A Proposed Management Plan for Ethiopia's Nech Sar National Park

View from Nech Sar Plain onto Lake Chamo ©Alison M. Jones 2005

By Alison M. Jones
140 Thompson Street
New York, New York 10012
www.alisonjonesphoto.com

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EXECUTIVE SUMMARY

INTRODUCTION

Nech Sar National Park is in Africa's Great Rift Valley, 500 miles southwest of Addis Ababa, Ethiopia. Its core is a land bridge between Lake Chamo to the south and Lake Abaya to its north with the Guge Mountains and Sidamo Hills as backdrops. The diversity of its ground water forest, savanna acacia forest, open savanna, escarpment walls, highland acacia forest, hot springs and lakeshores is Nech Sar National Park's greatest asset. Other assets include the world's largest population of Swayne's hartebeest and an unusually large population of crocodiles found with in a small area of just 514 square kilometers.

For centuries this area was uninhabited. Then the park was gazetted in 1962. There was scant management, which sufficed until Ethiopia's population exploded in the last twenty years when new communities settled within Nech Sar National Park. The ensuing results of deforestation, grazing cattle, human habitation and overfishing in the park have caused severe stresses and degradation of ecosystems in the park, leaving the sustainability of Nech Sar National Park's resources in question. In February 2005 the government, consumed with other humanitarian and political priorities, granted management of Nech Sar National Parks to African Parks Foundation, a private management group working in developing African nations. Despite a desperate need to establish baseline species inventories, African Parks Foundation's first managerial challenges have been dealing with the consequences of the government's decree that all who have recently established residence in the Park must leave. In reaction, Refugees International has claimed such resettlement is unjust.

As the population around Nech Sar National Park and nearby Arba Minch increases, so do the pressures to graze cattle, fish and collect wood in the park. In the face of this challenge, the Ethiopian government and African Parks Foundation have planning how to work with the local communities while ensuring the preservation of this park – a valuable asset for Ethiopia and

global biodiversity. Many Ethiopian national parks seem to be beyond repair, but Nech Sar National Park is still salvageable in the opinions of African Parks Foundation and this author. As Nech Sar National Park is one of the few protected areas in Ethiopia's Rift Valley there is a heightened urgency to create a management plan.

In December 2005 students in "Forest Ecology and People: Principles and Practices" (Columbia University's CERC course ENVB N0329) taught by Professor Robin Sears were assigned to design a management plan for a "favorite forest." This author's choice of the forests and habitats of Nech Sar National Park stem from a visit to this and other Ethiopian national parks in September 2005; from a seven-year association with a private management model in Kenya's Mara Conservancy, and from twenty years of travel in Africa. This proposed Management Plan is written for those interested in forest ecology, particularly in Africa where issues are framed by the demands of increasing human populations, and for those focusing on the role of private management in countries overwhelmed by the demands of poverty, droughts, illiteracy and disease.

LONG-TERM CONCEPT PLANS

Effective long-range plans can only be undertaken when an inventory establishes species currently in Nech Sar National Park and after research determines limits and conditions for sustainability of species deemed appropriate to habitats in Nech Sar National Park. It is recommended that long-term concept plans use the same parameters that guided the formation of this management plan:

- Value and fragility of the park's natural resources
- Community sensitivities to an increased presence of foreign tourists
- Ongoing tourism appeal and what conditions could change tourist appeal
- Local support systems available for increase in numbers of tourists
- Other local or regional cultural or natural sites of interest that could be connected to tourists' visits to the park
- Possible pressures and disruption caused by changes in surrounding land use
- Possible destructive intrusions of the park's wildlife outside the park
- Need for a positive relationship between Africa Parks Foundation and the government
- A safe infrastructure for tourists' viewing
- Rules to protect tourists from wildlife
- Rules to protect flora and fauna from tourists' footprint and behaviors
- Elements that can enhance all tourists' enjoyment

STRUCTURE OF PROPOSED MANAGEMENT PLAN

This Management Plan is built on the thesis that tourism revenue is the key to saving wildlife and ecosystems and to improving the welfare of local people. The plan is presented in four sections to address all the resources of Nech Sar National Park and nearby communities.

Environmental objectives address:

- Maintaining current biodiversity, and possibly restoring appropriate, sustainable species
- Establishing sustainable habitats for Swayne's hartebeest and other wildlife
- Controlling invasive plants
- Regenerating flora consumed by cattle in the ground water forest
- Disseminating information on NSNP 's species and resource management

Economic objectives address:

- Finding revenue streams to support park management expenses and improvement of local communities

Community-based objectives address:

- Compensating local people for previous dependencies on park resources
- Involving of local people in management
- Sharing tourism revenue with local communities to enhance their lifestyles
- Educating local people as to the value of NSNP as a national global resource

Access/utilization objectives address:

- Instituting infrastructure and regulations to protect the park
- Improved visiting experiences and dissemination of scholarship on the park

CONCLUSION

Nech Sar National Park is a jewel in the crown of Ethiopia's National Parks, valued for its physical beauty, endemic species, and diversity ranging from lakes to mountains. Since the park is not yet ruined by human incursion, as are many of Ethiopia's other parks, this proposal for a management plan is written in hopes that Ethiopia, Africa Parks Foundation, ecologists, philanthropists and conservationists worldwide will together support the preservation of this and other such special parks. Ethiopia on its own does not have the resources to accomplish this goal. Private management, which has succeeded in preserving Kenya's Mara Conservancy, would seem to be the most efficient vehicle for achieving stability in Nech Sar National Park.

OVERVIEW of MANAGEMENT PLAN OBJECTIVES & ACTIONS to follow in next section of this document. Numbers (1, 2, 3) following the actions indicate timeline priorities.

ENVIRONMENTAL OBJECTIVES

TO CREATE AND PUBLISH A SCIENTIFIC BASELINE INVENTORY
Find researchers to begin the inventory and identify local assistants 1
Set a timeline and a system for compiling inventory 1

TO RESEARCH HABITAT CONDITIONS NEEDED for FLORA AND FAUNA
Investigate local and informal information sources 1
Find specialists for this research 2
Determine hiring guidelines 2

TO RESEARCH WATER RESOURCES, EROSION CONTROL & FLOOD REDUCTION
Repair deforested and eroded areas 1
Analyze each source of water 1

TO ESTABLISH CRITERIA AND PLANS FOR CREATING
A SUSTAINABLE HABITAT FOR PARK'S CURRENT FAUNA
Improve protection of ecosystems from cattle degradation and over-fishing- 1
Support fish populations in Lake Chamo needed as food for crocodiles 1
Research possibility of buffer zone acquisition 1
Protect wildlife from poaching 2
Study impact of re-introduction of wildlife species 2

TO ESTABLISH CRITERIA AND PLANS FOR CREATING
SUSTAINABLE HABITATS FOR PARK'S INDIGENOUS FLORA
Prevent further illegal grazing or harvesting 1
Remove invasive species 1
Study and institute most appropriate burn policy 2
Encourage regeneration of eroded areas 2

ECONOMIC OBJECTIVES

TO INCREASE TOURISM REVENUE
Determine sustainable levels of tourism and set goal for percentage of increase 1
Raise entry fee 1
Begin marketing tourism agencies and drivers 2
Meet monthly with local tourism providers 2

TO MARKET NSNP AS MOVIE SET AND FILMING LOCATION
Research means to do this 3

TO FIND DONOR SUPPORT
Tag NGO's and donors to be approached 3

TO INSTITUTE A CONSERVATION FEE
Study best means to do this and institute if deemed appropriate 3

COMMUNITY-BASED OBJECTIVES

ACCESS AND UTILIZATION OBJECTIVES

PROPOSED MANAGEMENT PLAN for NECH SAR NATIONAL PARK

It is absolutely essential that man should manage to preserve something other than what helps to make soles for shoes or sewing machines, that he should leave a margin, a sanctuary, where some of life's beauty can take refuge and where he himself can feel safe from his own cleverness and folly. Only then will it be possible to begin talking of a civilization. --Romain Gary, Les Racines du Ciel

INTRODUCTION

PROJECT ANALYSIS: In the center of Ethiopia's Nech Sar National Park environmental degradation threatens its ecosystems and floral and faunal species. Kenya's Mara Conservancy, under a similar dire threat five years ago, is an example of management successes and failures to be considered by those administering Nech Sar National Park.

PROJECT OVERVIEW: Nech Sar National Park is in crisis: there has been severe degradation of its diverse habitats for endemic, endangered species and of its unique groundwater forest. The Park needs a management plan immediately to survive and become sustainable in the face of pressures of increased human population. Funding for this for now must come from nongovernmental foreign sources. Ethiopia, overwhelmed by famine, poverty, and lack of education and health resources, is unable to place conservation at a high priority level. The government, limited to awarding a management contract to an appropriate overseer, is to be credited with the foresight to recognize the value of the park and the benefit of private management of Nech Sar National Park.

One of sub-Saharan Africa's best models for private management of wildlife and ecosystems is Kenya's Mara Conservancy. Yet five years ago, this habitat that supports a migration of two million wildebeest and zebra was in similar circumstances to Nech Sar National Park's

today. Its management of successes and failures can be used by the management planners for Nech Sar National Park. The Mara Conservancy's Board of Directors, half of which are Maasai, has restored ecological balance and vital revenue streams to the western third of the Maasai Mara Game Reserve. This land, owned by Maasai but dedicated to use as a wildlife reserve for tourism, is the same size as Nech Sar National Park. Protecting natural resources from climate change and expanding human populations today in developing nations struggling with drought, disease, illiteracy and political instability is a costly challenge. In comparing the Mara Conservancy and Nech Sar National Park throughout the bottom-up process of building a management plan; there are ecological and political lessons to be learned, as well as potentially exciting implications for a broader, global approach funding such ecosystems struggling to survive. Private management success in Nech Sar National Park, based on an informed management plan, can further support a new conservation concept of establishing an endowment for financial start-up and maintenance assistance to such reserves.

RESOURCES: During November and December 2005, this author collected information from national and international resources on the ecology of Nech Sar National Park's species of flora and fauna and its forest structures. Information was gleaned from one prior site visit, a telephone discussion with Nicholas Lapham, President of African Parks Foundation of America, email dialogues with Brian Heath, Chief Executive of the Mara Conservancy in Kenya, and emails with Mark Chapman, owner of a community-based travel business in Ethiopia. Pertinent books, magazines and websites also were used and are noted in this document's Bibliography.

SITE ANALYSIS: This document's "Natural Features Analysis and Social Analysis" is scant due to the limited information available. More thoroughly discussed herein are the current and potential uses of park resources, and the management opportunities and conflicts to be addressed. Analyses of the park's natural features cite the unusual variety of natural resources and wildlife habitats within this relatively small park's boundaries; the great potential for enjoyment by international and Ethiopian tourists, students and scientists of this northern stretch of Africa's Great Rift Valley; and today's issues surrounding threatened species, deforestation and over-fished lakes.

The social analyses of Nech Sar National Park reveal the competing claims for this land by indigenous wildlife and surrounding human populations. Careful attention needs to be taken to address these issues and reimburse all displaced communities.

EXPLANATION OF NAMES: The derivation of the name of Nech Sar National Park is that "*nech sar*" in Amharic means "white grass," a prevalent and beautiful feature of the park's savanna. However the park has also been called "Nechisar National Park," thought to be an easier pronunciation for Westerners. According to Philip Briggs, suggestions were being made in 2002 that the park may be renamed the Southern Rift Valley or Arba Minch National Park, because to locals the name "Nech Sar" refers specifically to the plains, not the entire park. This plan to rename the park has not yet been effectuated.

For the sake of authenticity, this paper will refer to the park by its original name, Nech Sar. For sake of brevity, Nech Sar National Park will be hereafter referred to as **NSNP**. The Mara Conservancy will hereafter be referred to as **MC**.

African Parks Foundation currently manages NSNP, and hereafter will be referred to as **APF.**

CONTEXT for MANAGEMENT PLAN

THE HORN OF AFRICA,
showing its arid regions in green
including the narrow slice of
Ethiopia's Rift Valley, site of NSNP.

Gil, Patricio Robles.
Hotspots Revisited. p. 277.

MAPS: *Ethiopian map-making seems to be in its infancy, as is its conservation knowledge. The lack of such defining imagery is disappointing. Maps that have been found are on pp iii,* 6 and 7.

NATIONAL CONTEXT

Ethiopia, although materially one of the poorest nations in the world, boasts an amazing heritage of cultural, historical and natural wealth. The natural beauty of Ethiopia's landscapes and wildlife amazes the first-time visitor. Yet Ethiopia suffers with the rest of the continent of Africa, which has lost almost 8% of its forest areas between 1990-2000 - compared to the global loss average for that decade of just over 2%. (Packer and MacDonald, "Business and Biodiversity," p. 25.)

