

The Role of Protected Areas in Saving the Sahel

John Newby
Direction des Eaux et Forêts
Niamey, Niger

ABSTRACT. *Using the Air and Ténéré National Nature Reserve, a proposed area of some 8 million ha, the study shows the immensely important role that protected areas and wildlife can play in the wise use of Africa's arid lands. Potentially valuable wildlife resources in the Sahel are rapidly declining because of over-hunting, but lack of funds forbids anything but cursory action to stop the decline and this is likely to continue until the wildlife totally disappears or its real potential is recognized and exploited. Throughout the Sahel the aim should be a mix of traditional forms of resource conservation and more modern land-use approaches such as wildlife culling within zoned conservation units; such zoning needs to be flexible and allow for changes in management as resource abundance and local imperatives change. Eventually it should be possible to transfer much of the decision-making and land management to the local populations, who can be expected to act rationally to their own advantage.*

1. INTRODUCTION

The Republic of Niger is on the verge of establishing its first nature reserve since Independence in 1960. The Air and Ténéré National Nature Reserve will, when created, not only be the largest protected area in Africa (8,015,000 ha) but also the first wildlife reserve in the Sahara. The following case study outlines the reserve's history and the rationale behind the decision to create it. In doing so, the study endeavours to emphasize the immensely important role that protected areas and wildlife can play in the wise use of Africa's aridlands and ultimately, in the rational, long-term development of their natural, cultural and historical resources.

Niger (1,267,000 sq km) is one of the vast Sahelian states that lie within and to the south of the Sahara.

Two-thirds of the country is made up of arid and hyper-arid habitats that receive less than 400 mm of rainfall annually. The vegetation of this Sahelo-Saharan zone ranges from sparsely wooded steppe in the south to the barren and waterless sand-seas of the Sahara in the north. Where there are mountains, enclaves of Sahelian vegetation grow in the valleys and drainage pans. In spite of its waterless nature, the Sahelo-Saharan zone was until recently the home of large numbers of highly adapted aridland ungulates such as the addax *Addax naso maculatus*, the scimitar-horned oryx *Oryx dammah* and several species of gazelle (*Gazella* spp.).

In 1979, IUCN, WWF and the Zoological Society of London, mounted a joint expedition to Niger. The expedition had two aims; to assess Niger's desert and sub-desert fauna; and to make concrete proposals to the Government of Niger (GON) on how its aridland fauna might be effectively protected. The expedition rapidly discovered two important facts:

- that Niger's aridland fauna was not only highly threatened but had largely disappeared from most of its recent range;
- that the mountainous areas of the Air and Termit were perhaps the last strongholds of Sahelo-Saharan wildlife in the country.

Considering the urgency of the situation, work was immediately started on studying the ecology of part of the Air and neighbouring Ténéré desert. Although the major aim of the survey was to inventory the natural resources of these areas, a great deal of time was spent quantifying habitat degradation, especially among the area's trees. The Tuareg nomads of the Air are comparatively sedentary and in an area devoid of large ex-

panses of grassland, the pastoralism they practise depends a great deal on the existence of healthy stands of browse species like *Acacia* trees; during drought years, trees may be the nomads' sole source of fodder. In 1979, the effects of the major drought that afflicted the Sahel during the late 1960s and 70s was most evident; many trees had died and others were in poor shape following over-utilization. However, even a cursory glance at the area under study revealed that unlike many other parts of Niger, wildlife was still varied and relatively abundant. Dorcas gazelles *Gazella dorcas*, Barbary sheep *Capra leucia* and ostrich *Struthio camelus* seemed particularly well represented and apart from the plains-living oryx, the other Sahelo-Saharan species could all be found.

Following its work, the expedition published a synthesis of its findings (Newby and Jones, 1980) to form the basis of a project proposal that would permit the GON to request funds for the establishment of a protected area in the Air. The expedition's report was greeted enthusiastically by the GON and prompted IUCN/WWF to initiate a specific project for the country (IUCN/WWF Project 1624).

