/Gawadar	167,700
3. Dhrun	Khuzdar	165,004
<b>Game Sanctuaries</b>		
1. Maslakh	Pishin	46,559
2. Sasnamana	Ziarat	6,607
3. Ziarat Juniper	Ziarat	37,247
4. Koh-Gishk	Kalat	24,356
5. Kachau	Khuzdar	21,660
6. Shashan	Khuzdar	29,555
7. Chorani	Khuzdar	19,433
8. Dureji	Lasbela	178,259
9. Khurkhara	Lasbela	18,345
10. Rughia Rakhshan	Kharan	125,425
11. Kolwah Kap	Turbat	33,198
12. Buzi Makola	Gawadar	145,101
13. Gut	Chaghai	165,992
14. Raskoh	Kharan	99,498
<b>Game Reserves</b>		
1. Gogi	Ziarat	7,773
2. Wam	Ziarat	10,364
3. Kamrbran	Chaghai	211,433
4. Zangi Nawar Lake	Chaghai	1,060
5. Bund Khushdil Khan	Pishin	1,296
<b>Total:</b>		<b>1,531,420</b>

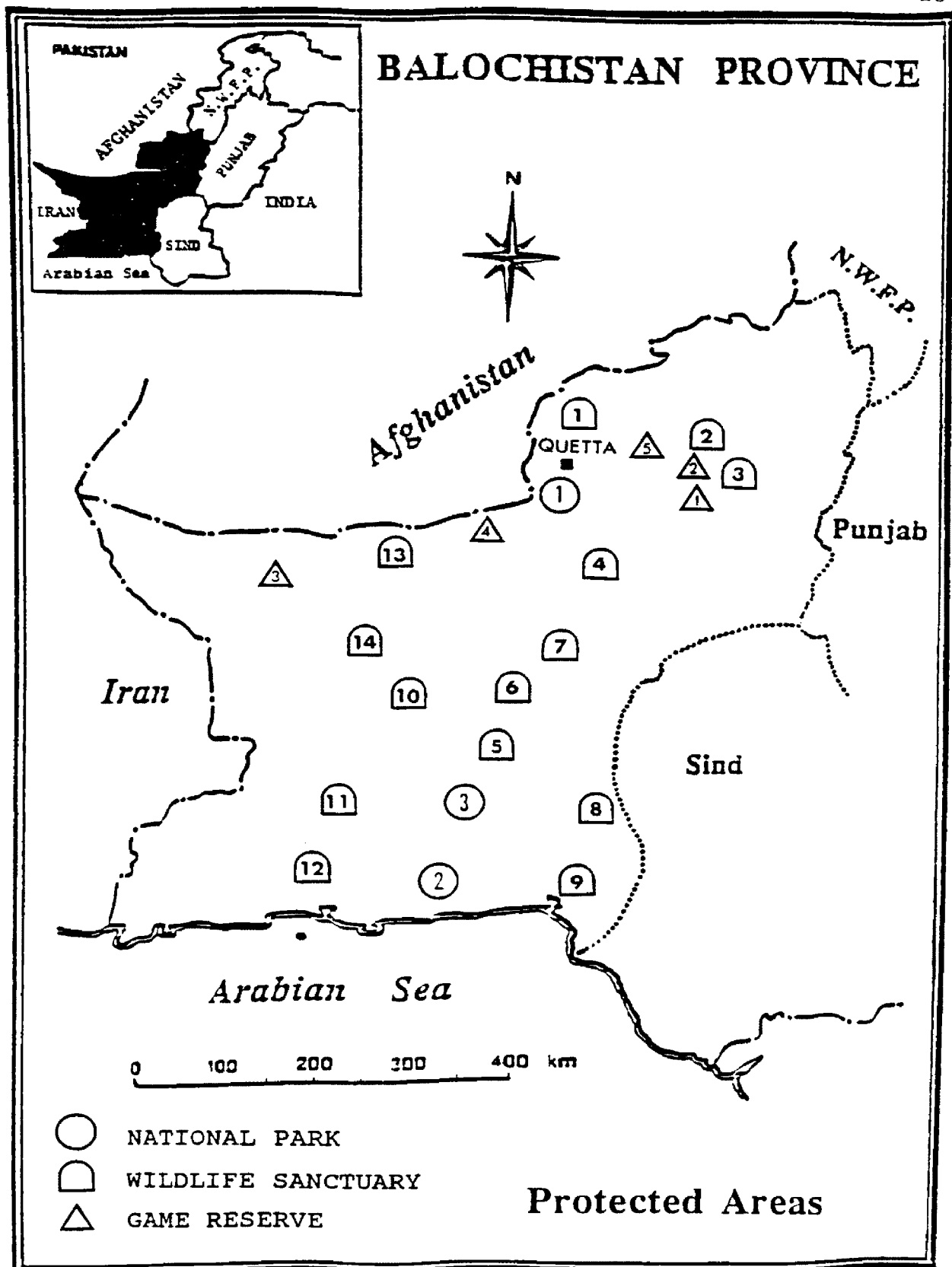


Fig. 4. Map of Balochistan showing location of national parks, wildlife sanctuaries, and game reserves. Each number refers to a particular area mentioned in Table 1.

## Chapter II

### CONSERVATION PROBLEMS

Balochistan was once famous for its wild ungulates. Most of the species were common in 1900, but in the recent past humans have brought some species to the verge of extinction, while others are found in small numbers as island populations. Why are steps not being taken to save these valuable resources?

Wildlife conservation has never been a priority in Balochistan, and it may take years to introduce proper conservation and management programs in the Province. Several conservation problems exist in Balochistan. Only those that are major hurdles to conservation (law enforcement, socio-economics, politics, lack of awareness, administration, and shortage of trained staff) are discussed here.

#### Law Enforcement

Legislation for the protection of wildlife in the Province exists in the form of the Balochistan Wildlife



Protection Act, 1974 and rules framed under this Act as Balochistan Wildlife Protection Rules, 1975. This Act provides protection to certain species, the killing, capturing, and possession of which are prohibited. It also regulates hunting, possession, export, and import of some game birds and small mammals. It prescribes management tools such as creation of protected areas like national parks, wildlife sanctuaries, and game reserves. Penalties for violators have also been described (Government of Balochistan 1977). Although necessary amendments have been made from time to time, the Act still has many shortcomings to provide protection and management strategies for the present conservation needs.

All wild ungulates except wild boar are protected under the Balochistan Wildlife Protection Act, 1974, and there are strict regulations against poaching. However, enforcement of this law has never been satisfactory due to insufficient staff, lack of proper equipment, and non-cooperation of judicial authorities. Balochistan maintains a tribal society, and most of the existing subordinate staff (Rangers and Deputy Rangers, Wildlife) belong to tribal communities. They often are reluctant to take action against an illegal activity because the offenders might be from their own tribes, members of a sardar's family, or local high-ranking civil officers. Usually, wildlife protection is a task for Game Watchers, the lowest rank in the wildlife cadre. They

have no means of transportation, are woefully under paid, and may suffer from status consciousness. Thus, they often try not to face wealthy and resourceful hunters. The Game Watchers know such hunters are never persecuted. If by chance hunters are met in the field, the watchers may either keep silent or even join the hunting party as a guide. The latter job is financially rewarding and provides a powerful incentive to supplement the pay they get from the Department. The range of the Balochistan Wildlife Protection Act has been extended to the provincially administered tribal areas since 1980. However, laws have never been enforced due to the political sensitivity of these areas and the strong hold of tribal chiefs, especially in tribal areas of Zhob, Qila Saifullah, Loralai, Dera Bugti, and Kohlu districts.

The Act prescribes different penalties for violation of its laws, such as imprisonment for up to 2 years, fines up to 1000 rupees (U.S. \$ 45), or both. There is rarely a case in which a court has imprisoned a culprit, and the amount of fine is far less than the actual value of loss. Most often, fines range from 50 to 500 rupees (U.S. \$ 2 to 20). I have seen instances where, after a court trial, a culprit was fined 50 rupees (U.S. \$ 2), although he was ready to pay hundreds to the wildlife staff for not bringing him to the court of law. Another reason for ineffectiveness of law enforcement is that wildlife offense cases are kept pending

for more than a year without trial. This might be because of low priority or courts being over-burdened from other cases.

During his review of wildlife legislation in Pakistan, Rao (1984) reported that wildlife laws are complicated and difficult to understand, and terms have not been defined properly. As a result, the laws and rules under the Act are confusing for the enforcement staff, courts, dealers, hunters, and others who should understand them. All these problems contribute to poor law enforcement, resulting in unchecked poaching and other illegal practices that drastically reduce the wildlife of Balochistan.

The traditional nomadic society of Balochistan evolved with a hunting and food gathering life style. In the past, hunting was only a part-time pursuit by rural populations (Roberts 1973). However, with economic prosperity, availability of sophisticated firearms, and modern means of transportation, the incidents of poaching have increased considerably. Poaching of wild ungulates has been intense during the last 2 decades, causing tragic declines in populations. Traditional hunting and marksmanship skills are still present in the tribal communities, and meeting professional "shikaries" is still possible (Roberts 1973). Now, these shikaries usually aid illegal hunting parties, especially from big cities like Karachi and Quetta. Poachers from the cities do not have knowledge of the local terrain and location of animals. Therefore, most hunting is done by

invitations from tribal sardars and, in some cases, with the help of prominent local shikaries. In other cases, senior military officers and, to a lesser extent, high ranking civil officers and their friends, who consider themselves above the law, are involved in poaching. Sometimes, local tribal chiefs or members of their families also indulge in poaching. Usually, little poaching is done by poor local residents. However, they may accompany tribal chiefs or high ranking government officers just to win their favors. To them, animals have little value. I would like to repeat here George Schaller's remark about hunting in the mountains of Pakistan, " if it moves, shoot it, if it doesn't, chop it down" (Schaller 1976). This slogan is still practiced in the mountains of Balochistan. Hunters in Balochistan rarely observe hunting rules, and kill whatever comes their way, including pregnant females and young animals. The worst cases involve hunters using helicopters and automatic firearms to massacre big game. This type of poaching has been reported in Hingol and Dhrun areas prior to 1989 (Khan and Beg 1989).

Since the early 1980s, the presence of more than 1.5 million Afghan refugees in Balochistan has resulted in cheap and easily available firearms. This availability of firearms in tribal communities has resulted in a severe assault on wildlife, especially wild ungulates.

All the above facts indicate lack of knowledge about

the importance of wildlife and its conservation. If this trend continues, there will be little chance that the next generation will see unique wild ungulates roaming in the mountains of Balochistan.

### **Socio-economic**

Socio-economic problems are the core of the entire complex of conservation problems. The sanctity of traditional patterns and practices often make them indestructible. However, the increase in human populations has changed traditional landuse practices. Public lands are overburdened with grazing, collection of firewood, and other privileges (Khan 1970). Socio-economic problems are the result of 3 major factors: livestock grazing, firewood removal, and encroachment of habitat for agriculture or settlement.

**Livestock grazing:** To meet the economic needs of the increasing human population, almost everyone in the rural areas depends on subsistence agriculture and livestock raising . Various Baloch and Pathan tribes are still nomadic or semi-nomadic. They maintain large flocks of sheep and goats.

Livestock in Balochistan depend almost entirely on public rangelands. The available statistics suggest that the total number of livestock (sheep, goats, cattle, buffaloes,

camels, horses, and donkeys) have increased from 7.2 million in 1972 to 9.6 million in 1976, 16.0 million in 1982 (Mian 1983), and 20.4 million in 1986 (Government of Pakistan 1986). Among 1986 figures, 18.4 million are sheep and goats. Sheep and goats compete most vigorously with wild ungulates for food, water, and cover. It is expected that sheep and goats will increase further as the price of livestock goes up. Due to continued misuse of rangelands, the current trend of retrogression in vegetation continues. This results in a decrease in desirable plant species and an increase in undesirable forage. Deterioration of wild ungulate habitat by lower production of quality forage results (Khan 1970). Consequences are obvious-- degradation in the density and composition of vegetation and increases in unpalatable plant and shrub communities. As the vegetation decreases, there is less water retention, organic material, and nitrogen in the soil. Thus, land is subject to heavy erosion (Rao 1989a).

Traditionally, nomadic flocks have followed a migratory pattern from highlands to wintering areas and back. Since the early 1980s, because of the Afghan crisis, this movement has ceased. Most of the Afghan nomads or powindahs stay in Balochistan or came back as refugees, bringing with them 1.8 million head of livestock. Termination of nomadic patterns has resulted in most rangelands being used year-around (FAO 1983). Wild ungulates now face competition throughout the year. Large numbers of sheep and goats in wild ungulate

habitat pose a serious threat to remnant populations of Markhor and Urial. Livestock competition is severe where their ranges overlap with those of wild ungulates. Reduction in kind, quality, and quantity of forage may result. Lack of food and other stress situations may cause loss of body weight, low reproductive success, and susceptibility to diseases in wild ungulates.

Though no detailed study has been carried out on range productivity or the impact of livestock on wildlife of the area, various scientists have remarked on rangeland conditions in Balochistan. Roberts (1973) noticed that palatable grass species were almost eliminated from most areas. Because goats consume woody vegetation and grasses, and are easier to keep, they have replaced sheep, which are more dependent on grass species. Thus, the process of deterioration has been accelerated with the increasing number of goats. Some refugees will return to Afghanistan after the civil war stops, but it will take decades to restore the fragile ecosystems of the Province (Cossins 1988). Nearly all rangelands of Balochistan are dry and heavily used, but a few remnants of desirable forage species are still found where they are protected by rocks and bushes (Buzdar and Jamesons 1984).

The above information indicates that the only rangelands available to wild ungulates are the 1.6 million ha that are inaccessible to livestock and other activities.

During his studies in Chitral Gol, NWFP, Aleem (1977) found that the markhor prefer the same species favored by sheep and goats. The effect of livestock grazing is most visible during critical seasons such as severe winters or prolonged droughts. Livestock grazing also creates conflicts between local people and wildlife officials, which magnify management problems. If unmanaged livestock grazing continues, the Province may suffer further degradation of wild ungulate habitats.

**Firewood removal:** Although commercial forestry is not feasible in Balochistan, trees are a source of fuel, traditional timber, animal fodder, and wildlife habitat. Almost the entire population in the Province is dependent upon wood for cooking and heating during winter. A few towns have had natural gas since 1984. The ever-increasing demand for fuel wood to support life, especially in the highlands, has accelerated deforestation, habitat destruction, and habitat alteration for a number of species. The large-scale removal of trees and bushes has changed the composition of plant communities. Animals are losing food and shelter. Local people have rights to collect dead fallen wood for domestic use; however, live vegetation also is taken without any restriction, and competition causes people to take as much wood as they can. The northwest part of the Province, where most of the Afghan refugees settled, supports the majority of wild ungulates such as markhor, Balochistan



urial, chinkara, and goitered gazelle. Thus, the extreme use of the area by refugees for fuel wood has resulted in shrinkage of the habitats of the above-mentioned species. In addition to trees, shrubs and bushes are uprooted, causing serious erosion and permanently eliminating the plants. In many valleys, all the shrubs have been removed and no remnants of desirable plants remain. This large-scale removal of vegetation is triggering soil erosion, leaving behind bare rocks. This process has forced wild ungulates to inaccessible areas. Such areas provide poor forage and are limited in size. These small islands are easy for poachers to locate. Things are getting worse and development projects, if any, are simply holding actions that create a short-term breathing space.

**Habitat encroachment:** A rapidly increasing human population in the Province requires land for housing and an increase in agriculture to feed the growing number of mouths. Cities and towns are expanding. In rural areas, new settlements are being established with the arrival of electricity and extension of communication links. Valleys are being developed for agriculture; in turn, livestock are pushed into inaccessible areas. Consequently, wildlife and its habitats are suffering great pressure. For instance, Surkhab Valley in Pishin District was a wildlife sanctuary a few years ago. This area is now occupied by hundreds of thousands of Afghan refugees and local inhabitants.

Vegetation and wildlife of the area are totally devastated. Ultimately, the provincial government has de-notified the area; now Surkhab area is no longer a wildlife sanctuary.

In the valleys, where sufficient water is available, new settlements are being made, and human populations are increasing by 3 to 9 % annually, mostly from immigration into the orchard-growing areas. Consequently, more land is being developed for new orchards (Rao 1989a). Recently, with the spread of electricity, more wells are being excavated, and lands are being developed for agriculture by encroaching upon previously unoccupied lands. This is the case in Quetta, Pishin, Qila-Saifullah, Sibi, Kalat, and Khuzdar districts, limiting the distribution of wild ungulates into small isolated islands.

**New Roads:** Extension of communication links is important for the economic development of the Province, but it also allows easy access of humans into previously isolated and unexploited areas. Efficient automobiles further facilitate this access. Movement of men and materials into rich wildlife areas may disturb the normal biology of wild species. This also increases human influence over the exploitation of bio-resources and allows poachers convenient access.

Recently, the government has launched a massive program for development of previously isolated areas through extension of communications. Under this program, the

construction of a coastal highway (Liari to Ormara) is in progress. The completion of this highway will link the coastal towns of Gawadar, Pasni, and Ormara with Karachi and other parts of the country, and it will make people of the area more prosperous. It might take decades to develop tourism and to create public awareness of the aesthetic values of natural landscapes and wildlife of the area. However, opening of this previously unoccupied area for human use may be detrimental to wildlife. The highway passes through the center of the newly created Hingol National Park. The park is rich in wildlife, and has unique archaeological sites. Considerable numbers of native ungulates including wild goat, Balochistan urial, and chinkara gazelle are still found in the Park area. During planning for the highway, negative impacts on the biological resources and natural landscape of the area have not been assessed. When this highway opens to the public, it might affect the ungulate species of the Park through increased poaching pressure and competition with domestic livestock. If appropriate steps for the protection and management of fauna and flora of the Park are not taken, the area will face over-exploitation and habitat deterioration because of increased access (Ashiq Ahmed Khan, Pers. Comm.).

## Politics

Politics play an important role in wildlife conservation and management decisions throughout the world. It can be a means for achieving conservation goals, and it can be a hinderance to conservation. The snail darter versus Tellico Dam, spotted owls versus old-growth logging, reintroduction of wolves versus the livestock industry are examples of the role of politics in wildlife conservation in the United States. In developing countries like Pakistan, politics is often a deterrent to wildlife conservation programs. In Balochistan, most of the wildlife management decisions are made by non-professionals, usually under political pressures. The provision of funds is usually in the hands of politicians or non-professionals. Often, decisions are made without regard to the potential effectiveness of a project, due to lack of proper input from professionals.

Other critical situations also affect conservation programs. Communities in Balochistan are based on tribal systems, and some of the tribal areas are politically sensitive. The Government does not want to de-stabilize these areas by creating conflict. Political pressure may place an unimportant project at the top of the priority list, or may shift a project from a productive site to an unproductive one. This type of political pressure may arise

from a single minister, a Member of the National Assembly (MNA), a Member of the Provincial Assembly (MPA), or a tribal chief. In fact, all conservation and development works should be carried out in the interest of the public, not the interest of a single individual. But political preference is 1 of the factors that govern most of the developmental policies in Balochistan. For instance, during 1984-85 and 1985-86, 2 developmental plans for the establishment of national parks were terminated by administrative authorities of the Province because of political conflicts. About 6 million rupees (U.S. \$ 260,000) were spent on those abandoned projects, and the job openings to be created were abolished.