ETHIOPIA'S GEOGRAPHY

Despite popular perception that Ethiopia is nothing but a desert, it is a land of rugged mountains (25 peaks are over 4000 meters high), broad savannas, lakes and rivers, offering some of Africa's most dramatic landscapes and most diverse faunas. Ethiopia's fertile highland plateau is the size of Britain, isolated from similar habitats by surrounding desert.

Known as "The Water Tower of Eastern Africa," these highlands support fauna and flora transitional to the Afro-tropical and Paleo-Arctic zones. The Great African Rift Valley diagonally slices through Ethiopia creating a region of volcanic lakes, full of a wide range of birdlife; dramatic escarpments offering far-reaching vistas; and varied elevations of ecosystems and wildlife habitats.

ETHIOPIA'S HUMAN POPULATION

The future of Ethiopia's endemic and endangered wildlife is tenuous due to exploding human populations. With a human fertility rate of eight children per female, Ethiopia's population per the last two censuses slowly grew from 39,480,954 in 1984 to 39,868,501 in 1994. Yet the current 2005 estimate is 78 million, with a population density of 133 people per square mile. Projections indicate that by 2015 the population will range from 104-115 million. Only 24% of the population has access to safe water; the average life expectancy is 43-45 years; and the adult literacy rate is 34%. Eighty-two percent of the population is below the poverty line. Fifteen percent of the country's roads are paved. (Lahmeyer, Jan.) Certainly given the population pressures on the land conservation efforts in protected areas must include incentives, such as job opportunities, to reduce pressure on remaining intact natural ecosystems.

ETHIOPIA'S FLORA AND FAUNA

Due to its distinct, isolated and diverse geographical formations, Ethiopia boasts a high level of endemism (a species unique to one particular area). More than 20 mammal species are restricted to Ethiopia, as are at least 6 reptiles, 33 amphibians and 30 birds species – the largest total of endemism in Africa. Ethiopia has the fifth largest number of floral species in tropical Africa. New species are continually being discovered, which reflects how little attention has been paid thus far to Ethiopia's biodiversity.

ETHIOPIA'S PROTECTED AREAS & CONSERVATION ISSUES

Conservation attempts to preserve Ethiopia's endemic species were begun during the reign of Haile Selassie (1930-1974), but were halted during Mengistu's regime (1974-92). Funding and

understaffing have been common deterrents to protection of Ethiopia's forest and wildlife reserves, many of which only have one administrative vehicle for use. Recent visitors to Lakes Abiata and Shala National Park south of Addis Ababa, report there are more livestock grazing in that park than wildlife; forests are being harvested in broad daylight; tent communities are pitched on the lakeshore; and maize, grown right there, is cooked in the natural hot springs. Due to intense need for space, human populations have crowded right up against and passed beyond the park boundaries, eliminating any possibility for much-needed buffer zones or migratory corridors. In the Horn of Africa, only 5% of tropical and subtropical grasslands, savannas, and shrub lands remain out of their original extent of 1,659,363 square kilometers. (Gil, Hotspots Revisited, page 32.) As a result, severe threats exist in many of the endemic populations, now crowded and concentrated into small areas. For instance, it would take just one outbreak of rabies to decimate the country's last viable breeding population of Ethiopia's endemic Simian wolves.

Ethiopia has fourteen dedicated major wildlife reserves needing management. Yet, the country is facing a political crisis stemming from the 2005 disputed election, and most likely a renewed border war between this land-locked country and Eritrea. With conservation in Ethiopia in its infancy, the greatest hope for survival of these protected areas and their economic, cultural, political, spiritual and scientific value rests on the twin foundations of private management and tourism support**.** Many would agree that in Ethiopia -- and in other countries facing similar dire humanitarian crises -- conservation and costs of managing the national, natural heritage must be internationally supported and independently funded.

NSNP SITE DESCRIPTION

NSNP's LOCATION

NSNP is 500 kilometers (310 miles) southwest of Addis Ababa in the Great Rift Valley at N 5°59'49.1", E 37°34'20.9". This wide fault in the earth's crust, stretching 8,000 kilometers from Turkey to the mouth of the Zambezi River in Mozambique, splits Ethiopia's Highlands into two major blocks**.** Since NSNP is located on the eastern escarpment, park elevations range from 1,100 to 1,650 meters above sea level, with significant variations in terrain and geology.

NSNP's BOUNDARIES

Lakes Abaya and Chamo form the northern boundary of NSNP. The northern part of Lake Chamo is included in the park, but Lake Abaya is not within the park. To the east lie the Amaro Hills (elevation: 1600 m.) and to the west is Arba Minch. This town's name, which means forty springs, is testimony to the extension of the ecosystems of NSNP into town. According to APF:

The red circle shows NSNP's location on a geological map

"The land boundaries of the Park have not been physically delineated, but have been mapped with reference to defined GPS points and do not, unfortunately, enclose an ecologically viable area. Recent observations have shown that the bulk of the zebra population, and possibly other species as well, move out of the Park during dry periods. The Southern Region government has agreed to redefine the boundaries and/or the area managed by African Parks Foundation to ensure the incorporation of the habitat used by the zebra population into the protected area. " (www.africanparksconservation.com/nechisar_involvement.html.)

NSNP's CLIMATE

The average annual rainfall in this semi-arid ecological zone, amounts to 570mm. The climate is known for long dry spells punctuated by unreliable and poor quality rains. In nearby Konso, 57% of the annual rainfall is concentrated in three months (March, April and May) and 62% of this is received in April. The park is dependent on scant rains to survive through the long droughts, except for the ground water forest, which has year-round water supply.

NSNP's UNIQUE NICHE AMONG NATIONAL PARKS

Among the most scenic, but least visited of Ethiopia's parks, NSNP's name is the Amharic phrase for the "white grass" found in plains in the east of the park. The park's beauty is defined by Lake Abaya to the north and Lake Chamo to the south. Chamo is the prettier of the two with its striking blue water contrasting against white sandy beaches, whereas Lake Abaya's water is brown from suspended ferrous hydroxide particles. The Sidamo Hills and Amaro Mountains to the south and east serve as a backdrop to these two lakes. They are separated by "The Bridge of Heaven" the blond grassy savannah above an escarpment wall. This saddle offers unique viewpoints over the two lakes. Below is a lush groundwater forest, to the sides are montane forests - all contained in a very small area and highly appreciated by naturalists, photographers, birders, Ethiopians, and world tourists.

Giant sycamore fig in NSNP Ground Water Forest ©Alison M. Jones

NSNP stands out from among most African protected areas due to its vast diversity of resources and ecosystems with a range of 542 meters in altitude found in a relatively small area of 514 sq kilometers (200 sq miles). It could be argued that a park with such diversity as NSNP is even more valuable today with the rapid climate change we are facing, because it provides more options of habitat if significant changes occur abruptly. The park's eco-systems range from riverine ground-water forest with giant fig and dry acacia forests to habitats for lion, hippo, zebras, the endemic and endangered Swayne's hartebeest [See Appendix 5] crocodiles, hartebeest, monkeys, hyenas and many other species. The park includes dry bush, hot springs and lakeshores fringed with papyrus reeds hiding Nile crocodiles up to eight meters long and hippos. Above the lake circle myriads of bird species

and under the waters swim tiger fish, giant Nile perch, barber, catfish and tilapia. Nearby are the Guge Mountains (4, 027miles) and Sidamo Hills.

The Rift Valley geological formations have endowed NSNP with vast water supplies full of rich resources. Lake Abaya, the largest in Ethiopia's Rift, is 2160 square kilometers and full of iron compounds. Lake Chamo, 550 square kilometers, has bigger crocodiles and more fish because Lake Abaya is over-fished by both local farmers and commercial companies that supply Addis Ababa. In addition the park boasts natural springs and the Kulfo River that feeds Lake Chamo. These waters are an essential supporting element of the major African Rift Valley migratory flyway.

Most of Ethiopia's protected areas are already lost to recent decades of incursions by human communities. Many of the country's water sources are depleted or gone, due to irrigation demands. NSNP is one of the few remaining parks for which there is hope. It is a park with intact forests and viable wildlife populations, worth the effort needed to save it. Fortunately, unlike other Ethiopian parks, NSNP is still salvageable.

NSNP's TOURISM POTENTIAL

Not only does NSNP have immense resources of species, beauty and variety to draw visitors, but it is relatively accessible. By car, NSNP is an eight-hour drive from Addis Ababa on one of the few decent roads in the country. There is also good air service from Addis on a sixty-seat Fokker jet that lands on a well-maintained runway at Arba Minch Airport. In Arba Minch there are a couple nice hotels. One has a panoramic view over the park, but is somewhat Spartan. The other has more comfort and style than most Ethiopian government-run hotels, by a long shot. Currently there are on average under 500 visitors to NSNP per month.

HISTORICAL PERSPECTIVE of NSNP as a PROTECTED AREA

To prevent further degradation of the biodiversity of NSNP, management must address the historical perspectives of conservation and especially community-based challenges.

Degradation or disappearance of protected areas usually occurs when there is a failure to clarify or address the following: land tenure and use, distribution of benefits and community empowerment. National and local politics, social implications, welfare of wildlife and livestock, implications of the park's limited size, and market and non-market values of NSNP's ecosystems must be assessed. With this broad background, one can more effectively structure a management plan to protect the park. Rehabilitation of the health and density of NSNP's species under a community-based management plan will bring in tourism revenue, justifying the park's existence to local stakeholders.

LESSONS from NSNP ANCIENT PAST

Foreign exploitation of Ethiopia's resources begun long ago have contributed to the current dire conditions of its people and ecosystems. Five thousand years ago, "The Horn of Africa was already a renowned biological hotspot…. The ancient Egyptians sent expeditions to the "Land of Punt" to bring back unique natural commodities such as frankincense and myrrh…. The ancient Greeks and Romans [later brought] these products…. to Europe by caravans along the incense route through the Arabian deserts." (Gil, Hotspots Revisited. p. 277.) For centuries adventurers and industrialists from other continents have plundered and pillaged Africa's resources. Managers of protected areas today must be careful to demonstrate that such colonial and patriarchal patterns will not be repeated.

NSNP: 1962 to 2005

When NSNP was gazetted in 1962 to establish a sanctuary for Swayne's hartebeest and Burchell's zebra, there was no disturbance to any human communities because this area was completely uninhabited. Ethiopia's population was one-third of what it is today. Then political turbulence following the civil war spurred nomadic pastoralists to escape into hiding in NSNP taking with them substantial numbers of livestock. These refugees continued to reside in the park until 2005, despite the lack of any social or governmental services. Due to a general compassion for the illegal settlers and a lack of legal directives, there has been little or no enforcement of rules against allowing cattle to graze, people to cut

trees, or families to build homes inside the park boundaries. In March 2000, there was a devastating fire in that required 5000 volunteer firefighters to save habitat for Swayne's hartebeest. Apparently Guji and Koira tribes caused the conflagration while illegally clearing bush land for cultivation. This example of increasing over-utilization is one of many that is causing degradation of park ecosystems.

Today the endemic Swayne's hartebeest, although once common and widely distributed, has dwindled to two viable populations whose last stronghold is solely within NSNP**.** Conversely, Ethiopia's population has increased from 25.5 million in 1962 when the park was gazetted to an estimated 78 million today. Now wildlife and humans compete for the land and resources of all of Ethiopia's protected areas. Almost 10,000 people moved into NSNP in the last twenty years The park's health is marginal today as are the living conditions of the local stakeholders.

THE PLIGHT of NSNP's STAKE HOLDERS/LANDOWNERS TODAY

There is ambiguity as to "access rights" and whether local people have the prerogative to live and collect timber in the park. There are 1500 Gugi (Oromic people from the northern region) continuing to live there in 2006 who, despite government decrees to leave the park, are contesting their rights (per Nick Lapham of APF). The determination of access rights is strictly between the local people and their government, and not under the domain of APF management. The government has offered the Gugi people, health and education systems upon relocation. These are services they don't have now, but are not yet of interest to the Gugi. Refugees International, reporting that approximately two thousand families have been compelled to move out of the park, has taken the side of the Gugi and thereby empowered and encouraged them to move back into NSNP. The status of these stakeholders is currently an unresolved issue. APF has informed the government that it is inappropriate to implement management plans until the people have been resettled outside park boundaries.

NSNP STATUS TODAY AS A NATIONAL PARK

Recent visitors have seen as many human residents as wildlife inhabitants in the park. Visitors in September 2005 witnessed rangers with machetes cutting down trees on the savanna because, according to the driver's query to the rangers, "The manager says to eliminate trees with thorns that will hurt the animals." The same visitors saw Oromitic Gugi, pastoralists who raise cattle, walking through the park to market (pastoralists who raise cattle); women bundling huge packs of wood for market; and local people fishing with traditional methods and materials from their boats made of local soft wood.