In 1980, IUCN/WWF sent Newby back to Niger to assist the authorities in the preparation of an in-depth study of the Air and to outline concrete proposals for the establishment of a protected area.

While the fieldwork was being carried out, WWF began raising funds for the project. In 1981, the project's financial success was guaranteed when WWF International received an ear-marked donation US\$450,000 from an anonymous donor. In the same year in the United Kingdom, WWF secured a further US\$80,000 and the Fauna and Flora Preservation Society, Maxwell Preservation Trust Ltd., the People's Trust for Endangered Species and the Zoological Society of London joined forces to launch a fund-raising appeal called "Operation Scimitar Oryx". When the reserve is officially gazetted, the funds raised will permit the GON to undertake a comprehensive programme to conserve its aridland wildlife, flora and habitats.

2. THE ENDANGERED SAHELO-SAHARAN FAUNA

Concerned by reports from all over the northern arid zone of Africa that wildlife was severely threatened, IUCN, WWF and UNEP initiated a wildlife survey in 1975. The reports submitted (Lamprey, 1975; Newby, 1975a; Trotignon, 1975) showed that each of the principal large mammal species of the Sahel and Sahara had undergone serious reductions in their distribution. Many of the species could be classed as vulnerable, and the addax and scimitar-horned oryx were highly endangered and risked extinction unless prompt remedial action was taken. As a result of the project, a group of consultants met in Morges in 1976 and drew up a framework for the conservation of the Sahelo-Saharan fauna. The establishment of a comprehensive and well-run net-

work of protected areas was deemed necessary. At that time only one reserve existed, Chad's Ouadi Rimé-Ouadi Achim Faunal Reserve, and it was unanimously decided that the Chadian government be aided in maintaining its long-standing commitment to preserving aridland wildlife. Up until the escalation of civil unrest in 1978, the Ouadi Rimé reserve benefited from financial and technical assistance from IUCN/WWF (Project 1327). When the reserve finally had to be abandoned, the world lost its only Sahelo-Saharan wildlife reserve; with it went a sizeable proportion of the world's addax and, staggeringly, up to 80% of the total scimitar-horned oryx population. Among the areas recommended for action at the Morges consultation was the Air Mountains.

Six years after the Morges meeting, Africa is still without a valid Sahelo-Saharan wildlife reserve and the status of the region's mammals has considerably worsened. Addax exist in small remnant herds across the Sahara but the oryx is now restricted to two small areas in Niger and Chad. It is as yet too soon to know exactly how the Chadian wildlife has fared during the civil war but reports are far from encouraging. As the larger antelopes disappear, the smaller gazelles and the ostrich become prime targets for hunters. A status review of the Sahelo-Saharan fauna prepared for IUCN (Newby, 1981), shows that the current situation is precarious with the scimitar-horned oryx down to as few as 1500 in the wild.

3. THE FAUNA'S DECLINE

The decline of the Sahelo-Saharan fauna has been a spectacularly rapid one. During the 19th century, the first European travellers marvelled at the wealth of wildlife they found in the arid zone of West Africa (Barth 1958 ed, Nachtigal 1881). As late as the 1950s, wildlife populations were still considered abundant throughout much of the Sahel. A decade later, very little remained. Populations of oryx, addax, dama gazelle *Gazella dama*, slender-horned gazelle *G. leptoceros* and ostrich had been radically reduced by ruthless overhunting. Although the increase in the number of automatic weapons has had a drastic effect on wildlife numbers, the advent of desert-going vehicles makes hunting in the wide-open spaces of the Sahel child's play. Petrochemical and mineral prospectors, military and armed administrators were and still are the major culprits of the worsening wildlife situation. In spite of the fact that most Sahelian states have banned hunting, outlawed the possession of firearms and have specific laws to protect their aridland fauna, the carnage goes on and for the most part it is the legal possessors of arms who are responsible.