The situation explained above indicates future wildlife conservation efforts will be influenced by politics in the Province. Therefore, wildlife professionals must learn and give special thought to political processes, while dealing with conservation issues.

#### **Lack of awareness**

Public awareness is a critical part of any conservation program. To deal with conservation problems, a change in public values, attitudes, and perceptions toward natural resources is necessary. The public in almost all developing countries is unaware of the importance of wildlife, and such

unawareness especially persists in the relatively underdeveloped Province of Balochistan. Regrettably, the lack of awareness is common even among the educated class. In fact, the major assault on wild ungulates is by this class. It often has been heard from politicians, bureaucrats, and high-level technocrats that, without sufficient drinking water, roads, schools, and health care in the Province, how can we waste money on wildlife without economic return? We don't see wildlife around, how can any investment in wildlife conservation be justified? This attitude indicates a lack of knowledge concerning their own environment. One hears during court trials that the culprit has only killed a markhor or wild sheep -- not a man. Unless people realize the importance of natural resources, we can not expect any positive attitude toward wildlife conservation. The lack of awareness among the masses has created a situation in which hardly anyone pleads for a program to protect wildlife. There is no active lobby or non-government organization that puts the case before the public and influences the allocation of public expenditure for conservation.

Most of the ecologic and economic benefits of conservation are not known to the public. Awareness of potential benefits from conservation of local fauna and flora might change people's attitude toward wildlife conservation.

## Administration

The administrative problems concerning wildlife conservation can be categorized into lack of organization and coordination, scarcity of funds, and low priority.

**Lack of organization:** Until 1967, a separate Game Department administered wildlife protection in Pakistan. In 1967, the Game Department was merged with the Forest Department as a Wildlife Wing. By 1970, the Balochistan Forest Department was supposed to take measures for conservation and protection of wildlife in the Province. This responsibility has been performed through both forestry and wildlife staff. However, the forestry sector is under-staffed, and fully occupied with regular forestry activities. Therefore, it is difficult for them to pay much attention to the protection and conservation of wildlife.

The Wildlife Wing of the Department is still in its initial stage of development. According to the present arrangement, 1 Divisional Forest Officer, Wildlife, is in-charge of Hazarganji-Chiltan National Park, and is also staff officer to the Chief Conservator of Forests, dealing with all wildlife issues and policies concerning the Province. Recently, 2 Assistant Conservator of Wildlife positions have been created, 1 each for Hingol National Park in Lasbela District and for the Game Bird Breeding Farm at Quetta. There are 4 posts of Sub-divisional Officer,

Wildlife, but only 2 are filled. The other 2 posts are unfilled due to lack of potential candidates and problems with the service rules. The majority of the other staff of the Wildlife Wing such as: 4 Rangers, Wildlife, 18 Deputy Rangers, Wildlife, and 296 Game Watchers are serving under the administrative control of the territorial Divisional Forest Officers. They use this staff either for wildlife protection or for forestry work.

The organization of Wildlife Wings in the other 3 provinces of Pakistan has improved considerably. They now have independent Wildlife Departments, but Balochistan, which is mainly wildland rich in wildlife resources, still does not have an organization. The existing wildlife staff is inadequate, untrained, immobile, ill-equipped, and sparsely scattered. The challenges are vast and totally beyond the capacity of the existing organization.

Although a Balochistan Wildlife Management Board was constituted under the Provincial Wildlife Protection Act in 1983, it remains inactive. Also, Honorary Game Wardens were authorized under the Act, and necessary powers were given them to ensure active public participation; however, these powers have never been exercised. Selection of a member for the board and an Honorary Game Warden is usually based on political considerations and the influence of bureaucracy. Therefore, this system has never made any effective contribution to the conservation of wildlife in the



Province.

**Lack of co-ordination:** The second administrative problem is lack of co-ordination among the resource conservation agencies. Usually, the protection and management of natural lands is the concern of only the Forest Department, and no collective approach exists. For example, on the range management issue, Livestock Department personnel believe it is the responsibility of the Forestry sector. On the other hand, Forestry people say it is the concern of the Livestock Department because they have more liaison with herdsmen and they can better manage grazing lands. Thus, during the last 30 years, range management responsibilities were transferred back and forth between these 2 agencies. Within the Forest Department, it is often said that wildlife protection is the responsibility of only the wildlife staff.

Lack of co-ordination and overlapping responsibilities are also common between Federal and Provincial governments and between the judiciary system and conservation agencies. Thus, lack of co-ordination has resulted in serious administrative lapses in the Province.

**Scarcity of Funds and Low Priority:** No conservation program is possible without proper funding. Funds are needed for creation of protected areas, law enforcement, habitat improvement, research, and education. The main source of funding is the Provincial Government, which usually faces shortages of funds or has other priorities such as public

health, agriculture, livestock, water, communications, irrigation, etc. Funds are often withdrawn from the Forest Department after first year successful implementation of a conservation project, because of a shortage of funds in the priority sectors. Following is a brief comparison of funds allotted to developmental programs of the various sectors during fiscal year 1990-91 (Government of Balochistan 1990):

<u>Sector</u>	<u>Allocation in million of rupees</u>	<u>Percentage of total budget</u>
Public Health Eng.	234.6	15.0
Roads	177.2	12.0
Irrigation	154.3	10.0
Education	127.0	8.0
Health	94.0	6.0
Rural Development	88.6	6.0
Agriculture extension	58.3	4.0
Livestock	25.4	2.0
Fisheries	12.3	1.0
Agriculture Eng.	11.5	0.7
Forestry	3.5	0.2
Wildlife	1.3	0.1
Others	532.0	35.0

The above comparison shows that the least amount was allocated for the Forestry and Wildlife sectors and indicates the priorities of the Government. The major hurdle in obtaining sufficient funds is the belief that wildlife

has no economic value and does not yield immediate financial returns compared to other sectors. Malik (1987) reported similar problems obtaining funds in NWFP. However, developed nations like the United States and Canada, who manage their wildlife resources, realize an annual economic return of 60 billion U.S. dollars from wildlife and wildlife-related industries for both countries (Geist 1988). This amount is far more than the total annual budget of Pakistan.

Unfortunately, natural resource conservation is not on the priority list of aid-giving agencies such as the World Bank, Food And Agriculture Organization (FAO), United Nation Development Program (UNDP), and United States Agency for International Development (USAID). Inadequate funding is limiting all conservation programs that are crucial for monitoring distribution, status, and habitat condition of wild ungulates in Balochistan. Therefore, a poor organizational system, lack of co-ordination, and scarcity of funds are the major administrative drawbacks to wildlife conservation efforts.

#### **Shortage of trained staff**

The Wildlife Wing of the Forestry Department is in its initial stage of development. Without trained staff, it is handicapped for conducting the necessary surveys of wild animals and their habitats. The current status and

distribution of wild ungulates is difficult to know unless the existing staff is trained in the basic ecology and behavior of the animals to be surveyed. Basic data are required to develop comprehensive management plans for each species. The limited information on status and distribution of species makes it difficult to control poaching. In some cases local "shikaries" know much more about the number and distribution of big game than do wildlife personnel of the area. When basic knowledge concerning seasonal movements and habitat use by wild ungulates become available, necessary actions can be taken to provide protection and to use other management strategies for the conservation of wildlife in the tribal areas.

Inadequacy of trained manpower in Pakistan was first realized in 1969 (Grimwood 1969). Later on, the recommendations of the Wildlife Enquiry Committee also emphasized the importance of trained staff for better management of the Country's wildlife resources (Govt. of Pakistan 1971). After more than 20 years, the situation has not improved. There are only a few people in the Country who have adequate professional training in wildlife science. The situation in Balochistan, where no one has advanced training in the field of wildlife management, is much worse than in the other provinces. All existing staff in the Wildlife Wing require proper training in the field of wildlife sciences. Recently, while reviewing natural resource conservation in

Pakistan, the National Agriculture Commission again warned about the acute shortage of trained manpower in the field of wildlife management (Government of Pakistan 1988).

Shortage of trained manpower is one of the major barriers to conservation of wildlife in the province. If we are interested in managing our wildlife resources scientifically, we must take steps to develop trained manpower.

## Chapter III

### **WILD UNGULATES: STATUS AND MANAGEMENT**

This chapter is devoted to management of each wild ungulate species found in Balochistan. Salient features, distribution, status, and existing management for each species have been described. The uncertain taxonomic status of some species has also been discussed. The management problems of most of the species are almost the same as those of overall conservation problems described in chapter II. At the end of each section, management objectives and recommendations have been proposed.

#### **Markhor (Capra falconeri)**

**Family : Bovidae**

**Sub-family : Caprinae**

#### **Taxonomic position:**

Seven sub-species of Capra falconeri were recognized by Ellerman and Morrison-Scott (1951); among them , 5 are found in Pakistan (Roberts 1977). Based on similarities in horn shape, Schaller and Khan (1975) divided them into 2 groups. They placed Astor and Kashmir Markhors as the flared-horned markhor (C. f. falconeri) and the Kabul and Suleiman

markhors as straight-horned markhor (C. f. megaceros). Schaller and Khan concluded that the fifth sub-species, chiltan markhor is neither a markhor nor a hybrid as suggested by (Roberts 1969, 1977). They recognized this animal as a sub-species of wild goat (C. aegagrus).

Geographic variation in horn shapes and other morphological characters are often used to designate different sub-species of markhors. However, the overlap in some of their geographic ranges and slight variation in morphological characters have created confusion in the taxonomic status of these sub-species. It seems there is no constancy in these characters, even within a population.

In this plan, I follow Schaller and Khan (1975), and consider both Kabul and Suleiman markhor as straight-horned markhor (C. f. megaceros), but I retain chiltan markhor as C. f. chiltanensis (see separate account on page 60). The other 2, Kashmir and Astor markhors (C. f. falconeri), are confined to NWFP, Northern areas, and Azad Kashmir. Therefore, they are not discussed in this plan.

#### **Straight-Horned Markhor (C. f. megaceros)**

**Salient features:** Like other Capra spp., straight-horned markhors have massive shoulders, a broad chest, and powerful legs. An adult male is 89 cm at the shoulder and 132 cm in body length (Stockley 1926 as quoted in Roberts 1977). There

is no recorded body weight for this species. The general body color varies from brown to reddish-gray and grayish with yellowish-buff tones in the summer coat and more grey in winter. Adult males have a short ruff of hair on their necks and chests. Both sexes have a dorsal dark brown stripe extending from their shoulders to the base of the tail and another from chin to chest. Mature males have black beards, but females do not show any beard. The horns in males grow straight in a tight spiral, and horn twist varies from open to tight, resembling a corkscrew. The horn length varies with age reaching up to 123 cm (Prater 1980). Mature females are smaller in size than males and have horns from 15 to 18 cm in length with only 1 twist in their distal portion (Roberts 1977).

The rut starts in late October and lasts up to late November. The gestation period is 166-170 days, and young are born in late April or early May. The normal age of females at first reproduction is 36 months (Roberts 1977).

**Distribution:** Markhors are found in southern USSR, northeast Afghanistan, the northeastern Himalaya system, and southwestern ranges of Pakistan (Schaller and Khan 1975). Most of the world's remaining populations of markhors are now confined to Pakistan. Straight-horned markhors have discontinuous and limited distribution. They mostly occur in southwestern NWFP and north and northeastern Balochistan (Valdez 1985). In Balochistan, they are found in small



isolated populations scattered in Koh-i-Suleiman, Toba-Kakari Range along the Afghan boarder, and Takatu Hills north of Quetta. No detailed survey has been conducted to determine the present distribution of this species in its former ranges. In the recent past, this species was abundant in the mountains of Gurshani, Zarghun, Phil Ghar, Khalifat, and Shingar, but there is no information about its present distribution in these mountains. However, the presence of a few populations in Koh-i-Suleiman, Takatu Hills (Khan 1989), and Torghar hills of the Toba-Kakari Range have been confirmed (Tareen 1990). Fig. 5 shows the distribution of straight-horned markhor in Balochistan.

**Status:** Roberts (1969) estimated the total population of straight-horned markhor in Takhet-i-Suleiman, the Toba-Kakari Range, Takatu Hills, Khalifat, Zarghun, and Murdar at little more than 1000, and he warned that the species is severely threatened as a discontinuous population in isolated pockets. Schaller and Khan (1975) concluded that about 1000 straight-horned markhor persist in Balochistan and adjacent areas of NWFP. Schaller (1977) estimated around 2000 straight-horned markhors throughout their entire range in Pakistan and Afghanistan. Since then, no comprehensive survey has been undertaken to estimate the present status of this species. However, during the last 2 decades the species has been depleted greatly due to excessive hunting and severe habitat loss, and its numbers have been reduced at an

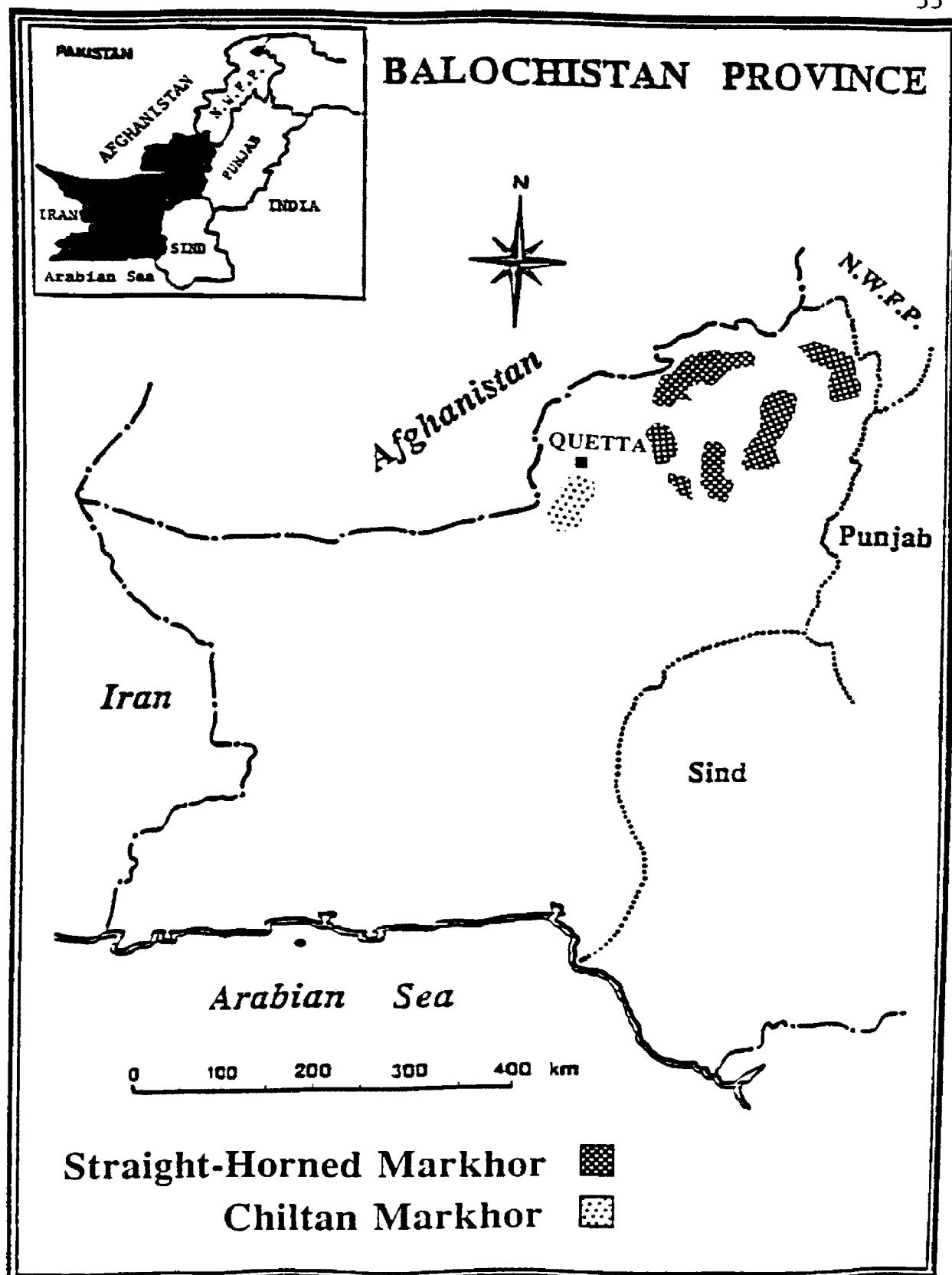


Fig. 5. Distribution of straight-horned and chiltan markhor in Balochistan.

alarming rate. During spring 1989, the staff of the Forest Department surveyed 8 % of the total 1287 km<sup>2</sup> area of Torghar hills, and 22 animals were seen in 3 days. Khan (1989) reported that 100 and 50 straight-horned markhor still exist in Koh-i-Suleiman and Takatu Hills, respectively. Due to recent protective measures in Takatu Hills and the Koh-i-Suleiman area, the population is increasing slowly (A. A. Khan, pers. commun.). Similarly, with the start of the private Torghar conservation and utilization project, the number of straight-horned markhor is increasing (N. A. Tareen, pers. commun.). Although the situation seems to be improving, their numbers are still low. Presently, no total estimate of numbers is available, but I am sure wherever this animal survives, it has a limited distribution in small island populations. Due to its dwindling status, the straight-markhor is listed as an endangered species in the "Red data list" of IUCN (1988).

**Existing Management:** As a first step for the protection of the straight-horned markhor, it was included in the third schedule of Balochistan Wildlife Protection Act, and its killing, hunting, and possession were declared unlawful. However, this law was seldom enforced due to lack of supervisory staff and inapplicability of the Act on the provincially administrated tribal areas. However, the jurisdiction of the Act has been extended over all the tribal areas of Balochistan since 1980. A few Game Watchers

and Deputy Rangers were appointed in the Zhob Division. In addition to this, 9 additional game watchers were appointed in Takatu hills, and Ziarat Juniper Wildlife Sanctuary was declared with some protective staff, basically for the protection of straight-horned markhor. These steps did not bring fruitful results. The Game Watchers appointed for the protection of the markhor aided in poaching and illicit grazing. The situation was further aggravated due to increased livestock and poaching pressures. Unfortunately, no protected area was created in the entire range of this species in Balochistan. Thus, protection and management of the straight-horned markhor remained neglected. Recently, the government has realized the situation, and a development scheme for the establishment of the Takatu area as a national park has been executed. A private wildlife conservation and utilization project has also been launched by the tribal leaders in Toba-Kakari Range. Since 1986, Shikar Safari Club International has donated about U.S. \$ 30,000 to the Balochistan Forest Department for the conservation of straight-horned markhor in the Province. This amount has been spent in Koh-i-Suleiman and Takatu areas for the conservation of this species by involving local people. Presently, a preliminary study for the protection and management of the whole Koh-i-Suleiman area is under way with the financial assistance of WWF international. It is hoped that such steps may save this

species from extinction and help to rebuild populations in its former ranges.