Red circle shows NSNP's location between two lakes on SAT image

These people, in claiming NSNP's land dedicated as wildlife habitat as theirs, are repeating a phenomenon that today is occurring throughout sub-Sahara Africa. Forests, important wildlife habitats, have long served as important refuges from the tyranny of war and resources for fuel wood. There have been no easy solutions to balance these conflicting demands, despite national and international governmental and NGO efforts. Humanitarians are surprised to find themselves arguing against naturalists, and vice versa. However NSNP's future, like the future of many other African parks, rests on such seemingly impossible resolutions.

After the November 2005 politically-motivated degazetting of Kenya's Amboseli NP, an editor wrote: "By international convention, true national parks have to fulfill a number of criteria and, once declared, host countries are obligated to provide them with the highest order of protection in perpetuity." (Africa Geographic, Dec. 05 – Jan. 06, p. 6. The Ethiopian

government, beset with many high-priority humanitarian demands, has at least tried to fulfill its conservation responsibility by contracting African Parks Foundation to privately manage NSNP for the next 20 years. This solution seems to be the best possible approach for the moment; and hopefully will lead to local Ethiopians being trained as management agents who will eventually control their land themselves.

Grant's gazelle gazing across NSNP's grassy savanna Photo ©Alison M. Jones

NSNP's MANAGEMENT ISSUES FACING APF

AFRICAN PARKS FOUNDATION

The Stichting African Parks Foundation [APF] is a not-for-profit foundation based in the Netherlands and chaired by Paul van Vlissingen. It currently manages five national parks in four African countries on behalf of their governments under long-term agreements. The Foundation's mission is to secure the future of Africa's most vulnerable protected areas through effective management and innovative financing, and to ensure that these global resources contribute directly to real economic development and the alleviation of poverty for local people. (http://www.africanparks-conservation.com/want_latestnews.html. Accessed December 23, 2005.)

APF MISSION AND POLICIES

According to the US Executive Director, Nicholas Lapham, APF "seeks to conserve African protected areas by assuming, at government invitation, long-term responsibility for their management and financing, while remaining committed to working transparently with partners to achieve practical, lasting and cost-effective results." APF-US envisions cooperation between universities, zoos, NGO's, foundations and other donors as the most efficient means to effect conservation that impoverished governments cannot do for themselves. APF policy is to sign long-term (twenty to thirty years) management contracts that give it full decision-making control and responsibility for managing all revenues and costs associated with a given protected area. The landscape and biological assets remain the property of the nation. Lapham states that APF "hires the best people it can find to manage field operations and encourages decisions to be taken at the level closest to the ground. APF seeks to generate employment and benefits for local people in order to balance a park's ecological needs with a community's development interests." APF believes that if key species are restored and wildlife rebounds, NSNP will realize the tourist potential its natural resources deserve.

As stated on its website, APF's goals in NSNP are: "The vision of African Parks Foundation is

to rehabilitate, develop and manage Nechisar National Park [sic] for the benefit of the people of Ethiopia in general and the communities around Arba Minch in particular. The ultimate objective is to transform Nechisar into a model park for Ethiopia with a viable base for tourism activities, contributing to the sustainability of the Park and attracting local support and enthusiasm for the conservation of Ethiopia's biodiversity." (http://www.africanparks-conservation.com/nechisar_involvement.html.)

INITIAL ISSUES in NSNP FACING APF

Initial assessment of NSNP reveals:

- Park infrastructure is in poor condition, e.g. the road network that is so limited in coverage.

- Cattle grazing on savanna grasses has increases the endangered status level of Swayne's hartebeest since they forage for the same grasses, and indirectly caused the introduction of invasive species

- Cattle browsing in the groundwater forest has removed the intermediate level of vegetation in the ground water forest.

- Firewood collection has caused erosion and flooding of NSNP ground water forest.

- Illegal fishing threatens Lake Chamo's crocodile populations, one of Africa's largest. Over-fishing, which has removed their food source, is likely the cause of a recent, steep decline in the numbers of juveniles. This decrease in fish also affects migratory bird populations.

Many elements have contributed to the park's recent decline:

- Poverty is rampant in this land of drought and famine. In Ethiopia, 82% of the population lives under the poverty line.

- Historically there has been a lack of awareness of conservancy need. Very little scientific data has been collected in Ethiopia, and what has been garnered is not readily available for research or reference. There is much data to be collected, studied and disseminated.

- The Park's diverse ecosystems demand diverse, yet coordinated approaches to the ecological and social conditions of each of its distinct ecosystems.

In February 2005, APF was granted management control by the government, which

simultaneously declared that all people residing in the park were to move out and would be appropriately compensated. According to APF's website, "these people lived in NSNP without schools, clinics and other essential services, and the Government is in the process of relocating them to suitable areas near the Park where basic services can be provided. The relocation has been negotiated by the Ethiopian Government, and is being undertaken with the consent of the people involved with the process preceded by lengthy investigations of the issue, originally funded by the European Union, planning of alternative settlement areas, consultations, negotiation and then implementation." (http://www.africanparks-conservation.com/nechisar_local.html)

APF has drawn a very clear line on this very sensitive issue, stating that only the government has sovereignty over decisions to move people out of the park and that APF is merely the park manager. **[See Appendix 1 – APF Management Guidelines.]** Citing UN guidelines, Refugees International has taken a stand against the Government's position on removing indigenous people who, only relatively recently, have settled in NSNP. There is substantial debate as to whether twenty-year settlers are considered indigenous to the park and whether the Ethiopian government has offered enough compensation to those removed from the park. As described in a December 2005 article in Orion Magazine, "In early 2004 a United Nations meeting was convened in New York for the ninth year in a row to push for passage of a resolution protecting the territorial and human rights of indigenous peoples. The UN draft declaration states: 'Indigenous peoples shall not be forcibly removed from their lands or territories. No relocation shall take place without the free and informed consent of the indigenous peoples concerned and after agreement on just and fair compensation and, where possible, with the option to return.'" (Dowie, "Conservation Refugees.") Resolution of this issue of whether the settlers in the park are indigenous, refuges, or entitled to certain rights is a governmental responsibility. However to help communities adjust to resettlement, APF is making unsolicited funds available that will dedicate $4,000 a month to instituting programs to help local communities.

APF's INITIAL ACTIONS in NSNP

Having been granted a contract to manage NSNP since February 2005, APF's goals and

objectives are currently being set. According to African Parks Foundation manager of NSNP Mateos Ersado, the following actions have already taken place:

- Illegal fishermen have been taken off the lake's water and given employment rebuilding park infrastructure.

- Local residents who formerly collected fuel wood from within the park have been hired by APF and under its guidance are removing invasive species of scrub acacia.

*Park rangers have received professional training, improved equipment and higher compensation so that now there is evidence of improved law enforcement and an enthusiasm among the rangers for what they are accomplishing.

- Mateos Ersado Malkato, a well-qualified Ethiopian with wide conservation and scientific experience has been appointed as Project Coordinator and the 35 current NSNP staff members will be seconded to APF with their equipment and infrastructure.

- Mateos Ersado has begun compensating those men and women removed from the park who previously made a living from cutting wood. The men have been allowed to continue collecting invasive acacia wood in the park for a limited period. They are currently being paid 8 birr (about $1) a day to hack out thorn thickets that have grown up in areas that were overgrazed by cattle. The women then collect and bundle that wood and sell it in town. In the future, APF is committed to finding alternative sources of fuel.

It is obvious that resource requirements for people in and around NSNP, if not successfully addressed, will conflict with sustainability of the park. Recently the ecoservices taken from NSNP have caused degradation to the point where the viability of its flora and fauna is marginal. The local people's recent, non-traditional, but significant, consumption of forest services, are responsible for degrading disturbances to habitats and species. Alternative sources must be established for local communities' needs for food, fodder, firewood and timber.

MARKET VALUES of NSNP

TOURISM

There is next to no tourism revenue now in NSNP, and very little in Ethiopian National Parks

in general. The little bit of tourism in Ethiopia is mainly focused on the historical Coptic Christian architecture in the north. Yet revenue in the last two years in neighboring Kenyan national parks has been very high. In the MC, specifically, tourism has offered record-breaking highs. Ironically Ethiopia's tourism numbers five decades ago were significantly higher than Kenya's. Thus, the potential exists for increased tourism numbers in Ethiopia. Currently Ethiopia is being frequently mentioned in travel articles as an adventurer's destination.

FISHING (unsustainable as currently practiced)

The protein revenue from fish has been a traditionally an important food resource for the local people. However it won't last if fishing practices don't become sustainable.

TIMBER HARVESTING and WATER COLLECTION (unsustainable as currently practiced)

Any further harvesting of ecosystem resources first must be studied to determine sustainable levels of yields. Then perhaps wood and water, which recently have been collected illegally and indiscriminately, could be collected in a carefully monitored process.

NSNP is endowed with high-elevation forest watersheds, lakes, a river and a groundwater forest. If deemed possible, NSNP management should provide local access to its water sources, offer distribution of water to local communities, or provide wells to supply clean fresh water. Financial benefits will accrue to communities as saved health costs and labor time.

Nearby villagers work at their well. Photo ©Alison M. Jones

NON-MARKET VALUES OF NSNP

Any analysis would assign high value aesthetic value to the park's diversity, beauty and open space for visitors. A subtle value of NSNP's resources is the enjoyment, imagination, feelings, aesthetics, ethics and spirit that stakeholders and visitors can experience. Biodiversity, known for its potential for wealth creation, enhances lives as well as livelihoods.

Although an intangible cost benefit, NSNP's contribution to global species diversity must be acknowledged as one of its greatest values. More and more frequently biodiversity is being acknowledged as beneficial to the general health of the planet in a myriad of ways.

> "The biodiversity of Earth is our biological wealth, our biological capital. The savings are every gene, every population, every species and every natural community that inhabits the oceans, the land, and the air… biodiversity is, as far as anyone knows, totally irreplaceable." -- Beattie & Erlich, 2001 (Packer and MacDonald, "Business and Biodiversity.")

Biodiversity controls soil dynamics, nutrient cycling, breakdown of wastes, crop pollination and regulation of populations through predators and natural competition for resources. Soil fertility, fire and flash-flood damage, droughts and availability of water for agriculture and other industries are all affected by biodiversity. Due to the unusual number of its endemic specie, NSNP is an important African site for study of biodiversity. Similarly, another of NSNP's premium, which cannot be accounted for in US dollars or Ethiopian birr, is its amazing variety of vegetative species found in such a small area.

THE MARA CONSERVANCY

COMPARISON OF THE MARA CONSERVANCY AND NSNP

The Mara Triangle, gazetted in the late 1940's, is the western third of Kenya's world-famous Maasai Mara National Reserve, the northern tip of the Serengeti-Mara ecosystem. While much more heavily tourist-ed, the Maasai Mara is like NSNP in that it also represents the jewel in the crown of its country's protected areas. The Mara Conservancy's last five years of management of The Mara Triangle's riverine forest, flora and fauna is suggested as a reference to anyone studying management of NSNP. The MC management plans objectives are directed to protect wildlife for global appreciation, preservation of biodiversity, and cooperation with the local communities, in this case the Trans Mara Maasai.

The MC began managing the Mara Triangle June 11, 2001 on the premise and local Maasai's understanding that its most tangible and significant yield is tourism revenue. The vision was that that the MC would insure that the Serengeti-Mara ecosystem's spectacle of the world's greatest large mammal migration could be maintained forever. The first public/private sector conservation partnership in Kenya, the MC has now fulfilled its first five-year contract as of October 2005, and has signed a new ten-year contract. Its primary objective was:

> To acquire and/or manage land that is of outstanding conservation value by virtue of its species of wild plants and animals, its landscapes or its ecological processes. [A concomitant objective was] to demonstrate that land managed under conservation can create significant economic returns through job creation and alleviation of poverty, and to educate the public accordingly." (Heath, "Mara Conservancy, Lessons Learned," p 2.)

The MC successes and struggles, which have been in area of management since acquisition of land was an unachievable goal, offer a glimpse at the potential for NCNP's success, management systems that might be applicable, and examples of possible problems that lie ahead. Despite some differences between the MC and NSNP, both parks are valuable to

scientists, photographers, wildlife lovers; and the great biodiversity found in both is under threat from encroaching populations needing fuel wood, timber, grass for grazing (fodder) and access to water. **[See Appendix Two: Mara Conservancy Management.]**

SIZE of PARKS

The boarders of the MC, known as "The Mara Triangle," are the Mara River slicing north to east, the 1000-foot-high Isuria Escarpment to the west and Tanzania on the south. This area, which measures 510 square kilometers, is just a bit smaller than NSNP's 514 square kilometers.