While over-hunting is by far the principal and most direct cause for the decline of the fauna, other factors are also important. Although adequately adapted to cope with arid conditions, wildlife suffers from prolonged drought through the disappearance of pasture. The desert ungulates have evolved migration to solve the prob-

lems posed on vegetation by a capricious climate. Within the zone, rainfall is totally unpredictable in time, space and quantity, and precipitation usually varies by more than 30% from one year to the next. Unfortunately, the expansion of rain-fed or irrigated agriculture is restricting migration patterns, often resulting in closer contact between man and wildlife and, invariably, increased hunting. The scimitar-horned oryx has particularly suffered, having been deprived of vital hot season grazing by domestic stock now that water for them is available. The possibilities to poach have also increased and because of poaching's sporadic nature, it is virtually impossible to control on a widespread front.

4. WILDLIFE FOR DEVELOPMENT

As has been indicated by increasing desertification and habitat degradation, economic development of the Sahel is a difficult task. The provision of permanent water, although allowing nomads regular access to hitherto difficult-to-exploit pastures, has led to overgrazing and the removal of the plant cover that prevents erosion and arrests desert creep. Under natural conditions, nomadism is kept in check by the availability of water and pasture and habitat overuse is rarely possible. Deep-well permanent water leads to sedentarism and sedentarism leads to overgrazing. Swift (1975) succinctly points out the pitfalls of the recent and widespread policy to develop nomadism along non-traditional lines. In addition, nomadic movement patterns are becoming cramped by agricultural development to the south, so the inherent capacity of nomadism to cope with fluctuating resource abundance is being destroyed.

In many ways, but to a lesser degree of perfection, nomadic pastoralism mimics the way in which the wildlife exploits its environment. Advanced physiological, morphological and behavioural adaptations permit wildlife not only to exploit marginal arid habitats but, considering the environmental constraints, to be highly productive. Unlike domestic livestock, Sahelo-Saharan wildlife needs no permanent water supply, most of the species being able to satisfy their water requirements by feeding on moisture-rich plants. Furthermore, through its diversity and selective feeding habits, the wildlife can exploit the various habitat strata without the risk of over-exploiting any one of them. Considering the waterless environment, the patchy distribution of pasture, the unpredictable rainfall and ecologically-sound productivity of the Sahelian fauna, every effort should be made to exploit wildlife as an economic resource valuable to humans. Unfortunately, wildlife in the Sahel is being treated as a last option when nothing else will work. At the risk of irking the protectionists that staunchly resist the logic behind the rational utilization of wildlife resources, it is probably fair to say that unless the practice can be initiated in the Sahel, the wildlife will go and go very rapidly indeed.

Apart from the production of meat and valuable

hides, tourism is another valid way of conserving wildlife under the auspices of economic development. Given a basic infra-structure of protected areas, tourism could become a lucrative prospect for localized communities and while, as Swift (1975) says, protected areas may be undesirable "... for the benefit of well-fed foreign tourists, scattered through an ecological wasteland inhabited by undernourished people," they could, if well designed, serve as useful test grounds for developing and demonstrating the economic viability and ecological supremacy of the Sahelian wildlife resource.

Realistic development of wildlife is being hampered both in and outside the Third World by the notion that protected areas must be inviolate. While there is a very definite need for the traditional type of park or reserve, conservation would be greatly encouraged if more emphasis were put on multi-purpose conservation zones and other management units. To survive, wildlife must be considered a harvestable crop rather than the anachronism it is becoming in ever-dwindling and encroached-upon preserves. New parks and reserves ought to be conceived and established with a view to a change in their function as and when the situation warrants. At the moment, it is imperative to protect the fauna as effectively as possible or it will soon become extinct, but we can be realistically optimistic that once protected, the wildlife will quickly increase to exploitable levels.