**Management objectives:**

1. Save the straight-horned markhor from extinction and build its populations to a level where it will survive and reproduce successfully.
2. Increase the overall numbers of the markhor to a level where sustainable harvest could be conducted without deleterious effects on the populations.
3. Involve tribal communities in the conservation efforts for this species by providing job opportunities and other economic incentives, i.e. a share of revenue from a markhor trophy hunting program after restoration of their populations.

**Management recommendations:**

1. A comprehensive survey to determine the current distribution and status of straight-horned markhor in Balochistan should be conducted in its entire former range. Presently, this species is found as small island populations in isolated and inaccessible mountains. Thus, an aerial survey would be the best option.
2. Potential habitats should be identified for the management of straight-horned markhor populations, and possibilities for launching conservation and sustainable utilization projects should be studied.
3. The Takatu area should be declared as a national park

without further delay. The area is relatively small and in proximity to the provincial capital. Thus, rigid protection would be required by involving local tribes. The experience gained from the management of Hazarganji-Chiltan National Park can be applied for the success of Takatu National Park.

4. At least 1 potential area in the Suleiman Range should be declared as a markhor refuge with management zones taking into account the requirements of the native people. Areas that are extensively used by markhors should be identified and designated as core management zones.

5. Hunting of straight-horned markhor should be banned for the next 5 years or until improvement in the endangered status of this species. However, the provincial government may consider special situations for cropping 1 or 2 trophy animals once in 2 years to meet the financial needs of a specific conservation and utilization project. Such permissions should be made after careful assessment of the markhor population in the project area and with the mutual understanding of CITES authorities.

6. Law enforcement in tribal areas is poor, and should be strengthened to control illicit hunting and poaching by involving tribal chiefs, mobilizing wildlife staff, and establishing anti-poaching check stations in Zhob and Quetta divisions.

7. Ecological research to provide complete descriptions of daily, seasonal, and yearly habitat use by the straight-

horned markhor should be conducted to determine the management requirements for this species. Nothing is known about natural predators and their relation with markhor populations. A study to determine the effects of predation on the markhor populations should be conducted with the help of leading research institutes in the field of wildlife sciences.

8. Annual surveys of markhor populations in Takatu, Koh-i-Suleiman, Shinghar, and Toba-Kakari ranges should be conducted. Population structure and mortality and fecundity rates should be monitored properly.

9. Although 1 private conservation and utilization project has been launched in Toba-kakari Range, this is not enough to establish populations of this species throughout its former range. The other potential areas should be identified and concerned tribal communities should be convinced to start similar projects. However, active involvement of government agencies in the technical and management decision making process would be essential for over-coming technical problems.

10. The numbers of Game Watchers and supervisory staff should be increased in Zhob, Qila-Saifullah, Loralai, and Ziarat districts. The anti-poaching measures in these areas should also be strengthened.

11. Over-grazing, which has not only denuded the hills and steep slopes but also has resulted in the direct destruction

of natural vegetation, is a serious problem in markhor habitats. Over-grazed areas can be rehabilitated by taking the following steps:

- a) All livestock grazing should be excluded gradually from the core habitat zones of the markhor.
- b) An appropriate grazing system should be introduced on the lower slopes, and tribal people should be encouraged to replace goats with sheep because sheep cause less harm to vegetation of the area.
- c) Removal of green trees and bushes from markhor habitats must be stopped.

#### **Chiltan markhor (C. f. falconeri)**

**Taxonomic position:** Much controversy exists regarding the taxonomic status of this animal. Lydekker (1913 cited by Schaller 1977) first described it as a distinct sub-species of markhor, C. f. chiltanensis. Roberts (1969, 1977) and others suggested that chiltan goat may be a hybrid between the straight-horned markhor and Sind wild goat (C. a. blythi). Schaller and Khan (1975) and Schaller (1980) concluded that the chiltan goat is neither a markhor nor a hybrid but a sub-species of wild goat (C. aegagrus) with distinctly shaped horns. Valdez (1985) considered it as a sub-species of markhor (C. falconeri).

Various authors used horn shape as a criterion for



describing different sub-species of Capra (Schaller and Khan 1975, Roberts 1977, and Corbet 1978). This criterion may not be suited for describing the animal found in the chiltan range, because there is great variation in the horns even in a group of males from a single population. A recent photograph of a group of males taken in Hazarganji-Chiltan National Park during 1990 shows much variation among horns of these animals (Fig. 6). Whatever this animal is, a markhor, wild goat, or hybrid, its taxonomic status still requires detailed scientific studies up to the level of DNA structure and behavioral characteristics. I will treat this animal as the chiltan markhor (C. f. chiltanensis).

**Salient features:** Information on body size and body weight of chiltan markhor is not available. However, a few scientists have described the body color, horn shape, and horn size of this animal. The pelage color of adult males is light brownish-gray in the mid dorsal and shoulder regions. Some males have a darker brown chest extended as a shoulder stripe. Males have short black beards, but the ruff is almost absent. Females are reddish-gray with a dark brown dorsal stripe from shoulder to rump and have creamy white legs (Roberts 1977). Schaller and Khan (1975) described the pelage of males during the rut as light in color with black markings and lacking a ruff, which resembles the wild goat (C. aegagus). The horns sweep up and backwards, strongly



Fig. 6 : A group of male Chiltan Markhors in Hazarganji-Chiltan National Park showing variation in horns shape.

keeled outward with a flat inner surface facing horizontally upwards, and tips turning inwards. Normally, horns are less than 1 complete spiral, but a complete spiral is sometimes observed. Horns rarely measure more than 74 cm (Roberts 1977). I have measured a length of 89 cm over the curve of a trophy in Quetta in 1988, and Schaller (1977) reported a 91 cm length as the world record.

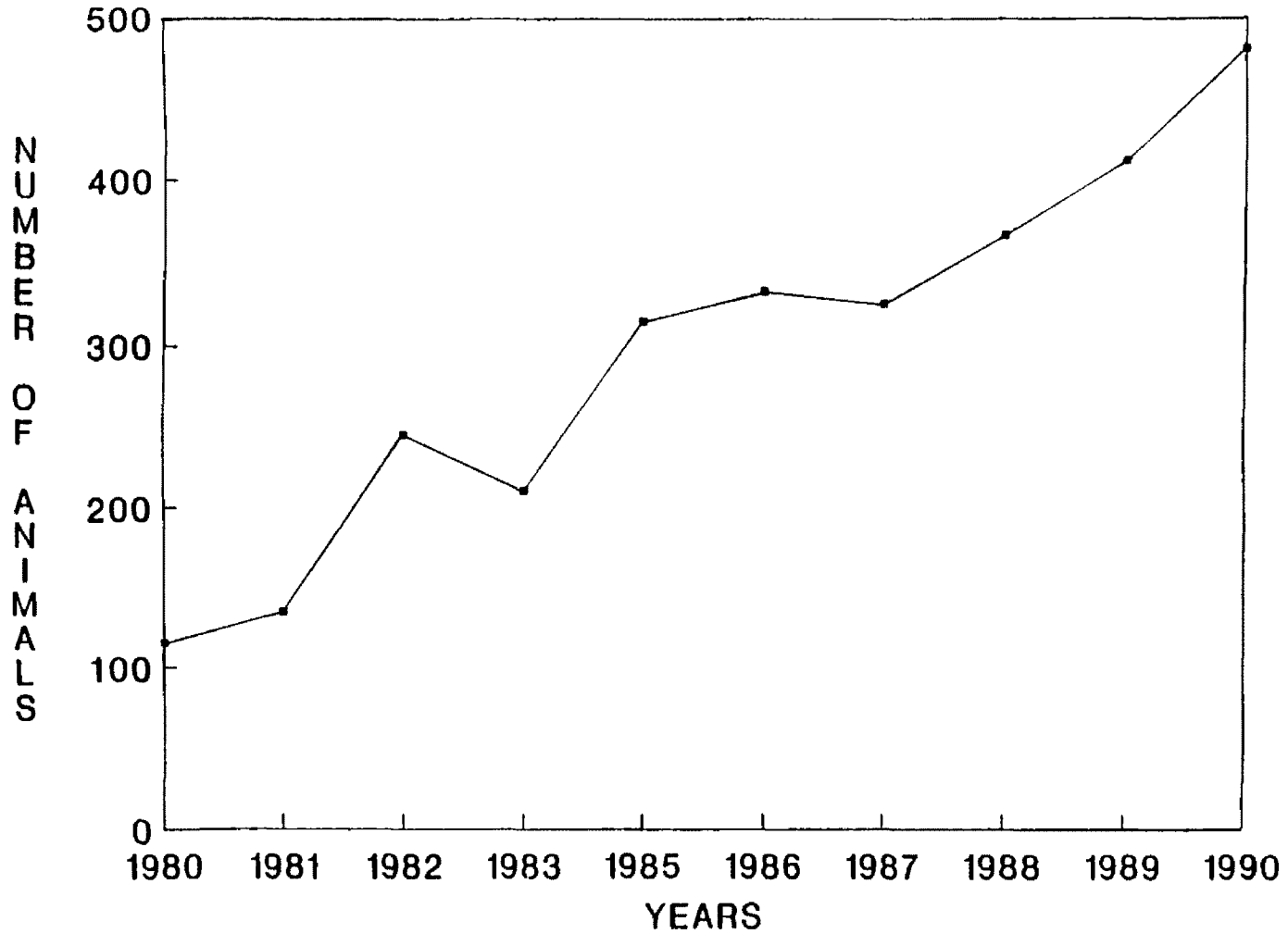
Mating takes place from late October to late November with a peak during the first half of November, and young are borne in late April or early May. The gestation period is believed to be 160 days, litter size is usually 1, but twins occasionally occur.

**Distribution:** In the recent past, the chiltan markhor was found in the Chiltan Range, Murdar, Koh-i-Maran, and Koh-i-Gishk (Schaller 1977). The numbers and distribution of this species have drastically declined, largely due to poaching and competition with domestic sheep and goats for forage. No recent survey has been conducted in Koh-i-Maran, Koh-i-Ghisk, or Murdar. According to reliable information, the entire populations of these areas have been wiped out. Presently, this species is confined to the Chiltan Range, mostly within the boundaries of Hazarganji-Chiltan National Park southwest of Quetta (Fig. 5). This remnant population is totally isolated because of roads, heavy human settlement, and intensive agriculture on the periphery of its range.

**Status:** In the 1940s, this markhor was said to exceed 1200 animals (Rana 1981), but Schaller and Mirza (1971 cited in Roberts 1977) estimated a total of about 200 individuals (107 animals were actually seen) in the entire Chiltan Range. No survey was conducted between 1970 and 1978. It has been reported that the above numbers dropped to 80 in 1978 (Hamid Ali pers. commun.). When the government of Balochistan realized the importance of this species, it established Hazarganji-Chiltan National Park in 1980. Rigid protection from poaching and livestock grazing was enforced. Since 1980, the Balochistan Forest Department with collaboration of PFI have made various annual counts in the National Park area. The results reveal that the population of this unique species increased from 115 individuals in 1980 to 480 in 1990 (Balochistan Forest Department records, Fig.7).

**Existing management:** Chiltan markhor received considerable attention compared to the straight-horned markhor in the north. In 1959, the Hazarganji area was declared as a game reserve, and a few Forest Guards and Game Watchers were appointed for protection from grazing and poaching. These measures did not provide rigid protection against illicit grazing and poaching. As a result, the habitat became degraded and the markhor population decreased to very low numbers. Later, with the enactment of the Balochistan Wildlife Protection Act in 1974, the chiltan markhor was

# ANNUAL COUNT OF CHILTAN MARKHOR



No survey was conducted in 1984.

Fig. 7. Annual population increase of chiltan markhor in Hazarganji-Chiltan National Park, Balochistan, Pakistan.

declared a protected animal , and the Hazarganji-Chiltan area was designated as a Wildlife Sanctuary in 1974. Grazing and wood cutting were strictly controlled. However, poaching continued due to the proximity of the area to Quetta.

Meanwhile, the Koh-i-Gishk area of Kalat district was also designated as a Wildlife Sanctuary in 1974, and a few Game Watchers were appointed from local tribes for the protection of the area. Although Koh-i-Gishk is still a Wildlife Sanctuary, protection from grazing and poaching is ineffective. However, the status of the Hazarganji-Chiltan area was upgraded to a National Park in 1980. Special attention was given to the protection of the markhor and its habitat. The following steps were taken for the preservation of chiltan markhor:

1. The number of Game Watcher were increased from 5 to 13.
2. Administrative staff was increased by appointing a full time Divisional Forest Officer, Wildlife, along with all necessary staff for the proper management of the area.
3. Livestock grazing , wood cutting , and poaching were strictly controlled, and about 30 km of barbed-wire fence was erected along the lower boundaries of the National Park to provide protection for the markhor habitat from livestock grazing.
4. Springs and natural water points were cleaned periodically (debris is removed to provide more water

for animals), and necessary steps were taken for the recovery of vegetative cover in the Park.

6. To compensate local tribes for the loss of their traditional livestock grazing and fuel-wood gathering, they were involved in the management of the area through job opportunities as alternate sources of income. Almost the entire staff belong to the local tribes living on the periphery of the National Park.

The results of the above steps are remarkable. All local tribes now take interest in the protection of the area, and consider it as a source of regular income for their families. The number of known poaching incidents is almost zero. The markhor population is flourishing and vegetative cover in the markhor habitat is improving.

**Management objectives:**

1. To increase and manage a healthy population of chiltan markhor in the Chiltan Range that will enhance the aesthetic values of wildlife in the Province, particularly wildlife viewing in the Hazarganji-Chiltan National Park.
2. To re-establish populations of this species in Koh-i-Gishk and Koh-i-Maran by transplanting a few animals from the population in the National Park or by establishing captive stock for reintroductions.
3. To elucidate taxonomic status of chiltan markhor by

conducting taxonomic studies.

4. To involve the local people inhabiting areas around Koh-i-Gishk Wildlife sanctuary in a reintroduction and management program by providing them economic incentives.
5. To restore the population of chiltan markhor in its former ranges to a level where sustained annual harvests through a trophy hunting program could be made without jeopardizing the survival of this species.

**Management Recommendation:**

1. The area of Hazarganji-Chiltan National Park (15,555 ha) is too small to support the growing numbers of chiltan markhor. It should be increased by including the adjacent Kerkhasa State Forest and other hills of the Chiltan Range lying to the north of the Park, increasing the carrying capacity of the Park area.
2. Presently, the National Park is the only place that harbors chiltan markhor. This is a closed population, and population increases may lead to over-crowding. According to Ralls et al. (1986) over-crowding increases the chances of mating between closely related individuals, and populations may suffer from inbreeding depression. Moreover, as the population becomes concentrated, the threat of epidemic outbreaks also increases (Dobson and May 1986). Therefore, to avoid future over-crowding in the National Park, a separate population either in Koh-i-Gishk or Koh-i-Maran



should be established through a reintroduction program. Necessary steps should be taken to manage Koh-i-Gishk Wildlife Sanctuary for reintroduction of chiltan markhor by transplanting a few individuals there. This will help to establish a separate deme, and might reduce the chances of a stochastic event causing catastrophic reduction in the population.

3. Prior to any reintroduction program, the availability of various habitat components and their preference by the chiltan markhor should be determined. This can be done by habitat evaluation techniques and the non-mapping techniques described by Marcum and Loftsgaarden (1980).

4. Present studies on population dynamics of chiltan markhor should be continued, and annual birth and death rates should also be monitored. That would help in developing further management strategies for this species.

5. All watering points in the markhor habitat (natural holes, ponds, depressions, and springs) should be located and marked, and necessary cleaning or maintenance of these points should be carried out periodically.

6. The taxonomic status of this species is uncertain and nothing is known about its ecology. Research on taxonomic status and ecology of chiltan markhor should be undertaken. Food habits of the markhor should be analyzed, and plant species eaten as well as species abundance should be included in the studies to establish a preference index. In

view of the shortage of research scientists in the country, collaborating with foreign universities and providing facilities to graduate students for such research would be advisable.

7. The provincial government can not fully support the wildlife conservation programs in the Province. However, when the population of chiltan markhor increases to a reasonable level, annual harvests of 2-3 animals through international trophy auctions could supplement funding for training, research, technical literature, and necessary equipment required for wildlife conservation programs in the Province.

8. If trophy hunts are sanctioned, measurements, weights, information on color, and horn configuration should be gathered from each trophy animal.

**Wild Goat (C. aegagrus)**

**Family : Bovidae**

**Subfamily: Caprinae**

**Salient features:** The wild goat, locally known as the Sind Ibex, is a stocky animal and has strong legs with broad hooves. Edge and Olson-Edge (1987) described average body measurements for both sexes of Sind ibex. According to their measurements, adult males average 131 cm in length, 70 cm at the shoulder, with tail 9.1 cm and body weight of 44 kg.

Adult females are smaller in size and body weight. Mature males are brownish-gray, but old males are lighter with dorsal dark stripes from nape to the base of the tail and a cross stripe down each shoulder. The Summer coat is reddish-brown with short hairs. In mature males, the beard is black to chestnut-brown, but a beard is absent in females. Well developed horns in males measure 102 cm over the curve, but horns in females are short, measuring up to 15 cm (Roberts 1977). The record length of horn of a specimen collected from the Kirthar Range is 133 cm (Roberts 1977).

The timing and duration of the rut varies in southern and northern populations. In the southern areas, the rut occurs from late August to early October, and young are born from late January to the end of March. In the higher mountain ranges of Kalat and Raskoh, the rut takes place in November and early December, and young are born in April and May (Roberts 1977). Wild goats usually produce a single offspring, but twins are not uncommon.

**Distribution:** Like other Capra spp., wild goats are pre-eminently adapted to arid mountain regions, with precipitous slopes and vertical cliffs. This species has a very wide geographic distribution. It occurs in eastern Turkey, northern Iraq, most of Iran, southern Afghanistan, and southern Pakistan (Valdez 1985). On the Balochistan plateau, it inhabits almost all the higher mountain ranges of the south from sea level at Ormara to an elevation of 3000 m in

the Raskoh hills in Kharan, Harboi Hills, Koh-i-Maran, and Koh-i-Gishk in Kalat District (the northern extreme range of this species). However, most of the populations survive only in small inaccessible areas as island populations because of indiscriminate hunting and severe competition for food with domestic sheep and goats. In the past, the occurrence of wild goat in Gadabar Ghar in Loralai District and in Bolan pass along the Quetta-Sibi highway was reported, but they are now possibly extinct from those area (Schaller 1977). According to reliable accounts, areas such as Dhrun and Hingol in the Central Mekran Range, and the Dureji hills in Lasbela District still harbor scattered populations of wild goats. Possibly, small populations also survive in the Raskoh Range of Kharan and Harboi hills of Kalat. Fig. 8 shows the distribution of wild goats in Balochistan.