PRIVATE MANAGEMENT

The regional clans of Trans Mara Maasai, as represented by the Trans Mara County Council, own the land of the MC. Unlike NSNP it's not a national park, but instead a national reserve, dependent on Trans Mara County Council approvals and requests for percentage of revenue. NSNP is a National Park under the jurisdiction of the national government and the Southern Region government. Both parks are under private management by request of the landholders. who have recognized their inability to adequately institute or maintain management protection of their natural resources. Fortunately in both cases there have been private management options for them to turn to.

NATURAL and SOCIAL CALAMITIES

Both parks are subject to the often-devastating natural and political vagaries of Africa: droughts, floods, corruption, and sudden governmental changes. Currently Kenya is more politically and economically stable since its citizens subsisting on higher income levels, according to statistics.

DIVERSITY and DENSITY of FAUNAL SPECIES

Historically both parks have had a great diversity of wildlife and still have rich varieties of ecosystems that can support such diversity. Recently both parks have suffered loss of species.

MC has much higher numbers of animals today than the NSNP, especially when including the seasonal migration of 2 million wildebeest and zebra. Even without these migratory herds, the MC has greater populations of large mammal species, including elephant, giraffe, rhino which are no longer found in NSNP. These species flourish in the MC because of open access into protected dispersal areas. Management's current poaching control and institution of burn programs are also responsible for luring more herds of grazing species into the MC for richer food sources and safety.

MC has the adjacent dispersal areas include the protected areas of Tanzania's Serengeti NP on the south, Koiyaki Group Ranches Reserve on the north, and the Narok County Council's two thirds of the Maasai Mara on the east) for purposes of migration corridors and buffer zones. However NSNP's lack of dispersal areas, which enlarge habitats and allow seasonal migration, is a considerable barrier to NSNP restoring its full former diversity of fauna. As in most Ethiopian national parks, any visitor to NSNP can see that human habitation butts right up against NSNP boundaries, if indeed it doesn't spill right in. Officials from AFP have flown low over the surrounding park area in all directions and have declared there's no possibility of establishing animal corridors to other protected areas such as Omo or Mago National Parks to the south and west. The only migratory corridors are the avian flyways.

With its surrounding and vast dispersal regions, the MC can easily support a healthy elephant population. Brian Heath writes: "I would imagine that there has been a two- to three-fold increase in the number of elephant since the 1960's." The presence of elephants benefits other wildlife, as elephants create waterholes that serve other populations; but also means there is greater destruction of established trees and inhibition of growth of saplings. NSNP management must carefully consider the dangers of such a trade-off, even considering the revenue benefits of boasting elephants among its species. Yet despite lack of any migratory corridors for seasonal foraging needs (probably the reason elephants disappeared from NSNP decades ago), APF is seriously considering reintroduction of this species. While this action would please tourists, at the very least it would cause significant degradation of NSNP's fauna and at the very worst the health of the elephant population would be under extreme jeopardy in such a contained park.

As in any protected area, there are natural as well as human causes for wildlife species' cycles and fluctuations in numbers, both up and down. According to the MC's Chief Executive Brian Heath: "There has probably been a six-fold increase in the wildebeest population since the 60's. The theory is that the wildebeest population exploded as a result of vaccinating cattle against rindepest. Roan antelope are the obvious species that have disappeared. [Thus the roan antelope was chosen as the MC's logo, with hopes of a park so well managed that it could be reintroduced]. Wild dog have also dwindled as they are susceptible to the Maasai dogs' rabies and the rhino have been almost wiped out by professional poaching for their horns believed to act as aphrodisiacs in some cultures. Such species losses due to human poaching and contagious livestock diseases are being addressed and minimized by the effective management of the MC.

DIVERSITY and DENSITY of FLORAL SPECIES

In both parks wooded areas have existed for a long time, albeit they have been quite patchy in the MC for at least a century. The MC has riverine forests on the Mara River, an escarpment forest 1000 feet higher, swamps, and islands of thicket vegetation for which the Maasai Mara is named. ("Mara" in Maa means spotted). NSNP also has a riverine forest, escarpment forests, swamps and islands of scrub vegetation. As throughout Africa, both these parks have lost forested areas. Although deforestation has greatly slowed in the MC now due to strict surveillance by management, NSNP forests are still under threat as alternative sources to meet fuelwood needs are as of yet unresolved. The problems causing the MC's loss of wooded areas are different from than those being faced by NSNP. As reported by MC Chief Executive Brian Heath in December 2005:

> Undoubtedly there is less forest and woodland cover in the Mara over the last 100 years. There are anecdotal reports of much thicker woodland in the Triangle fifty years ago. Wherever you go, there are signs of large trees that have died and even since I have been there [five years], we have seen several kigelia trees [*Kigelia Africana,* commonly called Sausage Trees] that have died. Fire is undoubtedly the cause of most of the woodland destruction, but additionally elephant now keep the acacia woodland in check and stop much of the regeneration in other areas.

The MC has hired experts to research this situation. Per Brian Heath, "We have commissioned a study on the balanites, the characteristic acacia-type trees that are so common in order to see

why there is so little re-generation." The MC has official burn policies to provide fresh grass for its grazing species of zebra and wildebeest as well as the predators that follow them. Management has learned that a slow controlled burn will retard advance of invasive species, but if the burn is too hot it will retard regeneration of trees. Thus Maasai who traditionally have set hot burns to create more fodder for their cattle have been restricted to doing so only in a manner that fires will not enter the park. NSNP may have to consider benefits of controlled burns to replenish nutrients for its grazing wildlife species.

DEMANDS OF INCREASING HUMAN POPULATIONS

Both parks struggle with the social pressures of the needs of increasing populations on their boundaries. In 1995, scientists A.R. E., Sinclair and Peter Arcese wrote in their report entitled 'Serengeti in the Context of Worldwide Conservation Efforts:'

> The Serengeti-Mara ecosystem is one of the great natural wonders of the world. Yet since the early 1900's [it] has lost over 50% of its area. Serengeti-Mara ecosystem is fast becoming an insular assemblage of native species in a sea of humanity. As a result, the area is now severely threatened by the detrimental effects of human encroachment, the over exploitation and loss of its wildlife species, and the progressive loss of the natural system within its boundaries.'" (Scott, Mara–Serengeti, p. 180.)

TOURIST ATTRACTIONS

The MC has the added featured attraction of its annual, widely photographed and world-famous wildebeest migration; while NSNP has its endemic population of Swayne's hartebeest, large numbers of crocodiles and migratory birds, and its unusual ground water forest [See Appendices 3 and 5.]

The MC has a worldwide and long-established reputation among travelers, ensuring a fairly steady stream of tourism revenue. There were 300,000 visitors in the Mara per year as of 2000 – and are more now. Such annual numbers are not available yet for NSNP as the APF took over management mid- 2005, so they have not yet recorded a full year. However there are probably less than 5000 visitors per annum. This is 1/150th of the Maasai Mara tourists.

LESSONS LEARNED FROM THE MARA CONSERVANCY

The lessons from the MCs struggle to ensure the Mara Triangle's future as a wildlife preserve are important to note when structuring and promoting sustainable use of the land. It is as essential to realize natural change is inevitable as it is to recognize and honor current political motivations, societal choices and indigenous practices. As Anaxagoras said in the 6th century BC, we should never expect *stasis*, for both we change and the river changes.

Many of lessons learned by the MC in its first five years are worthy of consideration as new management plans are instituted for NSNP. The following have been excerpted from a list compiled by the MC Chief Executive:

1. It is important to make every effort possible to employ locals. Salaries must be paid regularly and on time.

2. Staff must be officially kept up-to-date on management policies and actions via daily briefing and planning meetings. Staff should have constant managerial mentoring and instruction regarding responsibilities, especially if new employees have never worked for a professional organization before. It is essential that staff understand a laid-down chain of command.

3. Attention must be paid to the potential dangers of working with community staff beholden to one or more area leaders, or "godfathers," and of relying on the word of a few that claim to represent an entire community.

4. Comprehensive, yet flexible, Terms of Reference must be set not only for the Board, the Executive Director , but also wardens, rangers and all other staff. These Terms should clearly state job responsibilities as approved by the management board.

5. The management organization needs to have absolute control over its share of revenue and be cleanly audited according to international accounting standards. "Facilitating fees," financial inducements to local leadership for support and bribes should be strongly discouraged. If local political pressures so dictate, a payment mechanism should be created to prevent compromising the integrity of the management organization and its credibility with donors. If such payments occur, they must be reported in all audits, despite any distastefulness of so doing.

6. Quarterly management meetings with affiliated camps, lodge and other related activities (such as balloon operations) should be held to report on management progress and to discuss park/reserve development and problems if any. This, along with distribution of the Chief Executive's monthly report, is an excellent way of informing managers and getting consensus on development and management issues.

7. Contingency plans must be considered for the disruption of downturns in tourism such as that which occurred after 9/11.

8. The management corporation should never become involved in distribution of funds to individuals or unofficial community groups. Any percentages of revenues owed to communities should be paid in a lump sum to a community- approved account.

9. It is crucial to the future of any park's existence today that local communities be involved. One such forum for that is to create a consortium of communities into a Community Conservation Trust comprised of a chairman, a couple representatives from each community, a secretary, and an employee representative from the park/reserve management company. This committee would meet regularly and handle all distributions of community funds, disbursing them in a transparent and nonpartisan manner. Payments should include coverage of school bursaries and medical bills.

10. It is essential to work closely with the national government so as to maintain official support for private park management policy.

Humans are not completely responsible for success of environmental management plans. Nature itself causes many changes within ecosystems' life spans and successive cycling. Jonathan Scott has observed this in the Mara Triangle after decades of photographically documenting that region:

> "Change is an integral part of ecosystems, and man's impact is just one of the factors causing it. The 1500 elephants moving back and forth between the Mara and the dispersal area to the north and east play a significant role in maintaining the area as grasslands – particularly inside the Reserve. As they move across the plains they unerringly hone in on the patchwork of tiny acacia seedlings, wrapping their prehensile trunks around the tasty morsels and deftly uprooting them with a nudge from one of their massive forefeet. Fires, too, play a major role in this gradual transformation from woodland to grasslands, inhibiting the regeneration of seedlings and sometimes killing mature trees. …The combined effect of livestock and resident wild animals, swelled each year by the arrival of the migration, keeps the grass short, limiting the amount of fuel for fires and thereby helping the thickets to flourish." (Scott, Mara–Serengeti, p. 182.)

After five tumultuous years, the greatest lesson from the MC is that private management can work. The MC's success validates APF's management role in NSNP. Likewise APF has been hailed as a viable model of environmental solutions in Africa's economically challenged countries. On October 13, 2005 a discussion in the British Parliament also applauded the role

of private management as displayed by APF:

> "Earl Peel today spoke about the activities of the Netherlands-based Stichting African Parks Foundation during a debate in the House of Lords on logging operations in the world's rainforests. He said, "Experience across the world…has shown that the most effective way to prevent damage, encroachment and unsustainable poaching is to ensure that the local communities obtain, through economic activity and trading, more than they would benefit from exploitation… Indeed, this is the ethos of a rather remarkable organization called the African Parks Foundation, which after only three years manages over 500,000 hectares of public national parks in four African countries. They are reversing extensive conservation and ecological damage by making these places the economic engines of local communities, and showing that transparent business and employment opportunities that stem from them are greater than from sound environmental management than from poaching and extraction and timber. This new approach to conservation is being used by a number of other organizations and even governments around the world with, I'm glad to say, much success." (AFP, Online: http://www.africanparks-conservation.com/want_latestnews.html, Accessed December 23, 2005.)

Perhaps most importantly, the MC (and all other successful management models) have shown that ongoing monitoring of planned actions meant to meet management goals and objectives are key to ascertaining whether such intended objectives are being accomplished. Furthermore, as put forth in the MC's original Policy Statement, results and lessons learned from the implementation of the MC's policies are to be publicized so that others working in wildlife conservation may monitor and assess impacts of this model.

BASIS FOR MANAGEMENT PLAN OBJECTIVES

SCOPE of MANAGEMENT PLAN

It is essential that a system be instituted to protect and enhance resources and opportunities offered by NSNP. Given the over-utilization and management neglect of the park until this year and lack of baseline inventory, the management plan for this park must start at the very beginning. Thus, it would be sensible for NSNP managers to work first with a relatively short-term management plan, as future decisions will be determined by yet-to-be-established baseline research.

Burchell's zebra on NCNP's Bridge to Heaven ©Alison M. Jones

Implementation of management's early goals may produce rather dramatic political reactions, as is happening currently *vis a vis* the government's expulsion of previous inhabitants of the park and banning local fishermen from the lakes. Radical or unexpected reactions will require flexibility in management actions and time lines in achieving desired objectives.