5. CONSTRAINTS ON PROGRESS: HUNTERS AND HUNTING

Unlike many ecological problems, the root cause for the disappearance of the Sahelo-Saharan wildlife is readily identified—over-hunting—and, theoretically, once identified is possible to combat. Secondary causes such as direct competition for land and loss of habitat through desertification or overuse are of minor importance for most species. Mining, for example, should pose virtually no threats to wildlife but as it is, the areas around mines are invariably totally hunted out. When the mines and minerals have gone nothing exploitable will be left at all.

Because of good wildlife laws, all hunting in Niger has been banned and is therefore illegal; yet it is widely practised in the absence of law enforcement. To understand something of the difficulties involved in controlling hunting it is necessary to look briefly at hunting itself. Most rural Africans are hunters at heart and probably will always be so as long as game exists. It is dangerous to be dogmatic about the effects of traditional forms of hunting on wildlife. In a context devoid of modifying factors such as modern weapons, vehicles and changing land-use patterns, traditional hunting, in spite of its widespread and often intensive nature, did not have a significant effect on wildlife numbers. Lack of water and great distances are serious constraints on hunting on foot, horse or camel. Observations made by

this author on traditional hunting in central Chad revealed that while the smaller and more numerous herbivores were hunted all the year round, the larger addax and oryx could only be hunted systematically during certain times. Oryx were most vulnerable during the hot season, and at the beginning of the wet season, when at the southern end of their migratory range. During the cold and later wet seasons, they could usually maintain sufficient distance between themselves and potential hunters. Observations on the hot season distribution of wildlife, when it is physically most vulnerable to attack, are of the utmost importance to the planners and managers of Sahelo-Saharan reserves. Exploiting this sort of information permitted park rangers in Chad to control oryx to such an extent that numbers rose by some 60% over a four-year period (Newby, 1980).

At the risk of being dogmatic, it is probably fair to say that, with the exception of particularly rare species, traditional hunting is still largely insignificant to wildlife numbers. What is perhaps more to the point, considering its widespread nature, is that it is virtually impossible to control.

Commercial hunting is another matter and in many parts of the Sahel has reached alarming proportions. Whole areas are being systematically hunted out and while the oryx, dama gazelle and ostrich have long since disappeared, the dorcas gazelle populations are rapidly dwindling. Hunting is carried out by professional hunters armed with artisanal firearms and wheel-type foot-traps and snares. The meat and hides obtained are prepared in the bush for clandestine sale in the larger rural centres. Considering the scale of operations in some areas, it is difficult to say whether the trade goes on because of the complicity or complacency of the local authorities. It is hard to believe that they are totally ignorant of it.

In spite of numerous private and more publicised warning from the highest authorities, the armed forces persist in hunting wildlife. They are often the only legal possessors of firearms and while they should theoretically uphold the laws of the land, are invariably the prime perpetrators of wildlife massacres.

In most Sahelian countries, wildlife and protected areas are the responsibility of the *Eaux et Forêts*. As in most francophone states, *Eaux et Forêts* action in the field of wildlife conservation centres on the repression of offences. In the vast Sahelian nations, total repression of hunting is an impossibility and even partial action in specific areas would require means beyond those currently available. By and large, there are adequate numbers of non-specialized field personnel but higher, well-trained cadres and equipment are sadly lacking. Even where there are vehicles for wildlife protection, funds for fuel, spares and repairs are totally inadequate for the task at hand. Considering the low priority that wildlife conservation enjoys, motives to do anything at the bush level is understandably poor. Rather than being a complaint, these statements are nothing but a realistic appraisal of the actual situation. Vast sums of money,

even if available to the governments, would rightly be used to better the more immediate needs of their people.

6. SOUND LIMITED ACTION AND THE WILDLIFE POTENTIAL

At its most terse, the wildlife problem in the Sahel can be stated thus: potentially valuable wildlife resources are rapidly dwindling because of over-hunting; lack of funds forbids anything but cursory action to stop the decline and this is likely to continue until either the wildlife totally disappears or its real potential is recognized and exploited.

The socio-economic constraints influencing the demise of the Sahelo-Saharan hardly leave room for optimism but without it, most wildlife conservationists would be long since redundant. "Never say die" is most certainly the catchphrase of the professional! It would appear that two prime requirements are prerequisites for the recovery and long-term health of the Sahel's fauna.