**Status:** Unfortunately, no systematic population surveys have been undertaken due to lack of staff and the wide range of distribution of wild goats in Balochistan. Thus, very little is known about the current status of this species. However, Khan and Beg (1989) reported that the wild goat is still found in good numbers in Dhrun and Hingol areas. This can be judged from kills of wild goats in those areas. In 1986, 1 hunting party took more than a dozen wild goats in the Dhrun area during 1 hunting trip. In 1988, another hunting party shot 18 animals in the Hingol area with automatic weapons on a 3-4 days hunting trip. The situation

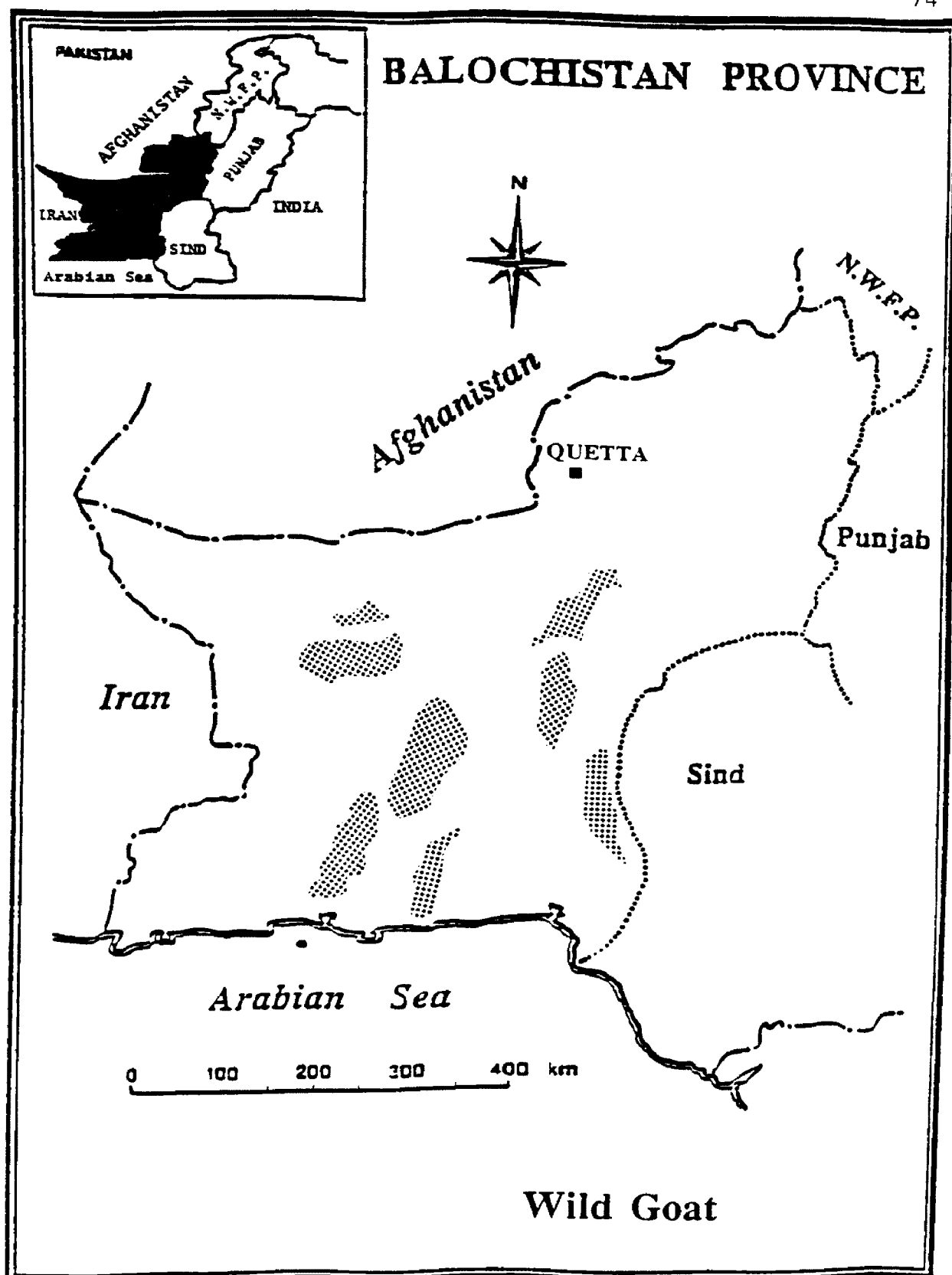


Fig. 8. Distribution of wild goats in Balochistan.

in Dureji area is a little better because the local tribal chief strictly controls hunting. About 200-300 animals now live in this area (Gul Muhammad, pers. commun.). This population also migrates between the Kirthar Range of Sind Province and the Dureji hills. Reliable information indicates that a few dozen wild goats may be met in Raskoh Wildlife Sanctuary and on Koh-Paidar Mountain of the Chaghai hills. The population found on the peninsula of Ormara is almost extinct due to indiscriminate hunting, mostly by coastal guards (Gul Muhammad, Pers. Commun.). There is no information about the current status of wild goats in Kachau, Shashan, Chorani, or Kolwah Kap wildlife sanctuaries in Khuzdar District. Similarly, nothing is known about the situation in Khurkhara (Lasbella District) and Buzi Makola (Gawdar District) wildlife sanctuaries. I believe if a few animals survive in those areas, they form small isolated sub-populations in remote localities.

**Existing management:** The wild goat has been declared as a protected animal, and included in the third schedule of Balochistan Wildlife Protection Act of 1974. Management practices adopted for this species were inadequate and law enforcement was poor. In spite of the protection of this species by law, poaching continued in its entire range in the Province. This is particularly true in Khuzdar and Lasbela districts, due to easy access by poachers from Karachi (capital of Sind province). Although 9 Wildlife

Sanctuaries (Koh-i-Gishk, Kachau, Shashan, Chorani, Dureji, Rughia Rakhshan, Kolwah Kap, Buzi Makola, and Raskoh) have been designated in the potential habitats of wild goats, these sanctuaries have never been managed properly. No management plans were developed for improvement in these areas, and most of these sanctuaries even lack supervisory staff. Protection is the responsibility of Game Watchers, most of whom are not regular in performing their duties, and there is no periodic check up on them. Thus, protection of the flora and fauna of these sanctuaries is inadequate, and most sanctuaries exist only on paper.

From 1985 to 1987, a development scheme, "Preservation of wild goats in Raskoh hills", was executed. The status of Raskoh Game Reserve was upgraded to Wildlife Sanctuary. The number of Game Watchers was increased from 6 to 12. A position of Wildlife Ranger was created and some habitat improvement work was carried out. This scheme was unsuccessful due to improper handling of the project and lack of interest from management authorities. During 1988, Hingol and Dhrun areas were declared as national parks. Fifteen Game Watchers and other supervisory staff, including an Assistant Conservator of Wildlife, were posted for the protection and management of wildlife resources in both national parks. Some habitat improvement was carried out, and a few water points were developed. These national parks are in the early stage of development, and it is difficult

to make a conclusion about the improvement in flora and fauna. However, it has been reported that the number of poaching incidents decreased considerably (M. Shafique, pers. commun.).

**Management objectives:**

The following broad objectives for the management of wild goats are proposed:

1. To determine the current distribution and status of wild goat populations in the Province, and to establish an annual population monitoring system.
2. To increase and manage healthy populations of wild goats in the areas of its occurrence, with the ultimate objective of sustainable utilization of this resource through trophy hunting. To provide meat hunting to local people when wild goats are abundant enough to sustain subsistence hunting.
3. To involve local people in the conservation and management of this species.

**Management recommendations:**

1. Immediate steps should be taken to conduct systematic surveys throughout the potential habitats of the wild goat and determine the current distribution and status of this species in Balochistan. Most of the remnant populations of wild goats are confined to isolated and inaccessible localities in the Central Brahui and Central Mekran ranges. These mountain ranges spread over broad geographical areas,



and using ordinary means and resources for such survey work is difficult. Therefore, aerial surveys of wild goats and their habitats would be the best option for monitoring the current distribution, status, and potential habitats of this species. The aerial surveys should be carried out in 2 phases. The first phase should be started in Hingol and Dhrun national parks. The second phase of surveys in the wildlife sanctuaries such as Raskoh, Koh-i-Gishk, Dureji, Chorani, and Kolwah kap should be prepared in the light of experience gained during the first phase.

2. After determining the potential habitats of wild goats in the above mentioned areas, necessary management plans should be developed for the conservation of wild goats and other wild life resources of each area. Most of the wildlife sanctuaries in Kalat and Mekran divisions were created haphazardly, without any planning or survey work or ecological considerations. The status of such sanctuaries should be reviewed after studying the biological potential of the area. If found necessary, a proper management plan should be developed for the each wildlife sanctuary.

3. Poaching of wild goats is a serious problem in all of their habitats. It should be strictly controlled by appointing necessary supervisory staff and conducting raiding parties periodically. Cooperation of the local people in anti-poaching and conservation efforts should be sought by providing economic incentives similar to those

proposed in previous chapters.

4. Habitat rehabilitation work should be carried out in the areas that are severely degraded. Efforts should be made to gradually exclude all livestock grazing and fuel-wood removal, at least from the core habitat zones. Watering points such as natural ponds and depressions in Dhrun and Hingol national parks should be identified and maintained. The construction of additional water points in both national parks would probably help to restore wild goat populations. A few watering points in such a vast area are insufficient, because goats usually concentrate on those few holes and become vulnerable to poaching.

5. Koh-i-Gishik, Kachau, Shashan, Chorani, Dureji, Rughia Rakhshan, Kolwah Kap, Bazi Makola, and Raskoh wildlife sanctuaries are key wild goat habitats in southern Balochistan. Local people living inside and around these sanctuaries should be involved in the management of these areas. They should be informed that effective protection and management of goat populations could bring several benefits for them. Conservation could be much more effective if local tribal chiefs of these areas were given input into the management process.

6. Before initiating any conservation and management project for the wild goat populations in the Province, necessary feasibility studies should be made. Past experience shows that projects executed without such studies

were unsuccessful for establishment of Horboi National Park and preservation of ibex in Raskoh hills. The findings of the study on ecology of wild goat in Kirthar National Park, Sind could be helpful for such management projects (Edge and Olson-Edge 1987).

**Balochistan Urial (Ovis vignei blanfordi)**

**Family : Bovidae**

**Subfamily : Caprinae**

**Taxonomic position:**

The taxonomic position of the Balochistan urial as a subspecies is uncertain. Roberts (1977) calls it O. orientalis blanfordi. Schaller (1977) considered it O. o. cycloceros, and Valdez (1982) described O. o. blanfordi as synonymous with O. o. cycloceros. Corbet (1978) included this animal in a polytypic taxon O. ammon. Honacki et al. (1982) placed it as a full species O. vignei along with other populations of southwest Asia. More recently, R. Valdez (pers. commun.) concluded that the epithet orientalis should be rejected because it was based on a hybrid, and according to the rules of zoological nomenclature, a species can not be established on a hybrid. In this plan, I have followed this conclusion and call this species O. vignei blanfordi.

**Salient features:** The Balochistan urial is characterized as

a thin and long-legged wild sheep. The adult male has a height of 75 cm at the shoulder; body length of 138 cm and body weight of 36 kg (Edge and Olson-Edge 1987). The mature male carries a long and flowing neck ruff of white and black hair; the horns often develop to a complete circular arc (Roberts 1985). The body color is reddish and the saddle markings in males are absent. The longest recorded horn measured 105.5 cm. Females are smaller in body size and have cylindrical horns about 13 cm long.

The rutting season is from early October to mid-November. The gestation period is about 160-164 days, or may be shorter, and the age of females at first reproduction is about 2 years. Young are borne during early March to late April. Females usually give birth to a single lamb but twins are also reported (Roberts 1977).

**Distribution:** In Balochistan, urials are widely distributed from the Mekran coast in the south to the Suleiman range in the north-east corner. They have a sympatric distribution with both straight-horned markhor and wild goat, but urial separates its niche by using different slopes. Wild goats and markhor prefer rugged cliffs with steep slopes, while urial occupy plateaus and hills with gentle slopes (Schaller 1977). No detailed surveys have been conducted to determine the distribution of urial in the Province. However, reports indicate this species subsists only in remote pockets. Throughout its range, it faces severe hunting pressure and

competition with domestic sheep and goats. According to reliable accounts, the urial is still found as small sub-populations in remote areas of Dureji, Hingol, Dhrun, Kolwah Kap, Buzi Makola, north east of Kalat, Toba-Kakari range, and Takatu hills near Quetta. Fig. 9 shows the distribution of urial in Balochistan.

**Status:** Because of severe poaching pressure, habitat degradation (from over-grazing and fire-wood removal), and habitat encroachment, the urial exists as extremely scattered and small populations, making the conservation task difficult.

The overall status of the urial in Balochistan is undetermined. However, some authors have made estimates for some areas. Roberts (1985) reported that about 2500 - 3000 urial were found in its entire range in Balochistan. Mitchell (1988), based on surveys and reports from game guards, estimated that about 1000 urial inhabit the Torghar hills of Toba- Kakari range, with a density of 1 animal/ 5.0 km<sup>2</sup>. In a similar area, the staff of the Forest Department conducted a sample survey at 5 localities during September 1989. A total of 27 urial were actually seen in 3 days. Taking into account the total area under Torghar Conservation Project, my conservative guess would be that little more than 300 urial exist in the area. Tareen (1990) reported that the combined population of straight-horned markhor and urial in Torghar hills is well above 400

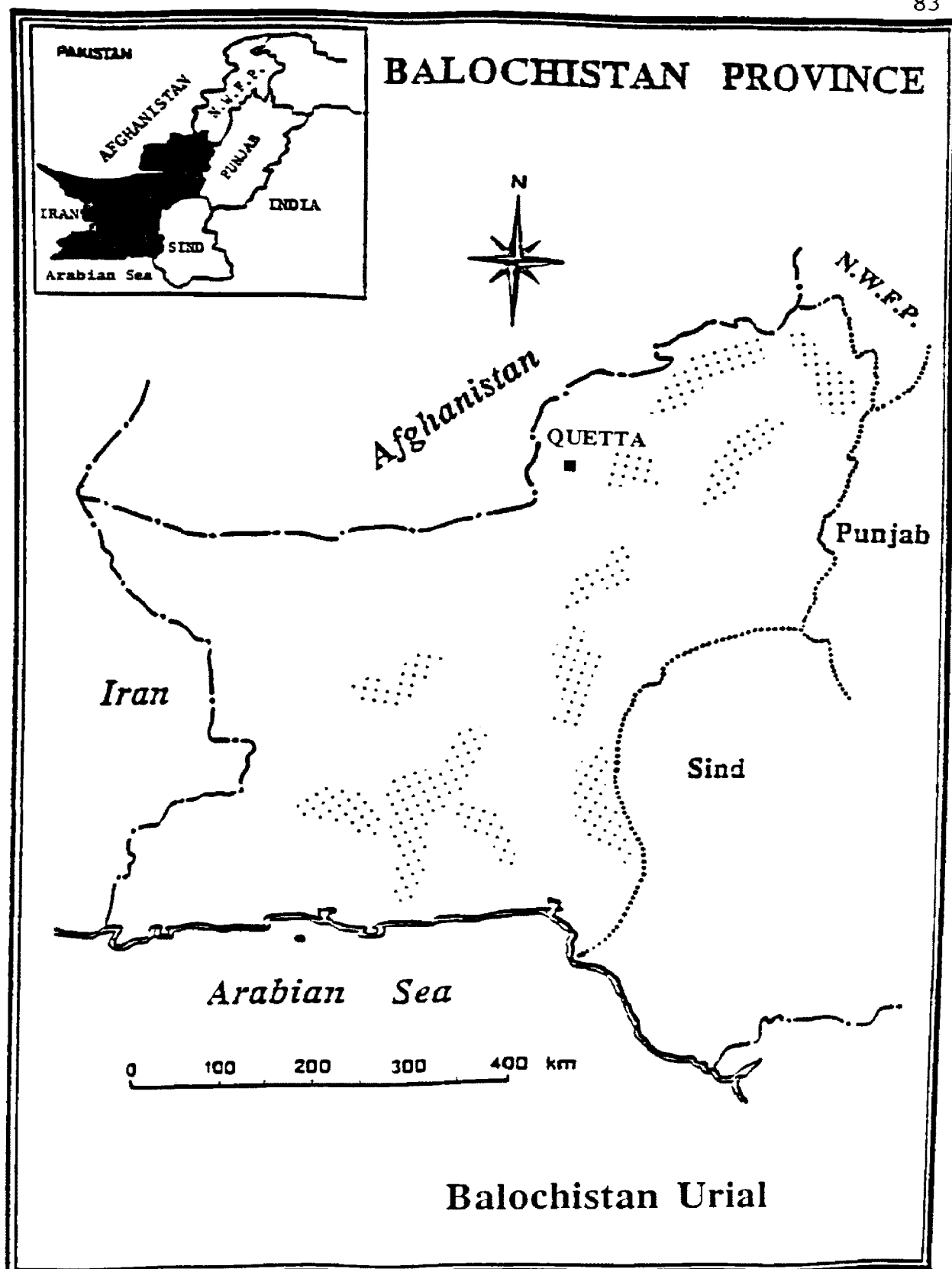


Fig. 9. Distribution of Balochistan urial in Balochistan.

animals. The present population in the Takatu hills near Quetta may be 150 animals (A. A. Khan, Pres. Commun.). The situation in Dureji hills, where a local tribal chief has control, may be little better. This can also be judged from the fact that about 15 trophies of over-mature rams have been taken by foreign hunters from the Dureji area since 1986. There is no information about the status of urial in other mountain ranges. However, all the remnant populations in those mountains are threatened by poaching and habitat loss.

**Existing management:** The urial is a protected species under the Balochistan Wildlife Protection Act, 1974. Its hunting, killing, and possession is prohibited. However, a few exemptions have been made in the recent past. Since 1986, at least 25 trophy hunting permits have been issued by the Provincial Government to foreign trophy hunters, and about 400,000 rupees (\$ 17,000) were charged, mostly to encourage tribal people for their conservation efforts. The trophy hunting program was exclusively arranged by the tribal notables of Dureji and Torghar areas to generate funds for their conservation projects.

A number of areas have been set aside as national parks, wildlife sanctuaries, and game reserves where urials are receiving some protection. Dureji is the only wildlife sanctuary where it has some relief from poaching and livestock competition. Recent establishment of Hingol and

Dhrun national parks might protect this species from indiscriminate hunting pressure from outsiders. These are the areas where urial have the least livestock competition and human disturbance due to remoteness of the areas. Unfortunately, other wildlife sanctuaries and game reserves are either under-staffed or have no management at all. Some of these protected areas are constantly under stress from poaching and livestock grazing. As a result, most of the populations have been wiped out. Apart from general protection, no other specific management program has been launched for the conservation of Balochistan urial in the Province.

**Management objectives:**

The following management objectives are proposed to restore the urial populations to their entire range of distribution in Balochistan.

1. Survey for current distribution and population status of urial in all protected areas and potential habitats of unprotected areas.
2. Improve the protection of already existing wildlife sanctuaries and game reserves.
3. Regulate trophy hunting programs by making provision for them in the Provincial Wildlife Act.
4. Provide economic incentives to tribal people through management and utilization programs.
5. Study ecology of urial to determine the management



requirements of this species.

