



AERIAL SURVEY OF THE DESTRUCTION OF THE ABERDARE RANGE FORESTS



Report prepared by:



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FOREWORD

Kenya presents striking contrasts. Over the years, closed-canopy forests have been destroyed and their area reduced to less than two percent of the total land area. At the same time, key economic sectors, including cash and subsistence crop production, tourism and energy generation, have increasingly relied on the environmental services provided by our shrinking forests. Among them, the Aberdare Range forests provide an exemplary illustration of this dichotomy.

As one of Kenya's five main "water towers", the forests of the Aberdares play a critical role in supporting the country's economy. They are the main source of water for Nairobi. 55 percent of Kenya's electricity is generated by water flowing from the Aberdares and Mt. Kenya. However, over the last decades, most of the forests of the Aberdares have been the focus of irregular settlements and large-scale illegal exploitation, such as charcoal production and logging of indigenous trees.

Factual information about what is happening in our forests is important and yet not readily available. I am therefore grateful that the United Nations Environment Programme, Kenya Wildlife Service, Rhino Ark and the Kenya Forests Working Group carried out the aerial survey of the Aberdare Range forests. The report provides unequivocal data on the state of degradation of the Aberdare Range forests. I am dismayed by the wanton destruction wrought upon this invaluable ecosystem, but I am pleased to note the positive impact of some conservation measures, in particular the fencing of forest areas.

The Government is committed to improving the current situation in the Aberdares that calls for urgent policy responses. My Ministry will take effective actions to address forest degradation and to ensure the conservation of the Aberdare forests for the benefit of present and future generations.



Hon. Dr. Newton Kulundu, M.P.
Minister
Ministry of Environment,
Natural Resources and Wildlife

ACKNOWLEDGEMENTS

The request for the aerial survey of the forests of the Aberdare Range was originally presented by Rhino Ark. The objective was to identify the type, extent and location of the threats to the forests and provide an assessment of the impact of fencing on forest conservation. The request was inspired by similar aerial surveys that were undertaken for the forests of Mt. Kenya in 1999 by Kenya Wildlife Service with support from UNEP and for Mt. Kilimanjaro in 2001 by UNEP, Kenya Wildlife Service, University of Bayreuth and the Wildlife Conservation Society of Tanzania with support from UNDP/Small Grants Programme and the United Nations Foundation.

The survey would not have been possible without the support of Mr. Joseph Kioko, former Director of Kenya Wildlife Service, and Mr. Dan Claasen, Acting Director of the Division of Early Warning and Assessment, UNEP, who agreed to detach Mr. Bongo Woodley and Mr. Christian Lambrechts, respectively, to undertake the survey flights and allocate them the time required for the production of the report. Mr. Gideon Gathaara, Chief Conservator of Forests, Ministry of Environment, Natural Resources and Wildlife, endorsed the idea of the aerial survey and expressed full support. The endorsement and support by the authorities have been critical to the successful undertaking of the survey and are very much appreciated.

Rhino Ark, with assistance from Mr. Bill Jordan, UNEP and the Kenya Forests Working Group, with funding from the European Community, provided the much needed funds for the survey and the printing of the report. The views expressed herein are those of the authors and can therefore in no way be taken to reflect the official opinion of the funding organizations.

Finally, we wish to thank Fleur Ng'weno who kindly edited the text of the report and Anthony Mwangi who finalized the layout.

The Survey Team



I. BACKGROUND

In 2002, Rhino Ark requested UNEP, Kenya Wildlife Service (KWS) and the Kenya Forests Working Group (KFWG) to undertake an aerial survey of the Aberdare Range forests, similar to the survey undertaken on Mt. Kenya in 1999 and on Mt. Kilimanjaro in 2001.

The survey responded to increasing public outcry about widespread forest destruction in the Aberdares. Over the past few years, a number of civil society organizations have been reporting on illegal destructive activities in the Aberdare Range forests, in particular on the southern and western slopes. In November 2000, KFWG sent a fact-finding mission to Kieni, Ragia and South Kinangop forests on the south-western slopes. The mission revealed extensive indigenous forest destruction in critical catchment areas, large scale encroachments, as well as rampant charcoal production. Although some few localised actions were taken, the overall situation on the ground did not show any significant improvement. Illegal activities went on unabated in many areas.