Thus a three-year term is recommended for this current management plan. The emphasis of this plan is less on specific recommendations and deadlines, and more on developing general conditions that will help in future planning of specific actions to protect and enhance natural and social features. The proposed plan is based on the scant analyses available of natural and social features, and thus it focuses on needing much more information on these natural and human factors. This plan should be adaptive to inventories and research produced within the early stages of the plan and lead to criteria by which a longer-term plan can then be established to follow this one. Similarly, the next plan should probably be for five years rather than ten.

NATURAL FEATURES ANALYSIS

The definition of Natural Features must begin with a compilation of species lists, preferably with the species' specific habitats indicated, i.e. ground water forest, highland acacia forest, savanna acacia forest, clear savanna, escarpment walls, African montane forest, lakeshores and hot springs. This proposed NSNP Management Plan is significantly hampered by the lack of qualifying data. Thus species lists in this document are unofficial, compiled by this author mostly from various tourists' online reports of what they saw, or think or vaguely remember they saw. Also referenced are guidebook descriptions of species to be seen in the park and tourism agencies' promotional species lists. In the lists below, there are notations of endemic and endangered, if known (* for endemic, ** for endangered).

MAMMAL AND REPTILE SPECIES: CURRENTLY/RECENTLY IN THE NSNP

Swayne's hartebeest is the most valued mammal in NSNP due to its endemism. Zebra and Grant's gazelle are the mammals most frequently spotted. Thirty-three other mammals and Nile crocodiles are listed in various online accounts and guidebooks as being in NSNP. Some of the data seems to undocumented hearsay.

The list below is compiled from online reports:

SPECIES	LATIN NOMENCLATURE	COMMENTS
Leopard		"maybe"
Lion	*Panthera leo*	spotted twice in '05
Cheetah		"rumored to be around"
Desert lynx		one citation: Gozalbez, p. 82)
Spotted hyena	*Crocuta crocuta*	
African Hunting Dog		reported online but APF says not
All 3 species African jackal		
Black-backed jackal	*Canis adustus*	
Hippopotamus		
Swayne's Hartebeest	*Alcelaphus buselaphus swaynei,*	2002's estimated population: 100
Grant's Gazelle	*Gazella granti*	
Burchell's zebra	*Hippotigris quagg*	
Greater Kudu	*Tragelaphus strepsiceros*	
Lesser Kudu		
Defassa Waterbuck		
Guenther's Dikdik,		
Thomson's Gazelle	*Gazella thomsoni*	
Bushbuck		
Klipspringer		
Grey Duiker		
Warthog		
Bushpig	*Potamochoerus porcus*	
Nile Crocodile		
Olive (aka Anubis) baboon	*Papio anubis*	
Guereza colobus	*Colobus guereza (abyssinicus)*	
Vervet (aka Grivet monkey)	*Cercopithecus aethiops*	
Caracal		
Bat-eared Fox		
Serval Cat		
Honey badger		
Gambian Sun Squirrel	*Heliosciurus gambianus*	
Lesser Galago	*Galago senegalensis*	
White-tailed Mongoose	*Ichneumia albicaud*	

Rhino and elephant haven't existed in park in over 100 years. But, according to Bartle Bull, "Recalling the days before increased population and cultivation finally stopped the free movement of game in the 1950's, … very few elephant populations were isolated, and elephants, in their thousands, would be led by weather and food, gathering often in the highlands of southern Ethiopia, then drifting south… (Safari: Chronicle of Adventure, p. 294)

Baboon in NSNP's ground-water forest ©Alison Jones

The following are mammal species that used to be in the park, that APF is considering reintroducing. There are many aspects to such actions to be considered first.

African elephant
Black rhinoceros
Giraffe
Eland
Lesser kudu
Gerenuk
Beisa oryx
Grevy's zebra
Cheetah
African wild dog
Cape buffalo

BIRD SPECIES

Ethiopia has more recorded bird species than any African country except South Africa. As of Fall 2004, over 350 species have been recorded in Ethiopia, and 188 species in Nech Sar alone. NSNP is reknowned for its large flocks of great white pelicans on Lake Chamo's Kulfo Peninsula. Acacia-nesting birds such as rollers, starlings and sparrow-weavers are well represented and there are many raptors. **[See Appendix 10, NSNP Bird Species]**

African Fish Eagle in Lake Chamo
©Alison M. Jones

A 1991 Cambridge expedition discovered a nightjar wing in NSNP that was different than any other known nightjar species. In 1995 it was named it the "Nech Sar Nightjar" (*Camprimulgus solala)*. However a live bird of this elusive and probably endemic species has yet to be sighted, and thus this species is not included in this document's species list. (Briggs, Ethiopia: A Bradt Travel Guide, p. 443.)

FISH SPECIES

While far from a complete list of species in the lakes and river, the following are commonly found in Lakes Chamo and Abaya:

Nile perch
Tiger fish
Tilapia
Barbel
Catfish

INSECT SPECIES

A 1991 Cambridge expedition discovered 15 endemic butterfly species and 8 endemic dragonfly species in NSNP.

Unknown species of butterfly in NSNP
© Alison M. Jones

TREE SPECIES

The trees listed below are those identifiable by a NSNP guide in September 2005. A much more complete species list of trees is needed.

Acacia polycantha (tallest species in ground water forest)
Giant Abyssinian acacia
Wild fig (*ficus sycamorus)* up to 30 meteres height in groundwater forest
Knotted acacia: in the savanna woodland now, which formerly was grasslands
Combretum: in the savannah woodland now, which formerly was grasslands

VEGETATIVE SPECIES

There needs to be much further investigation to create an inventory list of species in the following categories:

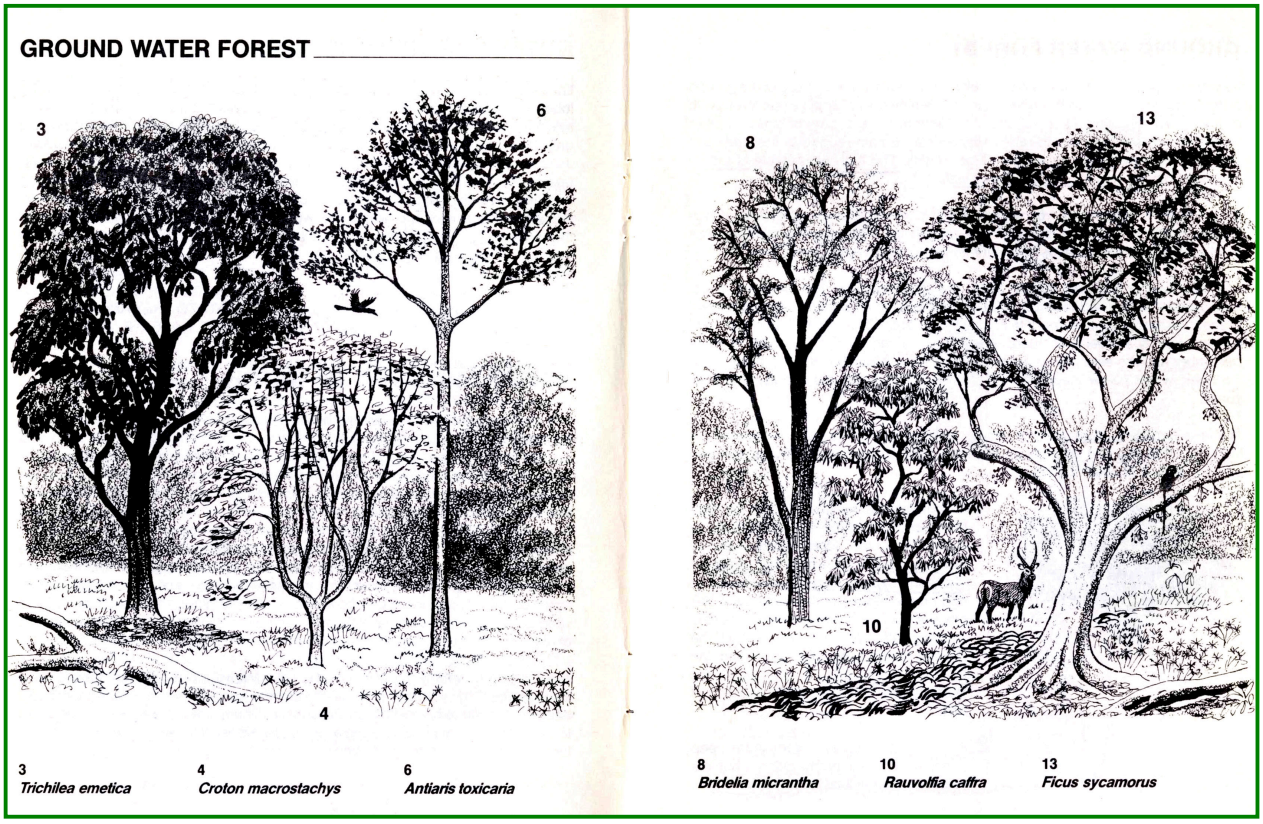
Herbaceous plants
Climbers
Epiphytes
Hemi-epiphytes (stranglers)
Saprophytes
Parasites
Fungi

ECOSYSTEM ASSESSMENTS

Sub-Sahara Africa hosts two biotic extremes that range from moist forests to dry open savannas. On most maps of central and eastern Africa these zones overlap. Elements of both biomes and many ecosystems exist within NSNP's distinct landforms. An ecosystem assessment would be the first step in management analysis of NSNP, noting the following for each ecosystem: its official classification, underlying geologic structure and composition, soil dynamics, nutrient cycling capability, soil-water, canopy, floral species density; class-size, percentage of tree cover. Such data would define the quality, quantity and general health of ecosystems and their species. However there is little available, accessible information. What exists in bits and pieces is often contradictory and confusing. Following this list below of NSNP's ecosystem types is a "best attempt" at an accurate portrayal of NSNP's ecosystems.

- Groundwater Forest
- Highland Acacia Forest
- Lowland Gallery Forest
- Knotted Acacia Savannah Scrub Forest
- Clear Savanna
- Escarpment Walls
- African Montane Forest
- Lake Shores
- Natural Hot Spring

Ground Water Forest in Lake Manyara, Tanzania



GROUND WATER FOREST

Surrounded by a series of natural springs, the NSNP ground water forest has a river running through it. Neither Internet research nor interviews with the U.S. President of APF can confirm whether this forest's springs are fed by seepage from volcanic rock in the rift wall as is the ground water forest in Tanzania's Lake Manyara, cited as most comparable to NSNP's groundwater forest. **[See Appendix Three Lake Manyara.]** The following two passages describe Lake Manyara's ground water forest:

> Riverine forests or thickets are seasonally extensive in all but the driest areas and were even more widespread for long periods in the past. They are also natural foci for the growth of forest as climatic conditions change…. (Jonathan Kingdon, East African Mammals, p 78.)

> The visually dominant tree in this forest is the tall wild fig (*ficus sycamorus).* The canopy is lush and vines hang throughout. Guereza monkeys (a.k.a. vervets), troops of olive baboons and a great diversity of bird species (the most noticeable of which is the silvery-cheeked hornbill) are found in the canopy, and bushbuck, bush pig and warthog on the ground below. There are other visiting species as well. "For many species of savanna ungulates, the lush vegetation around rivers and forest edges provides food and shelter during the dry season. (Jonathan Kingdon, East African Mammals, p 78.)

The greatest challenge for this ecosystem in NSNP is to prevent further illegal cutting of timber and underbrush or any further incursions of cattle, which browse on the ground water forest's intermediate height of vegetation. APF predicts that the sustainability of the ground water forest is recoverable if corrective measures are taken immediately; but if not, the forest is likely to collapse in the next decade. (www.africanparksconservation.com/nechisar_current.html.)

HIGHLAND ACACIA FOREST

Kingdon, East African Mammals, p. 33.

[No has been information found on the highland acacia forest yet.]

LOWLAND GALLERY FOREST

Kingdon, East African Mammals, p. 35

This forest known for its semi-open canopy is in the Sermelle Valley and bush land. Without specific knowledge of this forest, it is known that there are acacias dotting this ecosystem.

> Acacias are an interesting group of trees, growing on uplands, in swamps, along river courses and in semi-deserts. Most species are associated with special edaphic conditions or erratic seasonal rainfall. 'An *Acacia* cycle is only now being recognized and is as yet little understood, acacia formations (and similar types are probably cyclic in nature, rather than climax and successional.' (Vesey-FitzGerald, personal communication).'" (Kingdon, East African Mammals, p. 35.)

KNOTTED ACACIA SAVANNA SCRUB FOREST

Kingdon, East African Mammals, p. 35

Invasive acacias and combretum woodland are now covering what were open grasslands on the "Bridge of God" (or "Bridge to Heaven"). Cattle grazing and their hooves opening bare ground have facilitated the proliferation and regeneration of these invasives. Wildlife here is mainly greater kudu and Guenther's dik-dik, which thrive in scrub forest.