**Management recommendation:**

1. Little is known about the current distribution and population status of the urial in Balochistan. It is recommended that the Forest Department prepare a project for surveys with collaboration of ZSD and PFI to determine the distribution and status of urial in Balochistan. The first phase should include only known potential habitats such as the Dureji area, Hingol and Dhrun national parks, and Takatu hills. In the second phase, the remaining protected and unprotected areas should be surveyed. The mountain ranges in southern Balochistan are unapproachable by road. Detailed surveys in localities where small populations of urial now survive might take months or even years to carry out. Therefore, each survey phase should be for at least 3 years. However, the best option would be to arrange aerial surveys either by fixed-wing aircraft or by helicopter. Such surveys could be arranged by renting fixed-wing aircraft from the Plant Protection Department or a private plane from someone in Karachi.
2. There are already enough protected areas in the urial's distribution range, but none provide real protection. All these areas need improved protection and management. This should be accomplished by increasing the administrative staff and providing them necessary means of transport and field equipment. Efforts should be made to seek cooperation

of indigenous people in protection and management by providing them with social benefits discussed in the next chapter.

3. The Balochistan urial is popular among international trophy hunters. They are eager to get trophy permits for this species and willing to pay a handsome amount in hard currency. A mechanism of management and utilization of this species should be introduced with the cooperation of local tribal chiefs. However, any trophy hunting program should be based on careful evaluation of population status in each area and should be strictly controlled. A portion of the funds generated through a trophy hunting program should be spent for protection and improvement of the urial's habitat. The rest of the funds should be used for the benefit of local tribal communities.

4. Some notes on ecology and biology of the Balochistan urial can be found in Roberts (1977), Schaller (1977), and Edge and Olson-Edge (1987). However, none of these studies focused on Balochistan, where topographic characteristics and conservation problems are totally different than in other parts of the country. To assess the management requirement of the species, a study on the ecology of Balochistan urial should be carried out in at least 1 or 2 locations (such as Hingol and Takatu). Such studies may be undertaken with the technical and financial assistance of international agencies such as IUCN, WWF International, WWF

U.S., or WWF Pakistan.

5. The urial was found on the lower slopes of the Chiltan Range in the recent past (until early 1970s). It was exterminated from the area due to excessive poaching and habitat loss. Now, with the establishment of Hazarganji-Chiltan National Park, the vegetative cover on the lower slopes has been restored, providing excellent habitat for urial. A project should be developed for the reintroduction of urial in Hazarganji-Chiltan National Park by transplanting a few animals from Lasbella district. Such a reintroduction may help to re-establish urial populations in the Park area, and will increase the aesthetic values of the National Park.

**Goitered Gazelle (Gazella subgutturosa)**

**Family : Bovidae**

**Subfamily : Antilopinae**

**Salient features:** Like other species of Gazella, goitered gazelles are slender-limbed small animals, adapted to survive in arid conditions. In size and body color, they are most similar to chinkara gazelle (G. bennetti). An adult male stands 61 cm at the shoulder and has a body length of 101 cm. A mature male may weigh up to 23 kg. The ears are 14 cm long, and the tail is about 12 cm in length and covered with black hair. The animal has a dark chestnut nose patch

(Roberts 1977). The winter coat is reddish-gray and underparts are white with long silky hair. In summer, the hair is shorter and upper body color is often reddish-brown. The males have cylindrical black horns with prominent rings in the proximal region, and the distal regions are smooth (Roberts 1977). The horn length varies from 20 to 30 cm. Females are smaller in size and lack horns. The most prominent character that differentiates this gazelle from other species of gazelles is presence of a goiter-like swelling around the larynx in both sexes (Ellerman and Morrison-Scott 1951, Roberts 1977).

The rut occurs from the second week of December to first week of January, and young are born from late April to the first week of June. The gestration period appears to be 5 - 5.5 months. Usually a single fawn is born but twins have been recorded (Roberts 1977).

**Distribution:** Goitered gazelles have a very wide distribution. They occur in Israel, Arabian countries, northeastern USSR, western China, Mongolia, southern Afghanistan, and Pakistan (Groombridge 1988). In Pakistan, they are confined to the northwest border region of Balochistan, which includes the desert areas around Nou-Kundi and Nushki in Chaghai District and the plain around Chaman and Gulistan in Pishin District. In these areas, they overlap in distribution with chinkara gazelle (*G. bennetti*). Fig. 10 shows the distribution of goitered gazelles in

Balochistan. In Chaghai District, they usually prefer sand dunes, gravel plains, or mud flats near Dalbandin. These areas almost lack vegetative cover or water. The only cover available are gullies or ravines. They usually avoid steep rocky areas and cultivated fields (Roberts 1977).

**Status:** The goitered gazelles are heavily hunted and often captured alive by local people. Populations appear to have been much reduced ( Roberts 1977). Frequent poaching, export of live-trapped animals, and habitat destruction through use of heavy vehicles by Arab falconers have greatly reduced the numbers of goitered gazelles in Balochistan (Mian 1986). Furthermore, presence of large numbers of Afghan refugees in Chaghai District resulted in habitat encroachment and large-scale removal of bushes. Thus, almost all the remaining populations have been wiped out in that area. Unfortunately, no survey has been conducted; therefore, the present status of this species is not known. However, a few animals may have survived in very remote pockets of the Chaghai District. Presently, this species may be on the verge of extinction in Balochistan.

**Existing Management:** Like other wild ungulate species, goitered gazelles are protected animals and placed in the third schedule of Balochistan Wildlife Protection Act, 1974. Their killing, capturing, and possession is prohibited, but these laws have never been enforced due to political instability along the Afghan border. Since 1981, the Gut

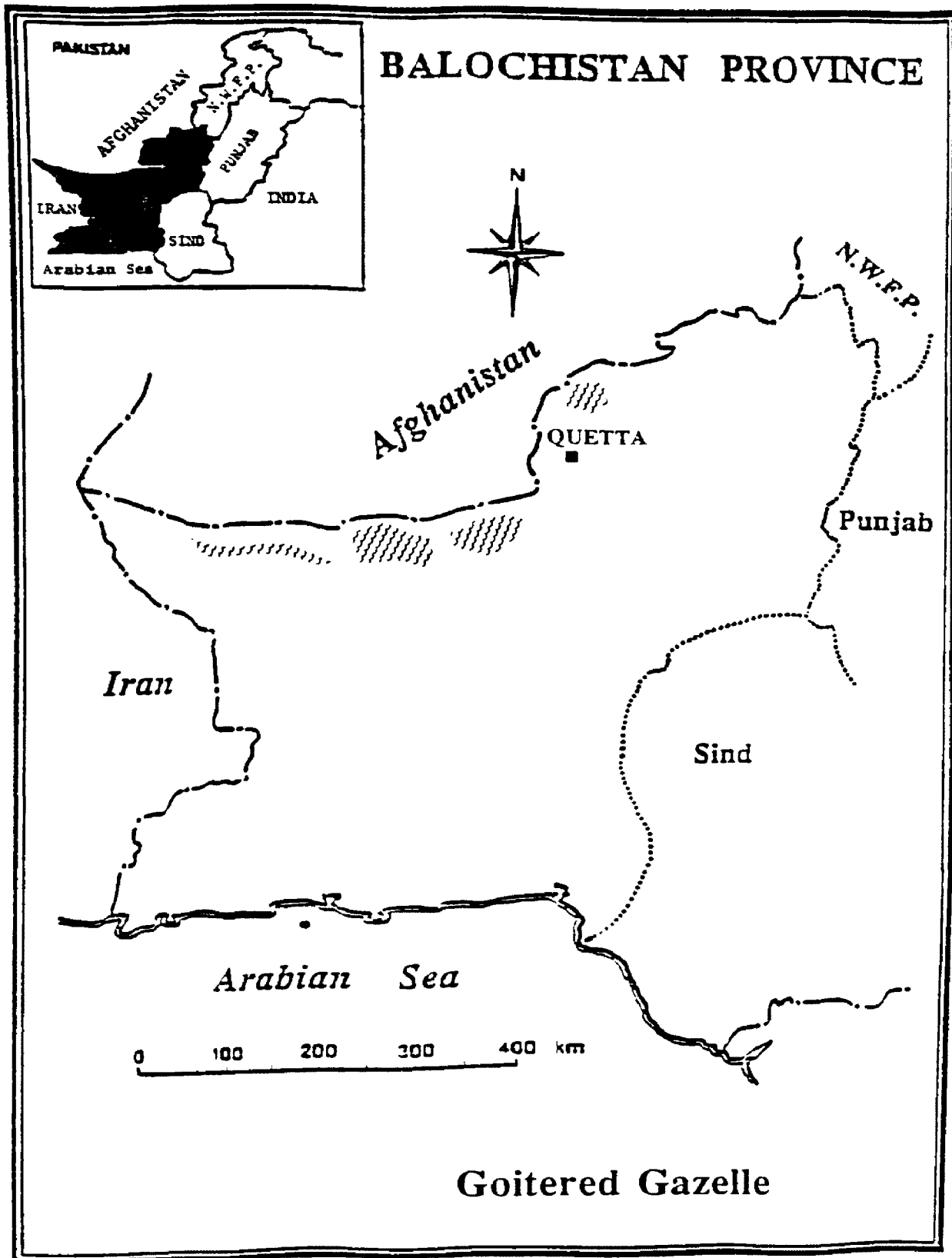


Fig. 10. Distribution of goitered gazelle in Balochistan.

area of the Chaghai District has been declared a wildlife sanctuary, and two Game Watchers have been appointed, primarily for the protection of this species. Like other wildlife sanctuaries of the Province, this sanctuary lacks supervisory staff. Two Game Watchers are insufficient to watch the 165,992 ha area. No other management steps have been taken for the conservation of goitered gazelles in Balochistan. Because of the Federal Government's policy of inviting Arab hunting parties, the Chaghai District, including Gut Wildlife Sanctuary, has regularly been allocated for falconry for the last 10 years. The Arab falconers never observe the local wildlife laws and regulations, which results in over-exploitation of wildlife resources of the area. This situation makes it difficult to start any goitered gazelle management project in the area.

**Management objectives:**

1. Save goitered gazelle from extinction in Balochistan.
2. Carry out annual population surveys of the gazelle to monitor distribution and status of the species.
3. Stop all hunting and live-trapping of the animal in Chaghai District.
4. Manage Gut Wildlife Sanctuary to provide refuge to the remaining animals of this species.
5. Negotiate with the Afghan and Iranian governments to start a joint conservation project along the borders, where goitered gazelles migrate back and forth across

the international boundaries.

6. Seek cooperation of the local tribes for the protection of this species.

**Management recommendations:**

1. Due to political instability along the Afghanistan and Iran borders, detailed survey work in Chaghai and Pishin districts may not be feasible. However, local staff of the Forest Department can gather enough information with the help of local tribal chiefs of the area. They should be deputed to collect information on the present status of this species in the area. The existing staff of the area does not have any experience with the survey of wild ungulates and general characteristics of the gazelle species. Thus, before deputing wildlife staff for such a survey task, some training in survey and identification of gazelles would be required.

2. The protective staff of Gut Wildlife Sanctuary should be increased, and efforts should be made to preserve the existing population of goitered gazelles by improving its protection against poaching and habitat destruction. The cooperation of local inhabitants should be sought for the protection of this species.

3. Every year during hunting season, Chaghai District, including Gut Wildlife Sanctuary, is allocated to the members of the Saudi royal family for falconry. They come to the area with their unlimited resources and do not hesitate



to hunt gazelles whenever they encounter this animal during their hunting trip. Apart from direct killing, they buy live animals for export back to their country and offer large sums of money to the local people. These acts are a direct assault on the gazelle population in Chaghai District. On the other hand, these Arab dignitaries do not spend anything for the conservation and propagation of this species. Therefore, it is recommended that all hunting by Arab parties should cease in Chaghai District for at least the next 5 years, and activities of their local representatives should be monitored carefully. Such a ban on hunting might help to bring back goitered gazelle populations in Balochistan.

4. Goitered gazelles have contiguous distribution in the adjacent areas of Iran and Afghanistan. They might have a migration pattern across the international boundaries. Concerned ministries in Afghanistan and Iran should be approached to know the current status of this species on their sides, and measures should be taken for its conservation. If possible, a joint project should be proposed for the protection and management of goitered gazelles along the borders.

5. Goitered gazelles can be bred successfully in captivity. A project should be prepared for establishing a captive population for reintroduction to Maslakh Wildlife Sanctuary. The reintroduction and regular monitoring might

help to establish a breeding population in the area. But such a reintroduction program can only be successful if local inhabitants of the Maslakh area are actively involved in the project.

**Chinkara or Ravine Deer (Gazella bennetti)**

**Family : Bovidae**

**Subfamily : Antilopinae**

**Taxonomic position:** The systematic position of the chinkara is uncertain. Ellerman and Morrison-Scott (1951) followed by Roberts (1977) and Prater (1980) regarded chinkara as a sub-species G. gazella bennetti. Corbet (1978) placed it with G. dorcas. More recently, based on karyotypic research, Furley et al. (1988) have argued that chinkara should not be described as a sub-species of G. gazella or G. dorcas but should be treated as a full species (G. bennetti) in its own lineage. In this plan, I have followed the latest taxonomic definition of chinkara gazelle.

**Salient features:** The chinkara is a small, delicately built and graceful antelope measuring about 65 cm at the shoulder and weighing about 23 kg (Prater 1980). The body length is similar to that described for goitered gazelles but the goiter-like swelling around the larynx is absent. The general body color is light chestnut with white underparts. White streaks down each side of the face are very prominent.

The stripe along the flank is brown, narrow on the shoulder but increasing in width as it reaches lower parts of the rump (Furley et al. 1988). The male has conspicuously ringed black horns; the horn is slightly S-shaped, but it looks straight from the front. The horn length in males varies from 25 to 30 cm. Females are smaller and develop small smooth horns that curve backwards.

The rut occurs in 2 seasons, 1 from early September to early October and the other from late March to late April. The gestation period is about 5.5 months (Prater 1980). Usually, a single fawn is produced, but twins have been recorded (Roberts 1977).

**Distribution:** Chinkaras are found in Iran, southern Afghanistan, India, and Pakistan (Groombridge 1988). In Pakistan, they have a broad distribution. They are present in all four provinces, but are severely reduced in numbers due to large-scale poaching and habitat loss.

In Balochistan, they occupy almost all plain and desert regions. In the northeast, they are found on the plains around Qila Saifullah and Muslim Bagh (particularly in Patao valley toward Zhob). In the southwest Mekran region, they are found along the Mekran coast up to Lasbela District. Dureji and Hingol areas of the Lasbela District formerly had good numbers (Roberts 1977). During the 1960s and early 1970s, chinkara gazelles were found in abundance in both Chaghai and Kharan districts, but now they are only met as

scattered small populations in very remote pockets of those districts. The plains of Sibi, Kuchhi, and Tambu districts used to have quite a few, but in the recent past these plains have been used extensively for poaching, livestock grazing, and agricultural development. Fig. 11 shows the distribution of chinkara in Balochistan.

**Status:** Until recently, this species was abundant, but its numbers have declined at an alarming rate during the last 2 decades, mostly due to heavy poaching and habitat loss. Now chinkara are only found as small sub-populations in the remote corners of some desert areas. These scattered individuals are being pursued using modern means of transport and spot lights. This type of poaching is done by wealthy people, high ranking civil officers, and local inhabitants for sale to Arab hunting parties.

In the absence of a population survey, it is difficult to make conclusions regarding the present status of this species, but reliable accounts suggest that a few animals still survive in isolated areas of Kharan, Chaghai, Lasbela, and Turbat districts. Mian (1986) reported that during the 1983-84 hunting season about 60 chinkara were sold in Dalbandin town of Chaghai District to an Arab hunting party, and the same number of animals were captured but could not be sold for various reasons. He estimated that approximately 200 were taken out of the wild from the Chaghai areas.

Keeping a chinkara as a pet is also common among

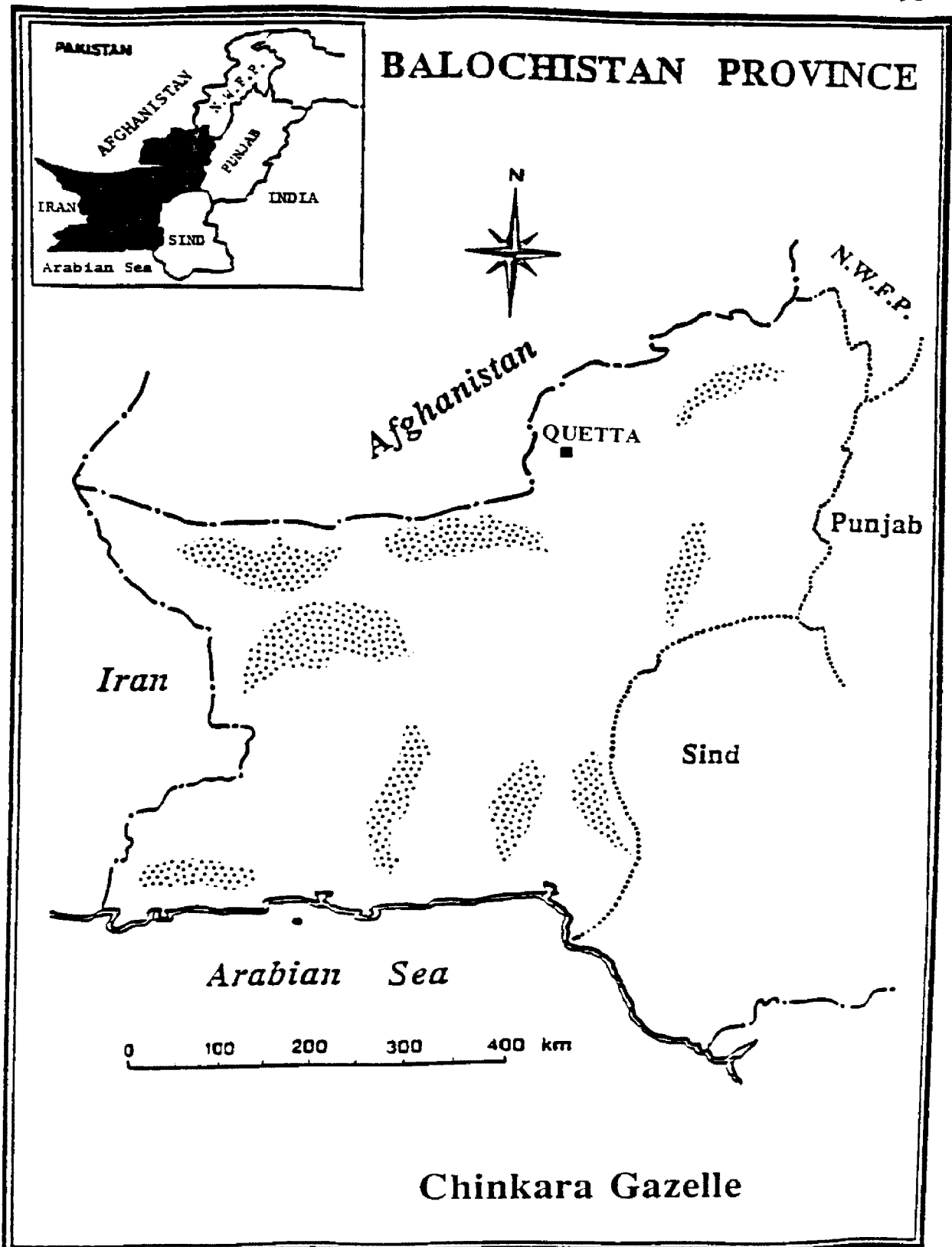


Fig. 11. Distribution of chinkara gazelle in Balochistan.