6.1. Critical evaluation of the potential of wildlife resources

Until now, the aridland wildlife has at best been treated as something that exists but that has no foreseeable long-term value. Like the minerals of the earth, it is for lack of insight being treated as an expendable non-renewable resource. Governments must ask themselves what wildlife can do for them in the Sahel. Considering the environmental and economic constraints on the Sahel and especially the thousands of square kilometres of marginal aridland, wildlife is ecologically an undeniable trump card. It is unfortunately often treated as an 'either/or' subject instead of being considered a valuable complement to other socio-economic activities. In the face of 21st century state-of-the-art technology and development, it is not considered 'sexy' enough to warrant serious consideration. While it would be totally unrealistic to suggest that, wildlife could replace livestock as the number one source of protein or provide an economic livelihood for rural populations, it may be feasible locally and once again, one must stress the complementary role that wildlife could play. In the past, a healthy wildlife resource has played an important role for nomadic and semi-nomadic peoples during periods of drought and famine--and drought is an old friend of the Sahel's. Just as it is wise to store grain for times of famine, it should be desirable to encourage the growth of healthy wildlife stocks.

Not least among the people to be convinced of the potential value of wildlife are the international funding and development agencies like the World Bank, the European Development Fund and the United States Agency for International Development. The policies, influence and money of organizations like these are virtually dictating the way in which Sahelian development

is going. There is urgent need for pilot-projects (Duncan and Esser, 1982) to prove once and for all that wildlife can not only be a valid alternative source of income and form of land-use but in some areas may well be the best form of land-use. It must be emphasized that aridland wildlife requires little or no management, no expensive wells to water it, no herders to ensure its access to grazing, little or no veterinary care to keep it in good health and, last but not least, no fears that it will degrade its habitat.

6.2. Sound limited action

Considering the social priorities and the economic restraints facing the Sahelian governments, nationwide action to conserve wildlife is impossible. Action must be selective and based on a careful assessment of potentials and priorities. There is no hope of success if the available funds are spread too thinly and properly conceived, specific projects not only stand a better chance of success but also of finding funds. The same comments also apply to the funding agencies. Instead of saying "we have 100 projects in 100 countries which may or may not succeed," would it not be better to say "we have 3 projects in 3 countries that are succeeding"? Evidently not and until funds for wildlife conservation can be truly internationally-secured, this is unlikely to happen. Funds need to be obtained and used objectively and not solely on the whims of charitable organizations and their albeit generous patrons—otherwise species are going to disappear before the general public has even realized they existed. Tough decisions are needed and need to be firmly adhered to. But who makes the decision to cut off the rhino and save the oryx because it could feed people? And besides, the sale of rhino horn and ivory could also feed people if taken out of the hands of wildlife's mafia of profit-hungry entrepreneurs. This may well sound like heresy to orthodox conservationists but it might just be the only way to keep animals like the rhino and elephant alive in the decades to come. Would this be acceptable? Or will we just sit around blithely discussing the ethics of such an action while the species disappear inexorably into oblivion?

7. ACTION IN NIGER

The creation of a protected area in the Air Mountains and Ténéré Desert (Fig. 1) of Niger is a good example of realistic planning and use of valuable natural and cultural resources. The decision to establish the protected area was motivated by five main factors:

- the disappearance of the aridland fauna;
- the increase in habitat degradation;
- the destruction of rich archaeological sites;
- the desire to conserve a part of Niger's natural

heritage for aesthetic, cultural, educational and scientific reasons; and

- the desire to broaden the country's tourist infrastructure.

The protected area was conceived with the aim of maintaining, as far as possible, the traditional forms of land-use, not to evict or compromise the lives of the people who live within and off the area's resources.