CLEAR SAVANNA

The Nech Sar Plains white-grass savanna is habitat for Swayne's hartebeest, zebra, Grant's gazelle, Kori bustards and others. It is the ecological heart of the park. It has dwindled in size due to soil disturbance by the hooves of cattle grazing, which has encouraged generation of invasive acacias.

Kingdon, East African Mammals, p. 39.

ESCARPMENT WALLS

The steep escarpments and ridges on the east and west of the park mark fault lines and volcanic extrusions associated with the formation of the Rift Valley. The damp, often dripping, walls are covered with green vegetation: including epiphytes, ferns and other classes of flora.

AFRICAN MONTANE FOREST

Kingdon, East African Mammals, p. 27.

To best define NSNP's montane forest, the detail below is based on a general description of Ethiopia's montane forests, since no specifics have been found for this report.

Formed by volcanic forces 75 million years ago, Africa's highland forests were covered with Eurasian tundra-like vegetation during the last Ice Ages. Today, remnant patches of natural vegetation consist mostly of podocarpus and juniper forests, with some acacias found at lower elevations. Cultivation, grazing and removal of firewood are all serious concerns within all montane forests in Ethiopia) **[See Appendix Four on African Montane Forests.]**

> NSNP is threatened by intensive natural resource use, fueled by the fast growth in the nearby town of Arba Minch. Previously one of the best protected areas in the country, the park is now exploited for livestock grazing and wood for construction and fuel." (Tilahun. 1996.)

LAKESHORES

The edges of the 551-square-kilometer surface waters of Chamo and the 1,160-square-kilometer surface waters of Abaya host populations of water birds (kingfishers, fish eagles, great white pelicans, storks, ibises, hornbills and cormorants), crocodiles, and hippopotamus – now all suffering loss of their food sources due to overfishing of Nile perch, tiger fish, tilapia, barbell and catfish in both lakes. South of Arba Minch on Lake Chamo's shores is the well known and misleadingly named "Crocodile Market" where dozens of massive crocodiles sun themselves. Tourists can view this unique concentration of large crocodiles by boat, while also watching the Guji fishermen ply the waters of Lake Abaya in high-prow *ambach* boats similar to those depicted on the tombs of the ancient Egyptian Pharaohs. Unaffected by overfishing of the lakes, waterbuck are also seen on the lakeshore. Narrow canals link the lakes in the rainy season and subterranean rivers link them in the dry season.

NSNP management only has jurisdiction over Lake Chamo and is now banning fishermen for the moment pending study of further sustainable fishing options. Those identified as illegal fishermen are being given jobs, such as building needed roads in the park. Populating the

shores and islands of Abaya and Chamo are farming peoples such as the Ganjule and the Guji, both of whom also have ancient traditions of hippo hunting.

NATURAL HOT SPRINGS

At the base of the cliff near the Bekele Mola Hotel, surrounded by volcanic scree and dense forest are bubbling geothermal springs. This location offers an excellent opportunity to explore NSNP habitat on foot, and offers swimming in a pool at the springs. The springs were closed to the public in 2001 and it is unknown to this author whether they have been reopened.

SOCIAL FEATURES ANALYSIS

CULTURAL DIVERSITY ISSUES

Over the last 15,000 years of the interglacial warming of the earth, which continues to date at an increasingly rapid rate, both pastoral nomads and shifting cultivators have effectively displaced the original hunter-food gatherers from Africa's Great Rift Valley. Next to arrive were European explorers and colonialists carrying the power of guns and horses, while some pockets of population remained in situ for 20,000 to even 40,000 years. Today the Rift Valley is home to what must be the greatest cultural diversity in Africa, if not in the world. Such cultural diversity cannot help but create tensions, especially as populations continue to increase at unprecedented rates and new satellite-based and easily accessible media make this a much smaller planet.

Analysis and solutions of those tensions are difficult, but must be pursued with evolving approaches. This certainly applies to conservation philosophies throughout Africa. Today many advocate revision of former practices of setting aside protected areas that exclude the indigenous local people. It seems to be much wiser now to consider the people now living in Rift Valley ecosystems prized by naturalists worldwide as an asset, rather than a liability.

RESETTLEMENT ISSUES

The Ethiopian Government is the arbiter of issues surrounding its official ban on human habitation in the park and moves to institute resettlement of people who have moved into the park relatively recently. Stating, "The issue of the remaining illegal settlers in the park is a governmental issue with which we are not involved," the Chairman of APF, Paul van Vlissingen, has made it clear that APF has not and will not be involved in political issues, including the resettlement of people. (APF, Online posting, April 27, 2005: http://www.africanparksconservation.com/nechisar_statement.html). For instance, APF currently manages Liuwa National Park in Zambia where 20,000 people live within park boundaries. APF defers to and respects governmental sovereignty in such decisions. APF interest is to provide humanitarian help to people in and around parks, and specifically in NSNP to the Guji's and Koira people.

The social situation APF currently faces is that "The Koira people (also spelled Kore), who are cultivators with ethnic links to the Southern Region, have been resettled at Abulo and Alfecho about 15km south of the Park where a full suite of community services and infrastructure not previously available to this community has been provided. The planned relocation of the Guji Oromo community, who are pastoralists with ethnic links to the Oromia region, has been planned and negotiated and is now also far advanced. The Guji have withdrawn their cattle from the Nech Sar plains, which had become badly overgrazed and eroded, to the eastern edge of the Park and are in the process of moving further east where they have been allocated land." (APF, http://www.africanparks-conservation.com/nechisar_local.html.)

SUSTAINABILITY OF RESOURCES

The shortage of food, fodder, firewood and timber in the communities around NSNP must be addressed to preserve the park. Annual food production by Ethiopian farmers is only enough for four to seven months' consumption. Unfavorable climatic conditions that have hurt the farming community's ability to feed itself include erratic rain, crop pests (including army worms and migratory birds) and human and animal diseases. Lack of firewood forces people to use cattle dung as a fuel which otherwise could have been used as fertilizer. Approximately 15-75% of fuel requirements are met by dung. However if there is not enough fodder, the

cattle die off and thus even the dung fuel supply is lost. Sale of illegal wood is one of the sources of cash earnings in Ethiopia, yielding more income than "Food for Work" programs. Thus forest guards, empathetic and often in the same predicament, traditionally have had little effect in restraining timber cutting; and NSNP staff often has also gathered fuel wood from within the park.

The contribution of trees to the household energy supply is essential in Ethiopia as most households rely heavily on fuel wood and charcoal from the forests to fulfill their energy requirement. Baking of *injera* pancake (their bread staple) accounts for more than 50% of all primary energy consumption in the country and over 75% of household energy needs. Thus, in poor rural communities charcoal and fuel wood trade is the major income source.

Trees are also used to build huts in rural communities throughout Ethiopia, supplying weight-bearing poles, sapling-size *withies* and roping to bind the two together into a framework that is then filled in with mud plaster walls. Additionally, "a wide range of items used at household level originate from forest trees: beds, brooms, *injera* pancake disc, cooking spoons, tool handles, mats, mortars, stools, trays, baskets, pillows, walking sticks and clubs. Normally, tool handles form the largest portion, followed by trays and baskets. Customs, beliefs, lifestyle and available materials tend to influence the use of these plant resources and the shape of the items, [including] the voluminous *Jimma* chairs made from a single trunk…. It was observed that items that demand more wood from the forests such as mortars, beds, stools or chairs have quite a long, useful life, suggesting that the pressure they exert on the forests is less than other uses, such as building materials." (Gomez, The Anthropology Museum Catalogue, p. 63.)

APF clearly recognizes the local peoples' reasons for firewood collection from the groundwater forest and over-fishing of Lake Chamo. "These activities are putting enormous and unsustainable pressure on the environment but they are complex, and interwoven with poverty, unemployment, over-population, and limited resources for socio-economic development. Our approach will be to tackle them in inclusive, consultative and innovative ways. Solutions are needed not only to remove pressure from Park resources, but also to create sustainable alternative resources for the local communities." (http://www.africanparks-conservation.com/nechisar_sustainable.html.)

Most African conservation programs face what can be intractable problems stemming from the extreme poverty and pressures from poor communities. As the Ethiopian countryside becomes densely populated, protected forests have become important resources for fuel wood and timber. This urgency causes concern for those managing ecological networks and protected areas as they realize they can't divert money from urgent poverty-alleviation efforts to put into biodiversity-protection measures. The solution would seem to be community-focused private management.

The conservation model that seems most appropriate to NSNP is one that focuses both on maintaining ecosystem functions in the long term and securing the sustainable use of the land. For the NSNP ecosystems to survive, there must be full participation of the diverse community sectors in deciding how to manage both the conservation and the sustainable development of this land. "Perhaps more than on any other continent, the support of local communities for landscape-scale conservation is a crucial issue in Africa, whereby the promise of sustainable livelihoods becomes the central challenge. ("Review of Experience with Ecological Networks, Corridors and Buffer Zones," p. 84)

Bundling branches of invasive acacias at NSNP Headquarters to sell in the market ©Alison M Jones

OVERVIEW of MANAGEMENT PLAN OBJECTIVES & ACTIONS to follow in next section of this document. Numbers (1, 2, 3) following the actions indicate timeline priorities.

ENVIRONMENTAL OBJECTIVES

TO CREATE AND PUBLISH A SCIENTIFIC BASELINE INVENTORY
Find researchers to begin the inventory and identify local assistants 1
Set a timeline and a system for compiling inventory 1

TO RESEARCH HABITAT CONDITIONS NEEDED for FLORA AND FAUNA
Investigate local and informal information sources 1
Find specialists for this research 2
Determine hiring guidelines 2

TO RESEARCH WATER RESOURCES, EROSION CONTROL & FLOOD REDUCTION
Repair deforested and eroded areas 1
Analyze each source of water 1

TO ESTABLISH CRITERIA AND PLANS FOR CREATING
A SUSTAINABLE HABITAT FOR PARK'S CURRENT FAUNA
Improve protection of ecosystems from cattle degradation and over-fishing- 1
Support fish populations in Lake Chamo needed as food for crocodiles 1
Research possibility of buffer zone acquisition 1
Protect wildlife from poaching 2
Study impact of re-introduction of wildlife species 2

TO ESTABLISH CRITERIA AND PLANS FOR CREATING
SUSTAINABLE HABITATS FOR PARK'S INDIGENOUS FLORA
Prevent further illegal grazing or harvesting 1
Remove invasive species 1
Study and institute most appropriate burn policy 2
Encourage regeneration of eroded areas 2

ECONOMIC OBJECTIVES

TO INCREASE TOURISM REVENUE
Determine sustainable levels of tourism and set goal for percentage of increase 1
Raise entry fee 1
Begin marketing tourism agencies and drivers 2
Meet monthly with local tourism providers 2

TO MARKET NSNP AS MOVIE SET AND FILMING LOCATION
Research means to do this 3

TO FIND DONOR SUPPORT
Tag NGO's and donors to be approached 3

TO INSTITUTE A CONSERVATION FEE
Study best means to do this and institute if deemed appropriate 3

COMMUNITY-BASED OBJECTIVES

TO ESTABLISH NSNP / COMMUNITY LIASONS
- *Employ a "Community Development Consultant"* *1*
- *Determine a percentage of revenue to be given to the communities* 1

TO PROVIDE ALTERNATE REVENUE STREAMS
- *Research forest-service payments* *1*
- *Provide fuel alleviation schemes* *1*
- *Research alternate harvest sources within NSNP* *2*
- *Encourage employment of nearby residents by affiliated tourism providers* *2*
- *Teach higher-yield farming techniques* *3*

TO PROVIDE ACCESS TO CLEAN FRESH WATER
- *Test all NSNP water sources* *1*
- *Research feasible methods of water delivery to communities* *2*

TO PROTECT COMMUNITIES CROPS AND LIVESTOCK
- *Monitor wildlife activity outside NSNP* *2*
- *Research fencing pro's and con's for installation and maintenance* *3*
- *Establish mitigation policy* *3*

TO INVOLVE COMMUNITY RESIDENTS IN NSNP MANAGEMENT AND PROFITS
- *Create employment opportunities within NSNP management* *1*
- *Offer ranger, guide and maintenance positions with training* *1*
- *Encourage new businesses that would focus on tourists' interests and needs* *3*
- *Encourage local residents to market their culture to tourists* *3*

ACCESS AND UTILIZATION OBJECTIVES

TO INCREASE VIEWING OPPORTUNITIES
- *Teach guides species identification and wildlife behavior patterns* *1*
- *Create view-sheds* *2*
- *Improve depth and breadth of roads and tracks into the park* *3*

TO ESTABLISH APPROPRIATE RECREATION ACTIVITIES
- *Consider active and passive enjoyment opportunities* *3*

TO ESTABLISH MORE AND IMPROVED CAMPING FACILITIES
- *Consider new tenting opportunities and improved facilities* *3*

TO DISSEMINATE INFORMATION ON NSNP TO THE PUBLIC
- *Create learning tools for use within the park* *3*
- *Disseminate information on NSNP worldwide* *3*

MANAGEMENT PLAN OBJECTIVES

The broad goal of a three-year management plan for NSNP should be the continued existence of the rich ecosystems, wildlife and forests of this small park. In ecological terms, the goal of this proposed management plan is to preserve NSNP's biological integrity. In practical terms, it means establishing aesthetic, educational rewards to visitors; economic viability and productive community relationships. To meet these multiple thrusts, the management objectives can be organized into four categories that focus on environmental, economic, community-based and access/utilization interests.