**Chinkara Gazelle**

wealthy people of the Province. My conservative guess is that about 100 chinkara are in captivity in various homes in Quetta alone.

It is believed that Dureji and Hingol areas of Lasbela District still hold small populations of chinkara (A. A. Khan, pers. commun.). No information is available concerning the status of this species in Mekran, Sibi, and Nasirabad divisions. Probably, a few animals survive in isolated pockets around Jhal Magsi, Gandahwa, Lahri, Bhag of Kachhi District, and Chattar of Tambu District.

**Existing management:** Chinkara was the only wild ungulate that received legal protection under the provisions of the West Pakistan Wildlife Ordinance, 1959 (Govt. of West Pakistan 1968). Later on, it was also declared as a protected species in the Wildlife Act of Balochistan (Govt. of Balochistan 1977). Despite legal protection, this species has never received adequate protection in the wild. The hunting, capturing, and possession of this beautiful gazelle continues unchecked. Except legal protection, no specific management steps have ever been taken for the conservation of this species in Balochistan.

However, chinkara received some protection along with other wild ungulate species in a few protected areas. These areas are Dureji, Rughia Rakhsan, and Maslakh wildlife sanctuaries, but it has been reported that the population in the Maslakh area was almost wiped out by indiscriminate

hunting during the last 2 decades (M. Shafique pers. commun.). However, the Dureji area still has more than a dozen animals (A. A. Khan pers. commun.). It is hoped that the recent designation of Hingol and Dhrun areas as national parks may help to recover the dwindling populations of chinkara in those areas.

**Management objectives:**

1. Conduct surveys to determine the current distribution and status of chinkara in its former ranges in Balochistan.
2. Intensify existing protective measures for the protection of the remaining populations of this species.
3. Regulate possession of chinkara in Balochistan.
4. Strengthen anti-poaching measures in Lasbela and Chaghai districts, where capturing of chinkara is still common.
5. Ban allocation of Lasbela, Chaghai, and Kharan districts to Arab hunting parties and monitor chartered flights and camping sites of these hunting parties to control illegal export of chinkara from Balochistan.

**Management recommendations:**

1. It is difficult to estimate the total population of chinkara in Balochistan because the remaining populations

are scattered over various remote areas in the Province. However, population surveys would be possible in protected areas, particularly in Dureji, Hingol, Dhrun, Rughia Rakhsan, and Gut areas. Such surveys should be carried out without further delay, so that appropriate management steps can be taken.

2. An effort should be made to strengthen existing protective measures against poaching and habitat disturbance. Poaching can be reduced by increasing supervisory staff and by providing them with motorcycles for regular visits to the areas under their jurisdiction. Habitat disturbance can be reduced by limiting livestock grazing and by excluding hunting with heavy motorized vehicles.

3. Keeping chinkara as a pet is popular among wealthy people, high-ranking civil and military officers, and local tribal chiefs. Past experience shows that it is difficult to control illegal possession of the gazelle because possessors are usually influential people. It is recommended that possession of chinkara gazelle should be regulated by making necessary amendments in the Balochistan Wildlife Protection Act. A provision for charging Rs. 1000 per animal as annual possession fee should also be provided in the Act.

4. One of the major threats to this species is from Arab hunting parties. These parties not only kill this animal but also use all kind of tactics for the illegal export of



gazelles from Balochistan for establishing safari parks or keeping them as pets in their own countries. Each hunting party usually carries 100-200 heavy vehicles including gas and water tankers, communication vehicles, and trucks. They often use more than 20 powerful 4WD vehicles for roaming every corner of the deserts and searching every bush for Houbara Bustard (Chlamydotis undulata) and gazelles. The results of this war against the chinkara are devastating. Such ruthless activities have imbalanced the whole desert ecosystem of chinkara habitat in Balochistan, and movement of the heavy vehicles in the area has caused severe damage to the desert vegetation. This situation demands immediate attention of conservation authorities in the Province. It is recommended that allocation of hunting areas of Balochistan to the Arab falconers should cease for at least the next 5 years and the illegal export of chinkara should be controlled. International flights from Gawader and other cities should be monitored regularly.

5. The cooperation of local people should be sought for the protection of chinkara in their native habitats. The involvement of local tribal chiefs in the conservation of this species could be an effective tool against large-scale destruction to chinkara habitats by the Arab hunting parties.

**Wild Boar (Sus scrofa)****Family : Suidae**

**Salient features:** An adult wild boar is a bulky animal with a short thick neck and slender legs. A mature male may stand 84-91 cm high at the shoulder; body length varies from 115-150 cm; and the tail is short, measuring 18-23 cm. The tusks usually measure 23-30 cm on the outside curve. A big male may weigh 100-200 kg, but Prater (1980) reported that weight may exceed 230 kg in some parts of India. The animals have small eyes set far back close to the base of the ears. The ears are large, pointed, and set forward. The skin is dark gray in color, and is sparsely covered with black and brown bristles from the nape down to the rump. Bristles are longer in the nape and shoulder regions, forming a crest. Young boars look brown, but old ones are much grayer. Females are smaller in size and their canine teeth are much less developed.

Wild boars are capable of breeding during all seasons, but the peak breeding season of this animal is from July through October. The gestation period is about 16 weeks (Roberts 1977), and females produce their first litter between 1 and 2 years of age (Taber cited in Roberts 1977). Females breed more than once in a year, and usually give birth to 4 - 6 youngs (Prater 1980), but a litter size of 8 piglets has been observed (Roberts 1977).

**Distribution:** In Pakistan, wild boars are typically associated with the Indus Basin's riparian areas having thick growths of Saccharum spp. They usually avoid arid mountainous regions (Roberts 1977). In Balochistan, they have a very limited distribution, because more than 80 % of the land in the Province is arid and semi-arid mountains. However, a dense population is present in Nasirabad Division, where they are confined to the irrigated agricultural fields around Kirthar and Pat Feeder canals. In Sibi and Kachhi districts, they are found along the riparian areas of the Nari River.

At the turn of this century, presence of wild boars in the Mashkae River valley, along the Hingol River, in the forests around Liari and Uthal (Lasbela District), and along the Zhob River was recorded (Government of Balochistan 1986), but there is no current information about the occurrence of this species in these areas. However, a few animals may be met near Shadi Kaur (near Turbat) and along the Hub River (Lasbela District) (Hamid Ali, pers. commun.). Fig. 12 shows the distribution of wild boar in Balochistan.

**Status:** No population survey has ever been conducted for wild boar in Balochistan. The wild boar, however, is not as serious a problem in Balochistan as it is in the provinces of Punjab and Sind, where this animal is a serious pest to agricultural crops. During 1985-86, in Faisalabad District of Punjab, the estimated losses of agricultural crops to

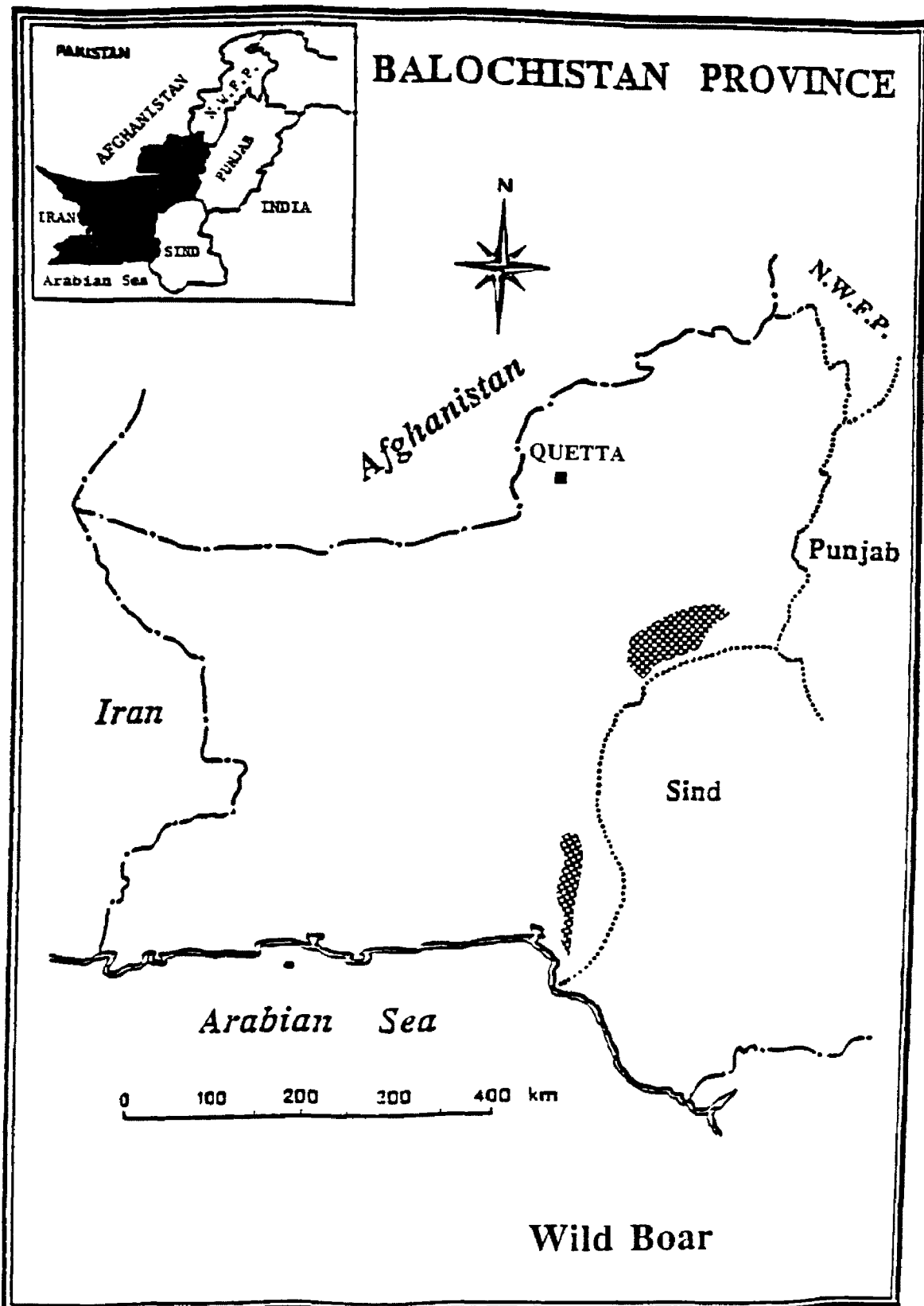


Fig. 12. Distribution of wild boars in Balochistan.

wild boars were 130.9 million Pakistani Rupees (US \$ 7.6 million) (Brooks et al. 1989).

Jafarabad and Tambu districts may have the largest population of this species due to availability of good hiding cover along the Kirthar and Pat Feeder canals and their sub-canals, mostly in the form of Typha, Phragmites, and Saccharum species. Agricultural crops like wheat, rice, barley, and millet (Jovar) also provide a temporary refuge for hiding and breeding. Some damage by wild boar to the rice and wheat crops has been reported in Jaffarabad and Tambu districts. In 1988 during a waterfowl census, I saw a herd of 15 animals in the marsh area of Baroon Kirthar canal. I believe population densities were high in those areas. There is no information about the status of this species in other areas of Balochistan. However, there is need for a population survey of this species in the Province.

**Existing management:** Islam prohibits raising, eating, and other consumptive uses of boars. Being an Islamic Country with strong religious beliefs, all the muslims in Pakistan are reluctant to see a pig, whether in captivity or in the wild, alive or dead, and usually refer to it by an indirect name. Thus, there is no question of consumptive use of this species. Therefore, in the absence of a natural predator, wild boars in Pakistan have increased their densities to full carrying capacities in many areas of the country. They

are a serious pest to agricultural crops and forest plantations, particularly in Punjab Province. As a result, the Punjab government has launched a scheme for eradication of wild boar, but that project has had little success. Presently, research is under way to determine ways and means for keeping this species at lower densities. However, no such problem exists in Balochistan, because topographic characteristics of the province do not provide suitable habitats for this species, except in a few areas of Nasirabad Division. This species is not listed in the Balochistan Wildlife Protection Act, 1974, meaning it is open to everyone for killing, capturing, and harassing.

**Management objectives:**

The following management objectives are proposed for the wild boar in Balochistan:

1. Find the best and most suitable way for maintaining wild boar populations at a very low level without jeopardizing the existence of the species, so that it does not become a pest to agricultural crops.
2. Avoid methods of wild boar population control that are harmful to non-target species and create environmental hazards.
3. Convince people that the presence of wild boar as a species is essential for the ecosystem and its complete removal may affect the life of other creatures.

**Management recommendations:**

1. The wild boars in Pakistan have enjoyed ecological benefits due to the religious beliefs of Pakistanis and the absence of natural predators. In addition to some ecological benefits, they also have the biological advantage of a high fecundity rate. They breed during all seasons, their gestation period is short (4 months), and litter size is high (4-6 piglets). All these biological advantages make them capable of recovering from any limited control or other natural disasters (such as high floods). Therefore, any wild boar management and population control program should be based on detailed studies of the biology and behavior of this species.

2. The Vertebrate Pest Control Center of Pakistan should use all its available resources for determining a suitable way for keeping wild boar populations at a low level without harming the existence of the species. The fecundity rate of this species is very high, thus, use of an effective chemo-sterilant in baits may be feasible to keep this species at lower densities (Pavlov 1980).

3. The N.C.C.W. of Pakistan should explore possibilities for wild boar safari hunting by foreigners and cooperation of Pakistan Tourism Development Cooperation should be sought for such a safari hunting program. A permit fee of US \$ 300 for a week-long hunting trip could be charged to hunters. Of course, Muslims can not use the money earned from such a

hunting program. That money can be used for providing social benefits to the non-muslims of the area where animals were shot. This may encourage local non-muslims to participate more actively in the safari hunting program.

4. Overseas markets are available in non-muslim countries for the sale of wild boar meat, hides, and bristles. Any export project based on commercial utilization of wild boar through a foreign firm and non-muslim labor may be an option for population control in areas where populations of this species have exploded. Funds generated through such a project can be spent for the welfare of non-muslim minorities. However, before initiating a commercial utilization project, the consent of the Islamic Ideology Council of Pakistan should be obtained about the validity of commercial utilization of wild boar for the social welfare of non-muslim minorities in the country.

5. Taking into account the past experiences in Punjab, it is recommended that the Balochistan Forest Department should avoid large-scale irrigated block plantations in Nasirabad Division. This will reduce the chances of creating new habitats for wild boars and increasing their impact on the farmlands of the area.

6. Hunting of wild boar in Balochistan should continue without any permit requirement, and there should be no restriction on sex, age, number, or place of hunting of wild boar in the Province. However, special permission would be



required for entering protected areas.

7. The Wildlife Wing of the Forestry Department should make a population assessment of wild boar in Nasirabad Division and identify their impacts on the croplands of Jaffarabad and Tambu districts. The cooperation of the Balochistan Agriculture Department should be sought for launching such a study.

## Chapter IV

### **ROLE AND DEGREE OF POSSIBLE PARTICIPATION OF TRIBAL PEOPLE IN CONSERVATION**

#### **A Brief Review of Local People Participation Concept**

Perhaps the world is on the verge of a major shift in conservation philosophy. In the past, most developing countries were trapped in the colonial method of wildlife protection-- policing wildlife areas and separating local people from their natural environment. Now we may see people truly as a part of wildlands, and even as custodians of natural resources.

The world conservation strategy developed in 1980 emphasized the importance of conservation to human survival rather than total preservation of biological resources. The document also drew our attention to the value of conservation at the local level by stressing the importance of traditional knowledge (IUCN 1980). Local people managed their surrounding environments for centuries, but their communities have been unbalanced by the invasion of outsiders. Conservation projects launched by outsiders rarely contributed to the development of the local people,

and more often were detrimental to their interests (Eltringham 1984). It has been realized that conservation has not yet followed the right path because the problems are not biological, but rather political, economic, social, and even ethical.

New conservation approaches are needed to address socio-economic and political factors in developing community-oriented projects. People living in and around habitats often hold real power over the use of biological resources. These are the people who make local decisions and their decisions are affected by a variety of socio-political factors, including their own self-interest. There is a need to identify the interests of local people, and design ways of ensuring that the interests of conservation and local communities are reconciled (McNeely et al. 1990).

At present, self-interest is often defined in terms of economics. Thus, conservation needs to be promoted through economic incentives. Such incentives may be direct, in the form of cash, or indirect, as social benefits for the community (McNeely 1988). A new global conservation strategy is being prepared. A review of the second draft indicates that it will emphasize economic and social, as well as ecological, requirements for sustainable management of biological resources (IUCN 1990).

The concept of wildlife management as a viable alternative land use in marginal areas has recently been

introduced in the main-stream of economic development in rural areas of some African countries. This concept contains elements of both management and use of wildlife for the benefit of local people. Policy makers and conservationists have started to recognize the legitimate rights of local people to use natural resources, and that wildlife management schemes must have the cooperation and support of local communities to achieve success in the long run. Conservation projects must respond to perceptions, interests, and needs of local communities, and must create positive economic incentives (Kiss 1990). The success of any conservation project usually depends on the degree of support provided by local communities. Their support can only be achieved by the active participation of local communities at all levels of project activities, including planning and design, implementation, management, and benefits. This strategy for conservation of wildlife and management of protected areas has been demonstrated successfully in many countries and for specific conservation projects including: Belize (Horwich 1990); Madagascar (O'Conner 1990); Wildlife Industries New Development for All (WINDFALL) and Communal Area Management for Indigenous Resources (CAMPFIRE), Zimbabwe (Muridagomo 1990); Annapurna Conservation Area, Nepal (Bunting et al. 1991); and even in Pakistan (Kermani and Khan 1985).

**Generation of Funds for Conservation Projects:** To bring

benefits to local communities and to make conservation programs self-supporting, the most reasonable option would be sustainable utilization of potential resources as an economic asset. Wildlife utilization could be a source of funds for conservation and other community benefits, but typically these resources are ignored (Eltringham 1984). Many of these resources have already been depleted, but enough is left to build their numbers to levels at which wildlife could make a significant contribution to human welfare.

Wildlife uses differ with respect to their economic potential and with regard to the local situation. However, the most lucrative wildlife uses at present are trophy hunting and tourism. Where tourism is not popular, trophy hunting is often regarded as offering the highest economic potential. An animal sold as a trophy can be worth many times what the same animal is worth for meat or for other purposes, and, presumably, trophy hunting has little ecological impact on wild populations (Kiss 1990).

Carefully controlled trophy hunting in some African countries has brought in considerable money. Some monies have been retained in revolving funds to finance conservation projects, other funds have been used to improve the welfare of local people through community-oriented projects. The commercial and safari hunting programs in Zimbabwe (Child 1984, Cumming 1989, Murindagomo 1990) and

Zambia (Lungu 1990) have successfully operated similar projects for the benefit of local people. Another successful conservation and utilization program through safari hunting has been operated in the Mongolian People's Republic (Des Clers 1985). Besides raising funds, trophy hunting is advantageous because the presence of a legal hunting system can deter illegal hunting activities (Kiss 1990). Strictly controlled trophy hunting does not harm populations of wild animals (Child 1984). However, the danger of over-exploitation is always present, because most trophy animals carry very high price tags, and self-interest can contribute to over-exploitation. Therefore, any trophy hunting-based conservation program should be run with caution and with careful evaluation of the whole process.