Since its inception in 1987, Rhino Ark has launched a number of initiatives aimed at conserving the Aberdares, its habitats and wildlife. These initiatives include the construction of 320 kilometres of fence around the Aberdare Range forests to reduce human-wildlife conflict and protect the natural ecosystem from illegal exploitation. To date some 160 kilometres of fence have been erected and country-wide fund-raising activities are under way to secure the necessary funds for the completion of the fence. In this regard, the survey was to provide Rhino Ark's donors with an accurate appraisal of the situation on the ground and the impact of the fence on the state of conservation of the Aberdares.

It is expected that the information generated through the aerial survey will help all stakeholders to identify appropriate intervention measures to address the threats to the Aberdares. The survey report and the maps can also be powerful awareness-raising instruments that, hopefully, will catalyze the required support at local, national and international levels to ensure the conservation of this invaluable natural ecosystem.

II. GOAL AND OBJECTIVES

The main goal of the aerial survey was to provide factual information on the type, magnitude and location of the main threats to the forests of the Aberdare Range. It will help stakeholders to determine the effectiveness and weaknesses of current management practices and to adopt new policy and management decisions for the long-term conservation of the forests. The specific objectives were to:

- (a) Categorise the type, magnitude and location of the threats, in particular destructive activities, in the forests of the Aberdare Range;
- (b) Provide a well documented, systematic and factual assessment of the current threats to the forests that could be useful for improved management;
- (c) Enhance awareness of the current threats to the forests and the value of the mountain ecosystems; and,
- (d) Assess the impact of fencing the Aberdares on the conservation of the forests.



III. BRIEF DESCRIPTION OF THE ABERDARE RANGE FORESTS

A. Overall description

The Aberdare Range is located in central Kenya on the Equator. The Range stretches over 125 kilometres from Nyahururu in the North to Limuru in the South. It is the third highest mountain in Kenya, with two main peaks, Oldonyo Lesatima (also known as Sattima) and Kinangop, which reach, respectively, altitudes of 4,001 and 3,906 metres. The Range presents a deeply dissected topography sloping gradually to the east. In contrast, the western side drops along impressive fault escarpments towards the Rift Valley.

The climate of the Aberdare Range is generally characterised by two rainy seasons - from April to May, and October to November. Rainfall varies with altitude and exposure to the dominant wind from the Indian Ocean, but reaches a maximum of around 2,600 mm annually on the south-eastern slopes and drops to less than 900 mm a year on the northern and south-western lee slopes.

Various vegetation zones can be distinguished on the Aberdare Range, including the closed-canopy forest belt, the bamboo zone, the sub-alpine and alpine vegetation. The forest belt covers a major part of the range. Most of the forest is gazetted as forest reserves. However, parts of the upper forest zone fall within the Aberdare National Park.

The forest belt of the Aberdare Range is characterised by a high diversity of forest types, because of the wide altitudinal range (from 1,800 to 3,600 metres) and the climatic differences between the slopes.

B. Water Catchment

The Aberdare Range plays a critical role in water catchment for the country and is one of the five main “water towers” of Kenya with Mt. Kenya, Mau Complex, Cherangani Hills and Mt. Elgon, all providing most of the nation’s water.

The Aberdares are the main catchments for Sasumua and Ndakaini dams, which provide most of the water for Nairobi - a city of more than two millions people.

The eastern slopes are catchments of the Tana River, Kenya’s largest river, that supplies water to the Seven Forks hydropower plants where over 55 percent of Kenya’s total electricity output is generated. It also feeds major irrigation schemes such as Mwea rice scheme, Bura settlement scheme and the Tana Delta irrigation scheme. The south-eastern slopes form the upper catchments of the Athi River, the main tributary of the Sabaki River that drains into the Indian Ocean. The northern slopes are catchments for the Ewaso Nyiro River, the main river crossing the semi-arid Laikipia plateau and the Samburu plains and deserts beyond. The Malewa River, the major surface source of water for Lake Naivasha, originates from the north-western slopes. The adjoining districts and, in particular, the high densely populated areas on the eastern and southern slopes rely primarily on the water flowing from the Aberdare Range (Map 1).