1. The **environmental** management objective is to contribute to preservation of global biodiversity, particularly its endemic and endangered species and its unusual ground water forest ecosystem.
2. The **economic** management objective is to increase park revenue to improve the livelihoods of local people and maintain the park.
3. The **community-based** management objective is to ensure support from local communities by providing incentives to maintain local and natural resources that can in turn provide income resources to those communities; and to prepare local leaders for eventual ownership control of their national park.
4. The **access/utilization** management objective is to maximize visitors' enjoyment of the park without impacting the stability of NSNP. This management goal addresses the interests of present and future naturalists, photographers, birders, Ethiopians and world tourists, local inhabitants near the park.

These objectives address what has been "mismanagement" of NSNP ecosystems. It is essential to identify the factors that have limited effective management; and to establish strategies and guidelines for sustainable management and utilization of NSNP. The current APF management of NSNP at this stage is a "complete work-in-progress," according to U.S. President of APF, Nicolas Lapham. Data available is insufficient to provide a sound basis for decision-making. Thus research is the primary and most immediate focus of this set of objectives.

Below are listed proposed management objectives with justification in green type. Following in black type are associated actions that will meet each objective.

ENVIRONMENTAL OBJECTIVES

OBJECTIVE: TO CREATE AND PUBLISH A SCIENTIFIC BASELINE INVENTORY

A baseline inventory of flora and fauna in NSNP's ecosystems is needed for research, reference and study for today and for the future. It will be a vehicle that will guide the establishment of objectives and better decisions for NSNP. It can be used to track changes as they occur. As baseline inventories include official counts of species listed, this research will be a valuable reference for other national parks and protected areas in the Great Rift Valley of Africa.

Using Management Units, based on ecosystem type, this inventory will be a record of NSNP resources, including:

- Lists of flora, to be categorized by Management Area (It would be interesting if the ground water forest inventory included a comparison to Lake Manyara's ground forest. **[See Appendix Four on Lake Manyara]**
- Lists of fauna to be categorized by Management Area, noting endemic and threat status, e.g. Swayne's hartebeest, which is both endemic and endangered. **[See Appendix Five: Swayne's Hartebeest.]** This inventory should also include special habitat features such as nesting grounds for birds or reptiles.

It is recommended that local people who live and work in the ecosystem be part of the collecting this information. The experience will create employment and add to their value awareness and their technical information about the park's natural resources. Such local participation will help spread the value of NSNP into communities adjacent to and surrounding the park, thus engendering more support for the management goals.

ACTION (Timeline Tier 1): Identify potential professional inventory specialists, preferably affiliated with universities known for their expertise, background and research support in ecology in Africa. Once chosen, they should be brought on site as quickly as possible to begin the inventory. Preliminary research should search for any previous inventories of the region.

All other decisions hinge on an up-to-date current inventory, should include species, density/population, regeneration and other criteria for healthy habitats. If feasible, local residents should assist in devising this inventory.

ACTION (Timeline Tier 1): Set a timeline for completion, hopefully within a year from arrival of specialists on site. Establish a systematic approach, probably by ecosystems, to compiling the inventory.

OBJECTIVE: TO RESEARCH HABITAT CONDITIONS NEEDED for NSNP SPECIES

The purpose of this objective is to ascertain what criteria must be met to conserve and maintain genetic all species and to protect soil and water. For instance, it is known that genetic variation allows species to adapt through natural selection to biological and environmental changes. Thus, when population size is low, especially when abnormally so, genetic diversity and capacity to adapt is reduced. Therefore park management must know the lowest level to which a population can go before it loses adaptability and thereby the means of adaptation and survival. This is especially significant as NSNP management determines which floral and faunal species to protect and which might be reintroduced.

Further topics to be studied are:

- Which are the dominant species, and whether they should be dominant.
- Which are the keystone species.
- Animal species' habitat criteria and natural rotation cycles – for present species and possibly previous species that might be restored in the future.
- Sustainability requirements for dominant, keystone, endemic, endangered, or other significant floral and faunal species in the park require for sustainability (i.e. size of population, density, etc.). It is the park managers' responsibility to promote the health of species and especially protect those that are endemic. "Ninety-nine percent of all species that ever lived are extinct. There have been five mass extinction periods since complex life evolved. We are now in the sixth extinction

spasm, which is largely driven by human activities." (Packer, Business and Biodiversity.)

- Dynamics such as nutrient cycling, carbon storage and sequestration
- Patterns of flooding, disease, droughts, ground water recharge cycles
- What would be an appropriate managed-burn regime, if any; and whether fires from prehistoric to recent times have had effects on the soil (i.e. whether naturally induced fires or to cooking fires).
- Throughout Africa the bush meat trade is the most significant cause of decline of species. Any such poaching in NSNP must monitored and handled carefully.

ACTION (Timeline Tier 1): Preliminary research should search out other resources ranging from casual hearsay to modern technologies: such as oral histories, indigenous knowledge, travelers accounts, good maps, aerial photographs, SAT images.

ACTION (Timeline Tier 2): Find appropriate professionals and specialists, probably university-based, to focus on all aspects quoted in this objective, covering dominant and keystone species, sustainability and criteria for habitats, and means to achieve and maintain healthy populations of species currently within NSNP. Research should note temperature, rainfall, sunlight, soil nutrients, wildlife food sources, reproductive rates/pollination, competition and many other factors, indicating the range of yearly variations to be anticipated. Yield studies can then be repeated every few years, following the same models. Studies should be made on whether re-introduction of species would cause too much additional stresses on the park, and whether that would really bring in more tourists. Perhaps larger populations of the species currently in the park would be a better alternative.

ACTION (Timeline Tier 2): Determine if researchers should be employed during or after baseline inventory compilation.

OBJECTIVE: TO RESEARCH WATER SOURCES, EROSION and FLOOD REDUCTION

This study would include determination of possible water usage and its distribution to local communities. Aspects to consider include:

- Are there headwaters in the mountains above NSNP (which are not within park boundaries)? If so how are they being treated?
- What is the sustainable limit on usage?
- What are the current purity or pollution levels of the water sources?

If the higher elevations within NSNP aren't protected, there will be degradation of all ecosystems and habitats, particularly levels of the water table in NSNP's ground water forest. Wetlands, lakes and rivers mitigate floods, yet destabilization of the Kulfo River's banks and unsustainable withdrawals of water from Lakes Abaya and Chalmo will prevent nature from protecting its own landforms. Increased water scarcity in dry seasons and flooding in wet seasons, exacerbated by climate change, threatens freshwater resources and both terrestrial and aquatic ecosystems. Freshwater depletion affects natural systems, community subsistence and agricultural needs.

ACTION (Timeline Tier 1): Repair deforested areas and the deeply eroded gullies that have developed from old cattle paths on the Nech Sar plains. These gullies will need extensive gabions and other urgent attention to stop them deepening and widening and to begin the process of rehabilitation. One of the biggest challenges in this regard is that the NSNP boundary does not go up to the top of the mountains, thus forest management control is limited.

The NSNP Rules Photo © Bonnie Muench

ACTION (Timeline Tier 2): Analyze functions and sustainable features of each source of water under the parameters as stated in the objective.

OBJECTIVE: TO ESTABLISH CRITERIA and PLANS for CREATING SUSTAINABLE HABITATS FOR FAUNA

It is expected that most faunal habitat implementation will be occur under the management plan that will follow this 3-year plan. However, during this current management plan, there will be some obvious implementation of first-tier actions. During this three-year plan the emphasis should be on insuring healthy populations of indigenous and current animal species. Using inventory and research studies, particular focus should be on the currently threatened populations of Swayne's hartebeest and crocodiles. In the second management plan one objective could then be used to research the impacts of other species that might be re-introduced: translocation costs, upkeep issues (possible fencing, etc), source of compensation to villagers if livestock is killed by predators and the effect on stable extant species in the park.

ACTION (Timeline Tier 1): To improve protection of park's ecological resources, cattle must be prevented from foraging for same grasses that are eaten by Swayne's hartebeest by removing cattle from park and preventing their reentry – with fencing if necessary. **[See Appendix Five: Swayne's Hartebeest]**

• ACTION (Timeline Tier 1) Prevention of the current overfishing in Lake Chamo that threatens populations of fish-eating birds and crocodiles, by enforcing the recent Government's recent regulations on fish resource management. Another potential threat is game hunting of crocodiles, although it is highly regulated with strict quotas, and so far not occurring within NSNP . **[See Appendix Seven– Crocodile Hunting.]** APW plans to initiated sustainable fishing-grounds development and control through community-based and cooperative law enforcement consistent with a recent Government proclamation, and recently launched a joint operation with local government targeting illegal fishing in the Lake Chamo area of the park. Teams of ten scouts are being deployed in two brigades, each equipped with a motorboat and responsible for undertaking day-to-day patrols.

1- BACKGROUND INFORMATION for THIS ACTION: Per APF: The nets currently being used are too fine- meshed and the average size and age of fish has declined in recent years. This depletion of the fish population threatens one of the most important crocodile populations in Africa, and certainly the largest in Ethiopia. Most fish are commercially, but illegally, sold to markets as far away as Addis Ababa. We

plan to develop a proposal together with the local legal fishermen's co-operatives, government authorities, the police and other concerned parties to solve this problem in a constructive way. This proposal will not only consist of regular controls, but also of incentives such as alternative employment. www.africanparks-conservation.com/nechisar_current.html.

Crocodile aestivating on shore of Lake Chamo ©Alison M. Jones

2 – MORE BACKGROUND INFORMATION for THIS ACTION: The most recent update on the fishing situation from APF's website: "A number of fishermen have now evacuated Nech Sar and ceased illegal fishing. On Wednesday 19 October, a number of these same fishermen protested in the nearby town of Arba Minch against these measures, threatening to resume illegal fishing within the park unless alternative employment opportunities were provided. African Parks (Ethiopia) is working hand-in-hand with the local government to calm the situation and identify viable and sustainable employment opportunities for the evacuated fishermen. As a first step, four fishermen's representatives met African Parks' management and local government officials on 20 October.

As a result of this meeting, the Gamo Gofa Zone Rural Development Main Department has undertaken to explore and survey sustainable fishing opportunities in both Lakes Chamo and Abaya and, if fish stocks allow, will organize the fishermen into formal cooperatives and small business groups which will be allocated alternative fishing sites. In the meantime, APF is offering short-term, temporary

employment as daily laborers to evacuated fishermen.

For its part, African Parks (Ethiopia) will provide financial support to relocate, equip with basic fishing gear and deploy the beneficiaries to alternative fishing sites outside area of Lake Chamo which falls within Nech Sar N. P.. In the longer term, possible opportunities for a community-based fish-farming project will be explored. http://www.africanparks-conservation.com/peopleparks_illegalfishing.html, Oct 23 05.

ACTION (Timeline Tier 1): To research desirability of acquisition of buffer zone to south. These would be transitional areas that would protect the park's resources while simultaneously offering local communities compatible land uses. In such buffer zones, appropriate economic activities would be permitted and sustainable resource management practices could be developed. If such double functions seem possible, AFW should begin negotiations with local communities immediately. **[See Appendix Six, Buffer Zones.]**

BACKGROUND INFORMATION for THIS ACTION: "The boundaries of the area under APF's' management must be redefined with the help of the Government and community support to ensure that the total seasonal range of the large mammal populations is protected." (http://www.africanparks-conservation.com/nechisar_future.html) Such a need has been underscored this fall by the migration this fall of Burchell's zebra leaving the park to enter the Koire community lands. Ultimately this southern boundary will have to be fenced, but hopefully it can contain a buffer zone for foraging for zebra and other wildlife when their preferred habitat is seasonally unable to provide fodder.

There are many social factors to be considered when approaching communities for acquisition of land to be set aside. The concept of a "buffer zone" began in the 1930's and offers a more easily accepted approach to providing habitat for wildlife than establishing larger networks or strict corridors. In a buffer zone, land use activities must be compatible with the protection of the core area. In a transition area, appropriate economic activities are permitted when they meet sustainable resource management criteria. However such designation raises many issues around interaction between human and species populations, and invariably imposes costs on the landowners and users, requiring considerations of compensation.