**Benefits to the local community:** Local communities can benefit from the management of wildlife through revenue from sustainable utilization and preservation of traditional, cultural, and religious practices and sites. Local employment and community welfare services (such as health care, schools, improved roads, clean water supplies, and financial grants for subsistence agriculture practices) are common benefits often gained through wildlife conservation and utilization projects. Goodland (1985) suggested that certain basic needs of tribal people must be acknowledged and accommodated if these communities are to benefit from, rather than being harmed by, conservation projects.

The operational and financial systems of conservation projects (with local people participation) vary among programs. However, where revolving funds are generated through wildlife uses, certain mechanisms have been adopted for distribution of revenues among government agencies, local communities, and wildlife management programs. For example, in Zambia, under a Game Management Areas project, 35 % of the revenues generated go to community projects, 40 % to wildlife management programs, 15 % to the National Parks Management Department, and 10 % to Zambia's National Tourist Bureau. In the Luangwa Integrated Rural Development project, 40 % goes to community projects selected by a local leaders' committee and 60 % to defray project management costs (Lungu 1990). Another example of conservation fund distribution is the Annapurna Conservation Area in Nepal, where 50 % goes to the Panchayat (self-governing district) development fund, 25 % is a bonus to Forest Guards, and 25 % is divided between members of Panchayat's Nature Conservation Committee (Bunting et al. 1991).

**Problems with the local participatory approach:** The best results from local people's participation in wildlife conservation activities are based on "bottom up" projects. This means that local communities themselves identify their needs and try to manage their wildlife resources on their native lands. Such self-help projects can increase local confidence and competence in handling their own affairs and

may generate commitment and a capacity for overcoming local problems.

A serious dilemma in participatory approaches is how to achieve an equitable distribution of project benefits among all community members. Marks (1991) mentioned that, in the absence of local institutions, the benefits from wildlife utilization may go to those who are already influential and powerful in the community, while others derive little or no benefits. This situation may create conflicts among community members. An example of such conflict was reported in Kirthar National Park, Sind, Pakistan (Rao 1989b). There, clashes between 2 tribes resulted in the massacre of a large number of Sind ibex and urial. This was probably because of inequality in distribution of benefits derived from the Park, or because Park authorities ignored a local tribe in the participatory management approach. The tendency of local tribal chiefs to capture a program's benefits for personal gain must be recognized, mitigated, and guarded against.

#### **Scope of Participation by Tribal Communities in Wildlife Conservation Efforts in Balochistan**

**Social and cultural setting:** The community organization in Balochistan comprises various Baloch and Pushtun tribes, which extend across the borders into Afghanistan and Iran. These tribes largely depend on a subsistence way of life.



There are 3 major tribal groups: Baloch, Pushtun, and Brahui. Each of these tribes is further divided into different sub-tribes and further into lineage sub-divisions. The structure of these tribes is based on kinship relations, which are bounded by social, economic, and political relationships. Although these tribes speak different languages, their beliefs and customs are quite similar. Hospitality, courage, simple life, and honesty are common traditions and values of tribal people. Islam plays an important role in specifying rights, behavior, and other family-related issues.

Most of the Baloch and Pushtun tribes are still nomadic or semi-nomadic herders of sheep and goats in the mountains. Pastoralists, either Baloch or Pushtun, are poor and the least likely to be affected by outside forces. Agriculturists normally live in valleys and usually have connections with cities and towns. People in agricultural and orchard growing areas tend to be more prosperous than people living in the mountains. Social organization in these areas is little different from the tribal structure outlined above. Life is more individual, with less unity and solidarity among village people than among pastoralists. Tribal influences in the valleys are steadily weakening with the expansion of educational and employment opportunities in urban areas and in other countries (Buzdar and Jameson 1984).

Most of the mountainous areas have well established tribal systems. Though their traditional organization has suffered from outside influences, they still retain most of the traditional political, economic, and social systems. Family organization, the role of religious leaders, the role of sub-tribal leaders, and other traditional practices remain intact. Most of the tribal chiefs still hold some power over their people and tribal areas. However, with growing economic, political, and social opportunities in the cities, most of these tribal chiefs no longer live in their own tribal areas. The heads of sub-tribes (Maliks, Wa Takaris, and elderly leaders) now hold the leadership in tribal areas. These people have immediate power over natural resource use. They have little education or knowledge of the outside world.

People of tribal groups are well aware of their economic deprivation. They are hardly making subsistence living on very marginal lands. Tribal rights to land and water use may be important, but how many people actually care for their native lands is questionable. Little value is thus attached to sustainable use of natural resources. The attitude of the tribal community toward wildlife is somewhat vague. They believe that wildlife has no economic value for them because it is the property of government. Therefore, protecting and managing wildlife resources is the concern of government.

**Objectives of local participatory approach:** Conservation and management of wildlife through community-oriented projects should be based on the following objectives to ensure long-term wildlife conservation success in Balochistan.

1. Promote preservation of habitats or particular threatened or endangered species.
2. Discourage poaching and habitat destruction by making provisions for public participation, controlled wildlife utilization, and other subsistence land-use practices within the provincial Wildlife Protection Act, 1974.
3. Promote interest of tribal communities in wildlife conservation by providing them various benefits.
4. Involve tribal chiefs in conservation efforts by giving them appropriate economic incentives from sustainable use of wildlife.
5. Take advantage of lucrative and growing international tourism and trophy hunting markets.
6. Develop self-help conservation programs as a means of achieving long-term self-sufficiency through sustainable use.

### **Scope of Local People Participation**

Preserving and policing efforts have not been successful in saving dwindling wildlife resources in

Balochistan. Several species of wild ungulates are already on the verge of extinction, while others are threatened, vulnerable, or rare. Habitat destruction caused by fire-wood removal and livestock over-grazing are widespread problems. Poaching of wild animals is common. Despite sincere efforts, government agencies have been unsuccessful in protecting wildlife resources, primarily due to the shortage of technical staff, lack of funding, and failure to involve local people in wildlife conservation efforts. Hence, the future of wildlife is uncertain.

Most of the tribal people are unaware of the importance of wildlife resources. They believe there is no economic use for wildlife except its traditional uses as meat or for sport hunting . Most people remain unaware of the ecological importance or possibility for sustained use of wildlife.

Tribal people, however, are aware of the general degradation occurring on their lands, but they are reluctant to blame themselves for the degradation. They believe the government and natural environmental changes are responsible for the problems.

Nevertheless, the potential for greater participation by local communities in conservation efforts remains. At present, tribal chiefs and leaders of sub-tribes are willing to cooperate in conserving wildlife in their respective areas, particularly if some benefits accrue to themselves or their people. Some landowners are even interested in

donating their lands to the government for management. This is the case in the Koh-e-Suleiman area of Zhob District (Khan 1989). In another case, some people from Kalat District approached the Forest Department in 1988 about donating their tribal lands to the government for conservation and management of wildlife in exchange for employment opportunities for tribesmen as Game Watchers.

The literacy rate in tribal areas is very low, there is no industry, no extensive agriculture, and no employment opportunities. People are without basic community services. Thus, they need money and seek to fulfill immediate demands rather than thinking about future generations. This attitude has exerted great pressure on natural resources.

Wild ungulates, particularly markhor, wild goat, and Balochistan urial, have tremendous economic and commercial value, especially through controlled trophy hunting by foreign hunters. These hunters are willing to pay large sums of hard currency for a hunting permit. For example, each mature markhor can earn 0.2 - 0.3 million rupees (U.S. \$ 10,000 to 15,000) in the form of foreign exchange. Thus, harvesting only a few animals annually can help solve many social problems in the tribal communities.

It is essential that trophy hunting programs should be based on regular census of the ungulate populations, monitoring their distribution, and assessing the condition of the remaining habitat. Without proper mechanisms for

sustainable use, the province might lose the remaining populations. Therefore, prior to launching any wildlife conservation program, there is need for careful evaluation of current populations, negotiations, concessions, developing terms and conditions, and defining clear objectives for each program.

Kiss (1990) presents a summary of guidelines for the design and implementation of community-oriented projects that can help identify key informational needs, project components, and steps in implementation. These guidelines include: (1) defining clear objectives, (2) defining the project area, (3) defining and understanding the target community, (4) determining elements of the project, (5) ensuring participation and commitment by the local community, (6) ensuring government support and commitment, (7) establishing an institutional framework, (8) providing financial and technical support, and (9) provision for mid-term and end of project evaluation.

To evolve a strategy for local participation, considering the existing social and political structure of tribal areas would be essential. Most of the wildlife areas lie in tribal zones where people follow tribal laws that are not applicable to the settled areas of the country. Traditionally, tribal people enjoy all rights to graze and collect fire-wood. Any step toward a community-oriented project would require the recognition of these rights, but

on managed and controlled bases.

**Institutional structure, project implementation and**

**financial aspects:** A kind of primary institutional infrastructure already exists. There is a need to develop legal mechanisms that are supported by government and tribal people. Qutub (1989) suggested that, in a community participatory approach, it is essential that local people establish their own institutions, identify their own priorities, organize their resources, and develop their own agenda for development.

However, government agencies can play a significant, if limited role, in the conservation of wildlife resources. These agencies can help tribal leadership establish "Wildlife Conservation Societies". The establishment of these societies under the leadership of tribal chiefs may be 1 of the best options to start community-oriented projects. Representatives from these societies should be involved in planning, implementing, and managing and should derive benefits from the process. While it is true that the present tribal system does not allow a democratic approach, tribal communities and feudal systems are changing rapidly with the increase in communication links and connections with cities. Full participation of tribal people is impossible without the involvement of Maliks, Wa Takries, and Safed Rish (elderlies). A communal project without involvement of this sub-leadership may not survive over the long-term. It seems

this is the remaining leadership of people living in the mountains and actually controlling the land-use practices. Even tribal sardars of the main tribes are maintaining their link with their tribesmen through these Maliks and Takries. Presence of proper institutions as Wildlife Conservation Societies may provide a great help in management of conservation areas.

After identifying the target area with the technical assistance of the Wildlife Department, the concerned sardar would be responsible for establishing a Wildlife Conservation Society and designating a management committee with the consent of his tribesmen. It would be best if the leadership of each sub-tribe were given a chance to serve on a Management Committee for a certain time period. Such a committee would make management decisions and would select Game Watchers according to the land-use rights of each tribe. Over-all management control of the conservation project should be directed by the concerned tribal chief. However, the Wildlife Department can provide technical assistance in surveys and other management decisions. When wildlife populations increase to levels where annual harvests could be sustained, the government could issue strictly controlled trophy hunting permits to hunters. Moreover, when populations of wild ungulate are adequate to sustain hunting for meat, permits for subsistence hunting by local tribesmen could be issued. The hunting permit should



be based on the recommendations of the Management Committee and Wildlife Wing of the Department. The decision to fix annual harvest quotas should be made by the management committees based on demographic characteristics of the wild ungulate populations and funding needs for local community development.

Once economic benefits started to flow to the local communities, the reduced poaching of wild ungulate may lead to an increase in their population. With such increase a sustainable annual harvest can be allowed to make conservation programs self-supporting. It might also illustrate to the government the magnitude of funds that could be generated through sustained-yield use of wildlife.

The funds generated from trophy hunting could be directed to manage wildlife of an area as well as to provide social services to the community. The method for distribution of such funds can be worked out by negotiation between the concerned tribal chief, Management Committee, and the government. However, the government can charge some percentage of the hunting permit fee in foreign currency. Instead of depositing that foreign exchange in the government treasury, it could be maintained as a special fund. These funds could be used to purchase books, equipment, subscriptions to wildlife journals, and for foreign training for the technical staff-- all of which require foreign currency. This strategy has been

successfully implemented in NWFP, Pakistan (Malik Mumtaz, pers. commun.) and in Annapurna Conservation Area, Nepal (Bunting et al. 1991).

Although the Balochistan Wildlife Protection Act, 1974 has been extended to all provincially administrated tribal areas since 1980, public participation and controlled trophy hunting is missing. Necessary amendments are required to make local participation and wildlife utilization a legal process. Therefore, the active participation of local communities, the interest of tribal chiefs, and a change in government attitude might help save the diminishing wildlife resources of the Province.

#### **CASE STUDY**

##### **Torghar Wildlife Conservation Project**

**History and project description:** The Toba-Kakari range of Zhob Division was well known for its rich wildlife resources, particularly for straight-horned markhor and Balochistan urial (Tareen 1990). These animals were abundant as recently as the middle of this century. In the late 1970s, an influx of cheap and readily available firearms resulted in increased poaching of wild ungulates. As a result, animals were killed indiscriminately. By the early 1980s, populations of markhor and urial were reduced to very low numbers. Soon it was realized by the tribal leaders that

if effective measures were not taken to control the slaughter of big game animals, the area would lose its wildlife resources entirely.

The provincial government was approached by the local tribal chief for help in saving the vanishing wildlife of the area. The government showed its financial limitations by not appointing additional Game Watchers in the area. Meanwhile, in December, 1984 a delegation funded by the U.S. Fish and Wildlife Service, comprised of Drs. Richard Mitchell (FWS), Bart O'Gara, Leader, Montana Cooperative Wildlife Research Unit, and Bruce Bunting of WWF (U.S.) visited Balochistan to discuss wildlife conservation programs in the Province. During the course of their discussions with the officials of the Government, they suggested involving tribal people in wildlife conservation efforts in the tribal areas of Balochistan. This idea was well taken by the officials of the Forest Department. While this was going on, 1 of the tribal Chieftain (Sardar Nasir Tareen) met the delegation in Quetta and he asked for financial support from the U.S. Fish and Wildlife Service for saving endangered wildlife of tribal areas in Zhob Division. Dr. Mitchell told Mr. Tareen that FWS funds could not be used for private conservation projects. He encouraged Mr. Tareen to contact private conservation organizations in the United States. However, he agreed to provide technical assistance for outlining a private conservation project in

the Torghar area. On suggestions from Dr. Mitchell, private organizations in the United States were contacted for financial assistance. In addition, the possibility of developing a trophy hunting program to generate revenue was explored. After receiving positive indications from both sources, the tribal leaders decided to start a private wildlife conservation and utilization project. Finally, with the efforts of the late Nawab Taimur Shah Jogezai and the leadership of local sub-tribes, the Torghar mountains of Toba-Kakari range were selected and a project launched in late 1985. Dr. Mitchell visited the area for preliminary surveys of wild ungulates and provided technical advice for making the Torghar project self-supporting through conservation and sustainable use of wildlife of the area.

Government control over the land was weak, thus law enforcement was poor. Consequently, efforts were made to win the support and confidence of people inhabiting the area. It was explained to tribal communities that the successful operation of the project would bring employment opportunities and other economic benefits.

**Project Objectives:** The over-all objectives of the project were to:

1. save endangered straight-horned markhor from extinction and to increase the shrinking population of Balochistan urial;
2. develop a self-supporting project by sustainable

- harvesting of a few mature animals annually;
3. generate funds for the benefit of tribal communities by offering trophies to foreign hunters; and
  4. demonstrate to tribal people that their active participation in wildlife conservation and management could benefit them.

**Project Management and Institutional Structure:** Torghar conservation project was a privately initiated program by the Nawab's family of Jogezei tribe with the help of others in the tribal leadership. Responsibility for project implementation has been shared with the Jalalzai sub-tribe, who basically own the tribal rights of the area.

In 1985, as part of the deal with Jalalzais, 7 Game Guards were hired, 1 from each lineage group according to their tribal rights and land ownership in the area. These Game Guards were responsible for the protection of wildlife in the area belonging to their lineage. The number of Game Guards was increased over time and by 1990 there were 31 full time Game Guards. Cutting of green trees and removal of bushes from the core habitats of markhor and urial was totally banned. However, Jalalzais and other nomadic tribes of the area were allowed to collect dead fallen wood for household use. Employment as a Game Guard is a regular source of income for Jalalzais and is good compensation for what they lost through reduced livestock grazing and other traditional land-use practices, such as hunting and firewood

removal.

A major break-through in solving initial problems occurred when all lineages of the Jalalzai tribe agreed to respect their commitment to the tribal law of no hunting of wild ungulates, no removal of green trees and bushes, and a steady reduction in domestic sheep and goat populations. Under the tribal law, penalties for poaching of markhor and urial were very serious, including a fine of 10,000 rupees and confiscation of a poacher's gun, or if the poacher was unable to pay the fine then confiscation of his sheep and goats to the amount of the fine.

**Project Funding and Wildlife Utilization:** Initially, the project was funded by a donation of U.S. \$ 10,000 in 1985 from a private organization in the United States. This amount was used to hire Game Guards, and to purchase binoculars, field tents, and warm clothing for the Game Guards. During 1986, Safari Club International contributed an additional U.S. \$ 10,000 to the program. Meanwhile, trophy hunting of a few straight-horned markhor and Balochistan urial was arranged for foreign trophy hunters. It has been reported that organizers of the program charged U.S. \$ 7,500 for each trophy urial. A total of U.S. \$ 60,000 was generated through the hunting season of 1989. These funds were mostly used for hiring Game Guards, guides during hunting season, and for providing social services to the tribal community.

During 1987-88, the organizers of the program realized that the goals of the program could not be achieved without the involvement of the Provincial Government. To operate the trophy hunting program under a legal umbrella, the government was approached to obtain 10 permits for cropping trophy animals in support of the conservation program. Despite the recommendation of the provincial Forest Department, the proposal was rejected for various reasons. Finally, during 1990, the government approved the harvest of 10 urial upon payment of U.S. \$ 1000 per permit as a trophy hunting fee by the foreign hunters to the government treasury. The remaining \$ 6,500 is charged by the organizers to operate Torghar wildlife conservation program. All these permits were issued directly to the organizers of the program. It has been reported that due to some legal complications, project management authorities were able to use only 4 permits out of 10 issued during 1990.

**Results:** The preliminary results are quite encouraging. The populations of straight-horned markhor and Balochistan urial have increased from approximately 200 animals in 1985 to well over 400 in 1989 (Tareen 1990).

In spite of the fact that habitat and range rehabilitation takes a long time in a drought-prone area like Torghar, improvements are already noticeable. Vegetation is coming back and over-all range conditions have improved. Incidents of poaching have decreased considerably.

The success of the project can be judged by the fact that people from other mountains in the area are asking for similar programs in their areas.

**Intended Benefit to the Local Community:** The project is still in the early stage of development, thus the benefits accruing to the tribal communities are mainly in the form of employment of tribesmen as Game Guards. At present, about 31 tribesmen are employed under the project. Because the project provides the only outside employment opportunity in the area, it is bringing considerable income to the households of the Jalalzai tribe.

During each hunting season, 10 additional tribesmen were temporarily hired as porters or guides, and a handsome amount paid for their services. A young man of the Nawab's family is in the United States, receiving his education in wildlife management under the project. Hopefully, upon his return to the area, he will help in management of the project. Last year, 8 scholarships were awarded for high school education to the children of Jalalzais. In addition to the employment and education benefits, a program to provide social services, including improved roads, basic health services, water resource development, small scale reforestation, and establishment of orchard nurseries have been launched. Management authorities are also planning to obtain the services of a wildlife expert to study the improvement in the flora and fauna of the area.