The actual zone chosen was selected on the strength of 10 other criteria:

- wealth of fauna;
- great floral variety;
- wealth of geographic, topographic and geological features;
- outstanding cultural, historical and pre-historical value;
- highly important tourist potential;
- possibilities of managing and protecting the zone efficiently;
- low population density;
- presence of a road network making it accessible;
- presence of an existing administrative infrastructure; and
- overall outstanding beauty among Niger's and the Sahara's aridlands.

More important, it will provide the GON with a prestigious focal point on which to concentrate its various commitments to conservation, rural development and tourism.

Unlike many protected areas that are created on the strength of one or two outstanding features, it was decided to inventory as large an area as possible, study its demographic and socio-economic characters and then delimit boundaries that would best attain the project's aims, the chances of success and the hopes focussed on the region. Between 1980 and 1982, seven lengthy fieldtrips were carried out by the WWF consultant and technicians from the *Eaux et Forêts*. While new areas were visited on each trip, a regular programme of ecological monitoring and wildlife census was initiated. Although an inventory of all the area's natural resources might take years to finish, a useful framework has been established within which new data can be inserted and updated. Apart from the people directly involved in the fieldwork, the regional *Eaux et Forêts* personnel have benefitted from the wealth of information on areas that they rarely visit through lack of means. The establishment and subsequent running of the reserve will greatly enhance the regional infrastructure and its efficiency. The fieldtrips and subsequent analysis of data have provided the Nigerien technicians with valuable training in ecological survey, practical conservation and game management. It has initiated many to the techniques of fieldwork, data collection and analysis. Furthermore, it has been valuable at all levels in bringing out the potential importance of wildlife. To many people it came as a

pleasant surprise that wildlife still existed in the area at all.

The boundaries eventually selected for the reserve were chosen after much critical scrutiny and in accordance with a number of factors predetermined as being highly important. These were:

- Validity in terms of the biological requirements of the wildlife;
- ease of recognition;
- the possibility of controlling the delimited area; and
- the inclusion of potentially valuable tourist assets

The work of delimiting the reserve was greatly aided by the previous experience gained in managing Chad's Ouadi Rimé reserve. Although predominantly sub-desert in character, the reserve is similar in size (7,795,000 ha), harbours a similar fauna and is influenced by comparable socio-economic and environmental factors.

8. STEPS TO COME

In way of a conclusion it will be useful to briefly outline the various steps and procedures required before the proposed national nature reserve is officially designated and legally gazetted. Although the scientific aspects of the proposal have already met the approval of the administration's technical services, the documentation requires study by both the higher national and regional government and by the traditional authorities in the region where the reserve will be situated. Comments and criticisms made at these levels will be evaluated and amendments or modifications made as and where necessary. After approval by the Council of Ministers, a decree will be prepared for signature by the Head of State.

While all this is going on, *Eaux et Forêts* will have initiated the recruitment of personnel for the reserve. Plans will be made as to equipping the reserve, managing it and budgeting for its running. In the early stages planning must be open-ended to allow for changes as and when these become necessary or obvious in the light of experience and the tasks at hand. Once the nuances of everyday work become apparent it will be easier to deal with longer-term objectives such as habitat and vegetation rehabilitation. It will also be easier to recognize and exploit the possibilities to include the local population not only in the management of the area but also in planning the policies that will govern land-use and natural resource utilization.

Not only in Niger but throughout the Sahel, we should ideally be aiming at a mix of both traditional forms of resource conservation and more radical (to traditionalists) land-use possibilities such as wildlife culling within zoned conservation units. Zoning needs to be flexible and to allow for changes in management as factors such as resource abundance and local imperatives change. Eventually it should be possible to transfer much of the decision making and land-management to the local populations for their benefit, the region's and that of the nation.

By comparison with what is happening in most of the world's protected areas at the moment, these ideas may sound like futuristic pipe-dreams but the time is rapidly approaching when nothing but radical concepts will satisfy the needs of mankind and wildlife alike. The sooner these concepts are tried, the sooner we can be satisfied that all our efforts have not been in vain.