C. Biodiversity

Ecosystems

The Aberdares have a rich diversity of vegetation types that result mainly from the wide range in altitude and rainfall (see Table 1 and Map 2).

Flora

The Aberdares host a wide variety of plant species. A study carried out in 1986-88 identified 778 species, subspecies and varieties in the Aberdare National Park alone (Schmidt, 1991).

Common hardwood tree species include Camphor (*Ocotea usambarensis*), Cedar (*Juniperus procera*), Podo (*Podocarpus*



latifolius) and *Hagenia* (*Hagenia abyssinica*). Other notable plants include the Aberdares endemics: *Lobelia deckenii sattimae* and *Helichrysum gloria-dei*, and the Aberdare/Mt. Kenya endemics *Lobelia bambuseti* and *Senecio keniodendron*.

Table 1: Major vegetation types of the Aberdares*

Vegetation zone	Altitude (m asl) / Location	Characteristic tree (and shrub) species
Montane forest zone - Moist forest	1900 - 2500 / East 2100 - 2500 / South-East	- <i>Cassipourea malosana</i> , <i>Ekebergia capensis</i> , <i>Teclea nobilis</i> , <i>Calodendrum capense</i> , <i>Podocarpus latifolius</i> , <i>Nuxia congesta</i> - <i>Ocotea usambarensis</i> , <i>Macaranga kilimandscharica</i> , <i>Neoboutonia macrocalyx</i> , <i>Tabernaemontana stapfiana</i> , <i>Prunus africana</i>
- Dry forest	1800 - 2400 / South-West 2400 - 3300 / West 2300 - 3200 / North, North-East	- <i>Juniperus procera</i> , <i>Calodendrum capense</i> , <i>Teclea simplicifolia</i> - <i>Juniperus procera</i> , <i>Olea europaea (africana)</i> , <i>Podocarpus falcatus</i> , <i>Nuxia congesta</i>
Bamboo zone	2400 - 3000 / East, South-East 2700 - 3300 / West	- <i>Arundinaria alpina</i> with scattered trees, including <i>Podocarpus latifolius</i> and <i>Nuxia congesta</i>
Hagenia-Hypericum zone	2950 - 3500 (discontinuous)	- <i>Hagenia abyssinica</i> , <i>Hypericum revolutum</i> , <i>Rapanae melanophloeos</i>
Ericaceous zone	2900 - 3560 (discontinuous)	- <i>Erica excelsa</i> , <i>Erica trimera</i> , <i>Erica arborea</i> , <i>Cliffortia nitidula</i> , <i>Helichrysum nandense</i> , <i>Stroobe kilimandscharica</i>

* The description of the main vegetation types is based on the work by Ng'ang'a (1990), Schmidt (1991) and KIFCON (1994).

The description aims at providing an overview, but does not give a detailed account of the vegetation cover.

Fauna

The Aberdare Range forests host a number of threatened fauna species. The Jackson mongoose (*Bdeugale jacksoni*), endemic to Kenya's montane forests and the rarely seen golden cat (*Felix aurata*) are two threatened mammals. Other large threatened mammals of international conservation interest that occur in Aberdare forests are bongo (*Tragelaphus euryceros*), giant forest hog (*Hylochoerus meinertzhageni*), black rhino (*Diceros bicornis*), elephant (*Loxodonta africana*), leopard (*Panthera pardus*) and African hunting dog (*Lycan pictus*). In addition, the forest harbours bushbuck (*Tragelaphus scriptus*), mountain reedbuck (*Redunca fulvorufula*), waterbuck (*Kobus ellipsi prymnus*), cape buffalo (*Syncerus caffer*), suni (*Neotragus moschatus*), side-striped jackel (*Canis adustus*), eland (*Taurotragus oryx*), and varieties of duikers and bushbabies.

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