**Conclusions:** One of the key elements in the success of this project is the recognition that participation of tribal people in a project aimed at conservation and utilization will contribute to saving unique wildlife resources of the area and in meeting local community and household needs.

Though organizers of the project have tried to involve sub-tribes inhabiting the area by providing employment opportunities and other social benefits, the program does not offer full participation in the decision making and problem solving process. Of course, the existing tribal system does not permit such participation at the community level, but communities in Balochistan are changing rapidly. The active participation of representatives of the sub-tribes in the project's management committee gives the community a voice in the decision making and problem solving process, and serves to inform community members of their responsibilities in implementing decisions made by the committee. This step will reduce the chances of any possible conflict among tribesmen and their chiefs in the long-run. The other big advantage of this approach is that it will set an example for other tribal areas of the Province.

The Torghar mountains are precipitous, rugged, and difficult for survey work. Thus, either total counts or sample counts may not reflect the true wildlife populations in the area. Surveys conducted through interviews with local people and herdsman may contain some biases. Therefore, any

conclusion about markhor and urial populations in the area should be based on careful studies on the population characteristics of these species.

The Provincial government is not actively involved in this project. The full endorsement by the government and other technical support can provide necessary legal protection. Finally, the policy of wildlife utilization and distribution of economic benefits among the local people have not been fully delineated. Elaboration of such policies will reduce the chances for misunderstanding between tribal chiefs and community members, and between the government and tribal chiefs. These steps will ensure long-term success of wildlife conservation projects.

As the Torghar wildlife conservation project is in its infancy, it can be considered a pilot project whose success or failure will likely affect wildlife conservation efforts in the Province for decades to come. (source: Tareen 1990 and his pers. commun.)

## Chapter V

### MANAGEMENT GOALS AND RECOMMENDATIONS

#### Management Goals

Management goals should be well defined and formalized for the conservation of natural resources. The goals described for global conservation (IUCN 1980) are to:

- a) maintain essential ecological processes and life support systems;
- b) preserve genetic diversity; and
- c) ensure sustainable utilization of species and ecosystems.

These goals can be further defined at regional, national, departmental, and specific area, even down to the level of an individual's role in an organization. Defining means by which these goals can be achieved is also important. Bell (1984) described the primary and secondary goals of conservation. He outlined the primary goals as: (1) preventing extinction of selected species of animals and plants; (2) maintaining selected biological communities within specified limits; and (3) preserving selected landscapes and features of particular aesthetic beauty,

cultural significance, or scientific interest. He listed the secondary goals as : (1) preservation of catchments and water resources without prejudice to primary goals; (2) consumptive and non-consumptive uses without affecting primary goals; and (3) generation of revenue without damage to primary goals.

Miller and Child (1984) suggested that, following the selection of goals of conservation, the manager and policy maker must address the following questions. To what extent do goals contribute positively or negatively to the surrounding local communities? How can these contributions be more positive? Are goals compatible with present legislation? Are there adequate natural resources? Are there sufficient manpower, skills, and executive capacity to achieve the goals? I think these are the questions that are crucial to any conservation and management program.

Wildlife management goals in Balochistan should be the protection, preservation, conservation, and management of biological resources. A profound program should be launched for the conservation and management of wild ungulates by restoring depleted populations and their habitats. Game animals can be used for the benefit of humans on a sustained basis without jeopardizing their survival.

Two philosophical principles can be applied while managing wildlife resources in the Province. First, all organisms, including man, have the right to exist. Second,

living resources should be preserved for the benefit of present and future generations of man-kind. The following specific goals for the conservation and management of wild ungulates in Balochistan are envisaged.

1. Protection and conservation of endangered wild ungulate species to save them from extinction. These species are the straight-horned markhor, chiltan wild goat, goitered gazelle, and chinkara gazelle.
2. Restoration of deteriorated habitats and protection from the destructive activities of humans of areas where small numbers of wild ungulates still survive. Such areas are present in north-eastern and southern Balochistan.
3. Reintroduction of chiltan wild goat, Balochistan urial, and chinkara gazelle, where habitats but no animals remain. Prior to any reintroduction program, knowledge of social behavior, spatial requirements, breeding biology, and feeding habits of these species will be required.
4. Establishment of a data base by collecting information on the current distribution and status of wild ungulates to be used for management strategies.
5. Conservation and management of wild ungulates by providing controlled trophy hunting on a carefully managed basis to hunters from Pakistan and abroad who can pay high fees for hunting permits. A large

- percentage of such fees must be given to local people to gain their support in protection of wildlife.
6. Involve tribal communities in conservation efforts through the provision of economic incentives and conservation education.
  7. Regulate meat hunting by local people on a sustained-yield basis, when populations of wild ungulates are adequate to sustain extensive hunting.
  8. Finally, enhance aesthetic values of wildlife and increase tourism in the Province by providing necessary facilities to the general public.

### **Management Recommendations**

Conservation implies efficient and continuing use through management of natural resources for the benefit of present and future generations. This concept has been widely accepted in North America, but in most developing countries like Pakistan, conservation is still considered to be preservation rather than "wise use". Clarke and Bell (1984) described 6 management options for wildlife as:

1. Preservation at ecological carrying capacity for non-consumptive uses.
2. Conservation below ecological carrying capacity for sustained use.
3. Capital reduction below ecological carrying capacity

for unsustained consumptive use.

4. Control to levels compatible with other forms of land use.
5. Captive breeding for consumptive or non-consumptive uses.
6. No management where the population is either insignificant or incapable of being managed.

Gilbert and Dodds (1987) presented 4 principles for management of wildlife. First, the geographic area to be managed should be divided into ecophysical regions. Factors like soil, vegetation, physiography, climate, water, human population, and access must be determined. Second, sound population estimates and distribution patterns of the species to be managed should be examined. Third, socio-economic structure and public demands in the area should be considered. Fourth, a management plan must be developed with options ranging from the most practical to the most desirable.

In Balochistan, wildlife management should focus on conservation for sustained use. Wildlife legislation such as the Balochistan Wildlife Protection Act, 1974 already exists. Protected areas including national parks, wildlife sanctuaries, and game reserves have been created. A primary management structure is available. Wildlife conservation problems have been identified in this paper. The management recommendations for each ungulate species will be given in

the management section. The following recommendations are made to over-come problems and to improve wildlife conservation in the Province.

1. At present, the Wildlife Wing of the Forest Department is headed by a DFO, Wildlife, who is assisted by 2 Assistant Conservators Wildlife (ACW), 3 Sub-Divisional Officers, 4 Rangers, 18 Deputy Rangers and 296 Game Watchers. This staff is insufficient to protect 3 national parks, 14 wildlife sanctuaries, 5 game reserves, and the vast country-side of the Province. Due to lack of administrative staff, personnel posted in far flung areas are not receiving full supervision, and management of wildlife is poor. To carry out wildlife protection and conservation more efficiently the existing Wildlife Wing of the Department should be strengthened by creating additional supervisory posts. An administrative setting for the Wildlife Wing is proposed in Fig. 13.

Presently, a tradition exists of filling newly created posts by temporary transfer from the Forestry sector; some posts even remain vacant for years because of problems with the service rules. The individuals posted through temporary transfer are often not interested in making adequate efforts for the conservation of wildlife. They know this is a temporary position, and they also have the excuse that wildlife management is not their field. A few wildlife management projects were ineffective in the past due to such



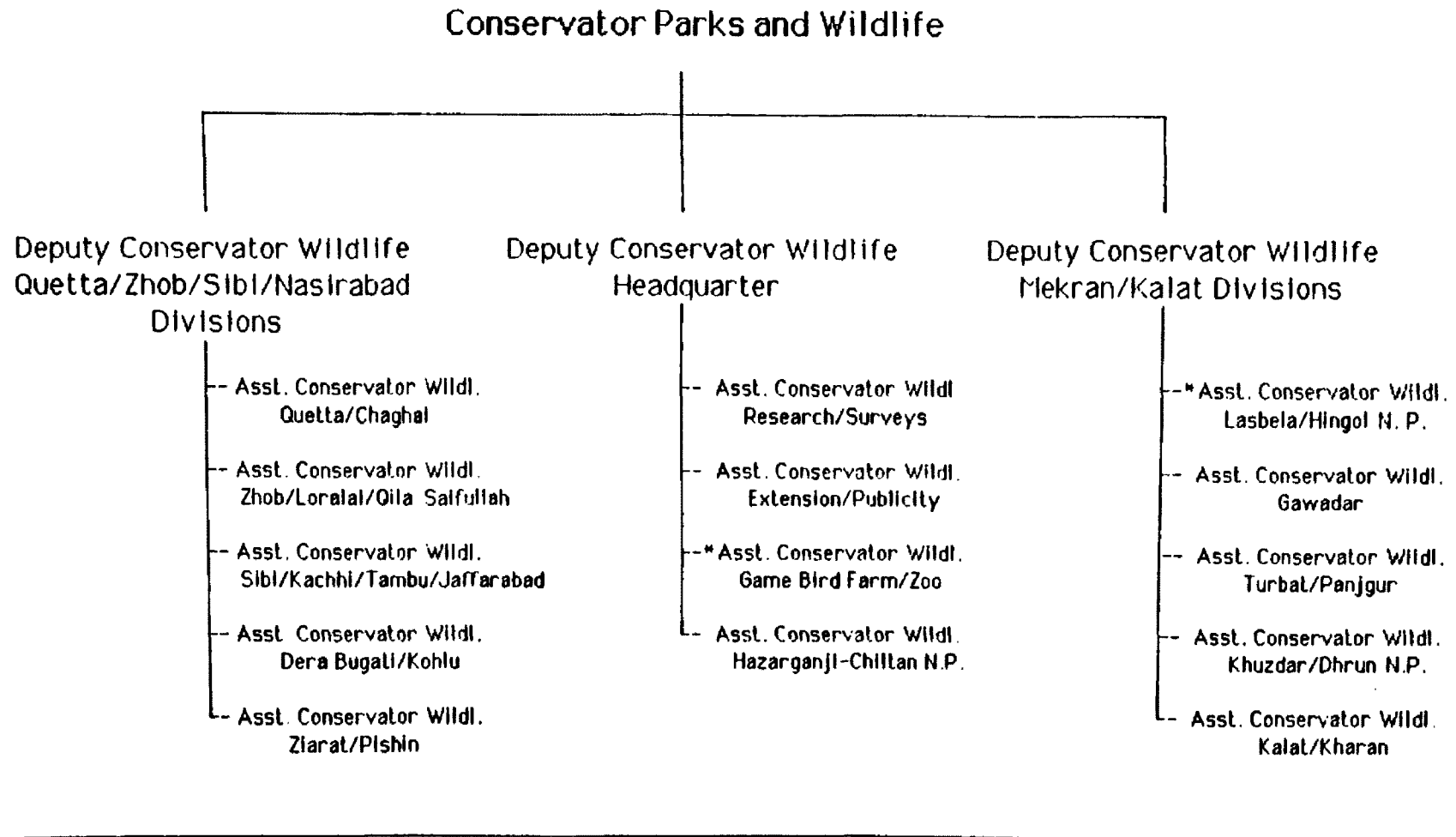


Fig.13. Proposed organization for the wildlife wing. Complementary staff has to be provided according to wildlife potential of each area. An \* indicates positions already available.

temporary arrangements. Therefore, instead of making temporary assignments, the Department should seek biology graduates for recruitment and train them for 2 years in wildlife management. The Balochistan Forest Department, Wildlife Wing, Service Rules, 1983 should be repealed, and necessary provision for recruitment quotas should be provided at the appropriate level. In addition to recruitment, training for existing staff will be necessary to develop comprehensive wildlife management plans. Such training programs should include wildlife surveys, identification of conservation problems, translocation of wild ungulate, techniques for habitat analysis, and formulation of a data base on Provincial wildlife.

2. Lack of information on current distribution and population status of wild ungulates is a major hurdle to initiation of management programs. The Department should develop a project for detailed surveys of wild ungulates with the help of the Zoological Survey Department and Pakistan Forest Institute. However, the best option for such surveys would be to arrange aerial surveys either from helicopters or fixed-wing aircraft. Aerial surveys of wild ungulates require a skilled observer, navigator, and pilot. Such surveys have not yet been conducted in Pakistan, therefore, at least 2 personnel should be sent for training in aerial survey techniques to other countries where such techniques may be learned.

3. Over-grazing by domestic livestock and indiscriminate removal of trees and bushes for fuel need to be stopped to allow regeneration. The Department should develop an integrated range management project in collaboration with the Livestock Department to introduce rehabilitation programs in the Province. Range and Livestock experts should come forward and educate local people about the values of range management. They should help tribal people in planning rangeland uses and in introducing different grazing systems suitable for the local conditions. To reduce pressure on natural vegetation, liquified petroleum gas as fuel for cooking and kerosene stoves should be made available in rural areas.

4. Although over-grazing by livestock and elimination of shrubs and trees for fuel-wood greatly reduced the carrying capacity of the land, the primary cause for the sparse wild ungulate populations is poaching. This should be controlled by improving anti-poaching measures in the Province. That can be improved by establishing special anti-poaching squads at each divisional level and providing them necessary equipment including vehicles, binoculars, mini-tape recorders, cameras, radio-wireless, camping gear, and fire-arms. Cooperation of local tribal chiefs for any anti-poaching campaign would be essential. All existing supervisory staff should be provided appropriate vehicles suitable for the terrain. All the Sub-Divisional Officers,

Rangers, and Deputy Rangers should be equipped with motor-bikes for prompt movement on a poaching incident in their jurisdictions. Game Watchers deputed for the protection of national parks, wildlife sanctuaries, and game reserves should be provided with bicycles. Construction of Game Watcher huts within the protected areas is essential to accommodate staff during harsh weather conditions. Special considerations should be given to improve public relations, so poaching and illicit grazing will be reported in time.

5. The Government should be requested to create posts of Head Game Watchers (Basic Scale-3) with at least 3 posts, particularly in those districts that are rich in wildlife resources (or 1 Head Game Watcher for the supervision of at least 4 Game Watchers). In addition to this, 3 posts of Head Game Watcher would be required for each national park. The potential for promotion will provide Game Watchers with an incentive for quality performance. Promotion to a Head Game Watcher should be based on extraordinary performance in the field and at least 5 years service as a Game Watcher.

6. The public is unaware of wildlife laws and the importance of wildlife conservation. The Department should create a Wildlife Extension and Publicity Cell (WEPC) within the Wildlife Wing to develop conservation education programs for the province. The WEPC should use mass media to publicize the importance of wildlife conservation and the provisions and penalties prescribed under the Act. This can

be done by publishing newspaper articles, through seminars, and radio and television talks. The WEPC should also arrange lectures, slide shows, and video movies on wildlife and the importance of its conservation for use in schools, colleges, and public places. A film on wildlife of Balochistan is being made, when completed, should be dubbed into local languages (Pushto, Balochi, and Brahvi) for showing to the tribal communities. Wildlife movies from other countries can also be imported and dubbed into Urdu (national language). These movies could be an effective tool to create general awareness among the masses. School teachers serving in tribal areas could be involved in the conservation education campaign by arranging short courses for them. They could be very effective in carrying the message of conservation because they usually occupy respected positions in the local communities. Pamphlets, brochures, and booklets containing information on local fauna and flora can also be developed and distributed to local schools and colleges. The Natural History Museum at Hazarganji-Chiltan National Park should be improved for educational and tourism purposes.

7. Current legislation is inadequate to meet the present demand of conservation and is ineffective in safeguarding against the degradation and destruction of wildlife habitat. Some provisions of the Wildlife Act are described very poorly, some species listed in the Act are not even found in the Province. To improve the legislation and its

enforcement for present and future needs, the following steps should be taken:

- a. Review the status of all species.
- b. Create provisions for controlled hunting.
- c. Create provision for trophy hunting and export fees for foreigners and local hunters.
- d. Create provision and fee for meat hunting.
- e. Enlist public participation.
- f. Improve administrative and judicial capabilities.
- g. Create provision for minimum fines and imprisonment.
- h. Increase the hunting, possession, and export fees.

8. The Department is already working for the special forestry and wildlife magistrates. These efforts should be intensified for the provision of special magistrates at each civil division for the quick disposal of offense cases. These magistrates should have powers for summary trial on serious wildlife offenses. If this is not possible, the Government should be asked to assign at least 1 day in a week for trials of wildlife offenses by only 1 magistrate at each district level. Law enforcement could be more effective if senior wildlife officers were given special powers to arrest poachers and persons involved in other illegal activities under the Act. They should be able to realize compensation to the Government for losses due to illegal activities in the protected areas. Such provisions in the

Act will improve the protection of protected areas. Visits by higher officials to wildlife areas could improve the law enforcement and conservation programs in the Province.

9. Wildlife research problems are numerous and spread over the entire Province. A Wildlife Research Unit has to be established at the Provincial level for consistency in surveys and research. This would require full time wildlife biologists, equipped with all necessary equipment and complementary staff. The equipment would include binoculars, spotting scopes, radio-telemetry, immobilizing material, net gun, capturing nets, etc. Books and reference material on wildlife management, ecology, biology, and behavior of wild ungulates and other wildlife species published in foreign countries would be required for research. Leading journals on wildlife management and other related fields should be subscribed to keep up on recent developments.

10. The ZSD, the PFI, and wildlife research institutions in foreign countries should be contracted for research on the management requirements of wild ungulate species. After seeking results of surveys and research, comprehensive management plans for both protected areas and wild ungulate species should be prepared. Those plans should address biological, social, and political factors. Biological factors include information on biology and ecology of each species and status of their habitats. Social

factors include participation of local people, public awareness of the present status of animals and the importance of conservation, and consequences of poaching and habitat destruction. Political factors include the availability of funds, possible conflicts, and well trained and equipped staff to implement plans.

11. Presently, it is difficult for the Provincial government to support extensive wildlife conservation programs. The Federal Government and NGOs in Pakistan should be approached to seek funds for wildlife conservation and management. In addition to this, international agencies like FAO, the World Bank, UNDP, IUCN, and WWF international should be asked for financial and technical support. International hunting organizations can play a significant role in funding through management and utilization programs. Such programs can be initiated by involving tribal people in conservation efforts. Projects for saving endangered species including straight-horned markhor, goitered gazelle, and chinkara can be submitted to IUCN, WWF international, WWF U.S., U.S. Fish and Wildlife Service, and WWF Pakistan for funding and technical advice on big game.

12. Conservation in Balochistan must take the aspiration of local people into account, because the survival of the wild ungulate species and their habitats ultimately depends on them. Thus, tribal chiefs and notables of the concerned areas should be approached, and costs and



benefits of conservation programs should be presented to them. Any conservation program must be accompanied by measures that improve the living standard of tribal people without further disrupting the environment. The future of wildlife in the Province depends on the willingness of local people to co-exist with wild animals and to prevent further deterioration of their habitats. The issue of local support is important and has been discussed in detail in the preceding chapter.

13. The Department should consider the option of reintroduction of wild ungulates into the areas where habitats remain but animals do not. This will depend on the ability to control the factors that caused the demise of the species in question. The activities that were detrimental to the species must be controlled. Prior to any reintroduction, the social behavior, spatial requirements, and feeding habits must be assessed in order to decide whether or not to re-introduce a species.

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