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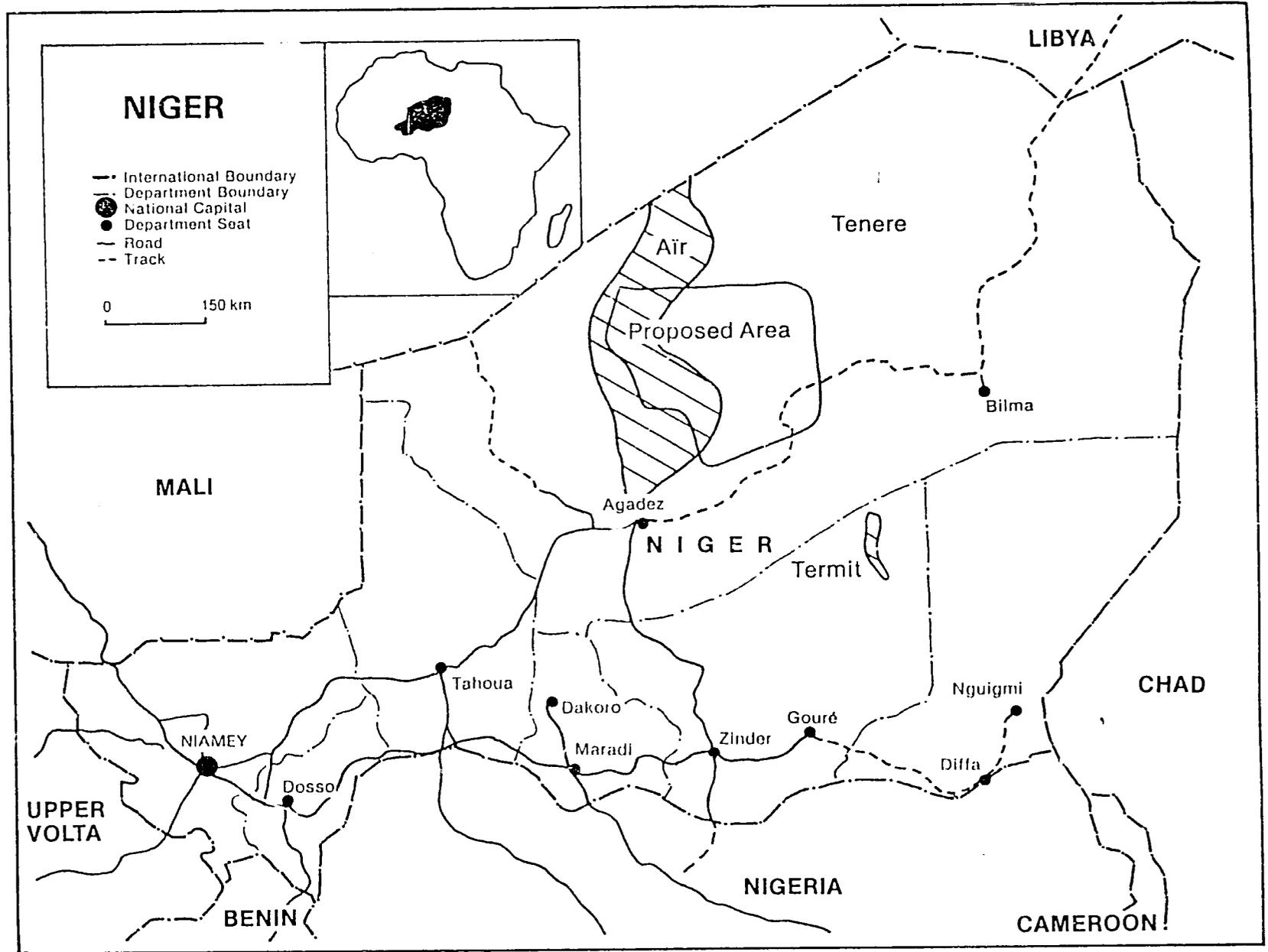


Figure 1. Proposed protected areas in Niger.