ACTION (Timeline Tier 2): To provide protection of wildlife from poachers: either for bush meat purposes, or trophy hunting (elephant ivory, lion's claw…). Community members must be taught policies and why they are instituted. As well consideration must be given to whether local residents who would be poachers should be rewarded for foregoing such actions. **[See Appendix Nine, Forest-Service Compensation.]**

ACTION (Timeline Tier 3): To very study carefully APF's objectives to re-introduce game animals that have become extinct during the past decades, such as lion, elephant, buffalo, Grevy's zebra, African wild dogs, cheetah, Beisa oryx, lesser kudu, gerenuk, eland and Rothschild's giraffe. This can only occur after inventory and eco-system research. To avoid human/animal conflicts NSNP would have to assume responsibility to protect the town of Arba Minch and settlements in the Amaro Hills on the east side of the park with modern fencing. http://www.africanparks-conservation.com/nechisar_current.html

Other terrestrial park boundaries may have to be fenced as well. Elephants don't just destroy crops, they can rip through a forest leaving only a few scattered roots. It is usually local residents who endure what is probably the heaviest impact of elephants on rural land in Africa. Yet employment can be created through elephant-watching tourism, as been so aptly demonstrated by various elephant-back safari operations throughout Africa.

BACKGROUND INFORMATION for THIS ACTION: With such re-introduction of large mammals such as elephant, buffalo and wild dogs and increases of lion, all of which can be very dangerous to humans, the current large volume of pedestrian traffic through the Park will have to be stopped. Alternative routes or modes of transport would need to be developed and facilitated.

There are specific issues to be addressed the possible re-introduction of rhino and elephant:

- The feasibility of returning elephants to such a small and contained park with no dispersal areas. Elephant usually need extensive migratory corridors – and can be very destructive of forests. Would the small size of the park be able to support a large enough population of elephants and rhino that they could become and healthy populations?
- The reintroduction of both rhino and elephants can invite trouble unless there are expenditures for heavy poaching controls, which costs money. Where would the funds come from to protect rhino horns and elephant tusks from the hi-tech weaponry of professional poachers?
- Additionally the cost of relocation is expensive, especially when it crossed national borders.
- Even the US President of APF admits there is no "wiggle room" if large mammals such as elephant are reintroduced. As he noted, there can be no people in the park and acquisition of a buffer zone on the southern boundary would be absolutely necessary.
- Introduction or increase of lion in NSNP needs to be studies, as Swayne's hartebeest are a favorite prey of lion.

OBJECTIVE: TO ESTABLISH CRITERIA AND PLANS FOR CREATING SUSTAINABLE HABITATS FOR PARK'S INDIGENOUS FLORA

Stopping deforestation and removing invasive flora are two crucial steps to be taken as quickly as possible. Particular focus should be on the park's savanna grassland being taken over by scrub acacia and its ground water forest, which has lost much of its low and intermediate level of vegetation. The deforestation in NSNP illegal is caused by the most basic community needs. The park is surrounded by agricultural development and increasing human settlements, which have been already cleared of trees, so it is natural that their inhabitants feel the need and a vague sense of entitlement to turn to NSNP for wood.

Most rural Ethiopian families use wood or charcoal for cooking, thus the demand for fuel wood is high and continues to increase. Much of the fuel wood in NSNP is that collected by inhabitants illegally living in the park. Another cause for cutting trees in the park is need for wood for small canoes needed to ply the lakes for fishing and ferrying. The loss of indigenous vegetation in the park is also caused by livestock needs. As the human population increases, so do the livestock populations. With less and less land available for grazing, local pastoralists are taking their cattle into NSNP for fodder.

Cattle and crocodiles in NSNP on Lake Chamo ©Alison M Jones

Once deforestation is halted, management should establish a policy of well-controlled burns can be beneficial to increasing the nutrient quality of fodder for grazing wildlife, especially as there are no dispersal areas for park wildlife. Burns are especially important in areas such as NSNP that have extended dry seasons. In 1991 a study done in NSNP found that protein percentage in the diet of zebra and hartebeest consuming dry grasses was less than 5%. Feces of NSNP's grazing ungulates in the dry season showed that the digestibility of dry matter in non-ruminants was minimal (zebra-40-45%, hartebeest - 50%, gazelle - 60%). The daily protein requirement was not met in zebra (392-704 g ind(-1) vs 134 g ind(-1) of intake) and in lactating gazelles (250 g ind(-1) vs 197 g ind(-1). (Abaturov, Web of Science notes.)

ACTION (Timeline Tier 1): To prevent human and livestock encroachment. The government has decreed it is illegal for local people to live in or use the park for collecting wood or providing fodder for its cattle. Given that stipulation, the park needs to protect its resources from illegal grazing or harvesting. The following actions are recommended:

- To educate local people on the law and the reasons why the park is not accessible for such needs to facilitate the desired behavior modification.
- To consider allotments or permits for traditional herbal gathering
- To use rangers and border patrols to enforce the law against human and livestock encroachment in the park. Warnings should be issued for the first few months for first offenders.
- To study the pro's and con's of fencing as a means to keep people from illegally entering the park. Fencing is expensive to install if it is high enough and strong enough to hold back people and animals desperate to cross for either food sources, water, mating or economic gain. Even more so, fencing is expensive to maintain. Where will maintenance funds come from? One hole in the fence negates all that was invested in its installation.
- To alleviate community need for wood, projects to be instituted include planting eucalyptus farms and providing fuel efficient stoves (This is addressed under actions for Community-Based Objectives)

ACTION (Timeline Tier 1): Remove invasive acacia scrub trees now growing in the soil disturbed by cattle grazing in the grassy plains. APF currently issues permits to local people to clear invasive woody species from NSNP, which can then be sold locally as fuel wood.

Employee of NSNP removing invasive acacias ©Alison M Jones

They previously entered the park illegally to cut trees. As well, removing today's acacia scrub releases the native grasses to regenerate and thus support grazing species populations such as Swayne's hartebeest. After all invasive acacias are removed, it will be necessary to monitor any re-growth of acacias, regeneration of grasses and consider reseeding if necessary.

ACTION (Timetable Tier 2): Burn policies in African parks with similar ecosystems, such as the MC, should be instituted as a means to thwart invasives as well as encourage more nutritive value in indigenous forage plants.

ACTION (Timetable Tier 2): To determine best means of regeneration of the parts of the park which have been badly eroded due to overgrazing by cattle. To be considered is whether soil repair is needed to provide receptivity to grasses regenerating, how to prevent re-growth of invasives, and what measures might encourage native species to become re-established. Issues include:

- Competition for resources
- Predation
- Habitat destruction
- Parasitism
- Hybridization with alien species

ECONOMIC OBJECTIVES

OBJECTIVE: TO INCREASE TOURISM REVENUE

After APF has managed the park for a full year of tourists' cycles. estimates can be calculated from a baseline number and projected with some reasonability. Tourism will validate the

worthiness of protecting NSNP by financially rewarding nearby communities. This revenue is also needed to fund park maintenance and improvement. Tourism publicity should be based on NSNP's unique scenic beauty, Swayne's hartebeest, greater kudu, one of the largest population densities of crocodiles in Africa and the park's unusual groundwater forest.

ACTION (Timetable Tier 1): A committee should be formed to determine what percentage of tourism revenue increase is desired. While a 10% increase of 3000 tourists per year still doesn't match the visitor numbers of the Mara Conservancy, 40% may not be desirable. Too many people might be detrimental to park systems.

ACTION (Timetable Tier 1): Market NSNP as a worthy tourist destination, increasing its appeal and recognition to tourists. According to Kenya's Tourism minister Morris Dzoro, "Parks must function as businesses that are market-driven and customer-focused, with service and infrastructures of the highest standard." ("Travel Africa." Autumn 2005, p. 25.)

- Establish PR on NSNP: i.e. "Put it on the map!" Ethiopia is so off-the-beaten-track that extra marketing effort is needed.
- Educate tour guides and agencies
- Get publication coverage in magazines,
- Develop web site
- Encourage documentary filmmakers to come,
- Request 3rd flight per week into Arba Minch

ACTION (Timetable Tier 2): Raise park entry fees, after comparing entry fees of other Ethiopian National Parks and Kenya's, and then trying to judge what the market will bear. In 2002 NSNP entry was 50 birr for 48 hours, i.e. $6 for 2 days

ACTION (Timetable Tier 2): Set a schedule whereby NSNP Park officials meet regularly (monthly?) with hotel staff and tour drivers to coordinate effective efforts to improve tourism.

OBJECTIVE: TO MARKET NSNP AS MOVIE SET AND FILMING LOCATION

Success with this objective would provide revenue from location fees that could support managament budgets. "Extra" actors' fees could support the local residents.

ACTION (Timetable Tier 3): Contact other African locales used for movie locations and explore their experiences as a first step in how to begin this outreach

OBJECTIVE: TO FIND DONOR SUPPORT

Efforts to pinpoint appropriate donors would most likely target international NGO's, but financial appeals should also be made to individuals and visiting tourists.

ACTION (Timetable Tier 3): Tag NGO's and donors for endowment money for NSNP, realizing that APF's contract is only for 20 years and that tourism may never completely support the park or the surrounding communities. NGO's to consider are not only those that focus on biodiversity, wildlife, natural resources, forests, but also those that sponsor rural business enterprises by training community entrepreneurs how to set up small sustainable business, thus alleviating stresses on natural resources.

Certain projects should be distinct funding requests, i.e. ask Foundation X to specifically fund a fence, Foundation Y to fund the Inventory project, and Foundation Z to fund restoration of the ground water forest.

OBJECTIVE: TO INSTITUTE A CONSERVATION FEE

This would be a nominal amount that could be added to hotels, lodges, and camping sites; or it could be added onto the entry fee.

ACTION (Timetable Tier 3): Determine whether the market could bear either an added fee to

costs of hotels, lodges and campsites catering to NSNP visitors; or to the park entry fee. Investigate other conservation fees, specifically in Kenya. If deemed appropriate, institute this fee when timely.

COMMUNITY-BASED OBJECTIVES

It is very important to establish systems that will provide coordination and communication between communities and NSNP management to build goodwill, enlist local political support, and instill a sense of pride and involvement in NSNP and thus eventually a strong commitment to NSNP's longevity. This kind of two-way dialogue and cooperation can prevent protests that would deflect international donor support and damage tourism appeal.

Local woman in NSNP ©Alison Jones

One immediate thrust of community-based objective is to facilitate assistance to those whom the government has removed from the park, and to assist in resettlement issues that relate to lack of eco-services that such people had relied up in the park. It is recommended that governmental policymakers and NSNP staff encourage full community participation and stewardship.

OBJECTIVE: TO ESTABLISH NSNP - COMMUNITY LIASONS

This should be accomplished through coordination and communications between NSNP Management and the most interested communities members available, hopefully those who are known to be influential within their villages.

ACTION (Timetable Tier 1): Employ at least one "Community Development Consultant" to be a liason to surrounding communities on a short-term basis, in order to engender popular support for preserving NSNP and learn communities' needs. Funding for this position could

come from APF, or perhaps another NGO that would like to sponsor this project. The actions assigned to this position would include:

- Identification of community leaders with whom to form an advisory committee that would report to the NSNP administration.
- Collection of baseline information on people, clans, problems, land holdings.
- Dissemination of information about NSNP: Educate community on value on NSNP and biodiversity, especially local children in school. Tools for this could include:
  + frequent presentations in local schools
  + newspaper articles, poster contests
  + lowered student park fees, free community days in park, field trips
- Identification of problems/concerns in the communities relevant to NSNP management
- Identification of potential community members to become trained as game scouts, rangers and other positions needed in management of NSNP.
- Investigate issues connected with sharing a percentage of NSNP tourism revenue with communities.

ACTION (Timetable Tier 1): Determine a percentage of monthly revenue to contribute to an official community account for their determination of the residents' most pressing issues: health clinics and schools, water projects such as wells, etc. The experience of the Mara Conservancy is that such direct payments cut down on "sticky fingers" not properly distributing such income to the community. Advertise and publish such monetary distributions so the entire community is aware of NSNP's value to the community.

OBJECTIVE: TO PROVIDE ALTERNATE REVENUE

Where local dependencies are disrupted in order to protect the resources and health of NSNP, compensation and, if necessary, new sources of income must be made available. This approach is already being applied to fishermen and those who formerly collected timber from NSNP forests.

ACTION (Timetable Tier 1): Research "forest-service payments," a new, growing global

resource that, in simple terms, pays local people to preserve their forests for the good of the planet. APF should investigate this resource. **[See Appendix 9 Forest-Service Payments.]**

ACTION (Timetable Tier 1): Assist communities in alleviating their fuel scarcity, finding ways to make up for lost opportunity to get wood from NSNP.

- Set up eucalyptus farms outside park: Per APF website : "With the government we are discussing the planting of quick-growing trees for fuel and building purposes in areas close to the town." (APF, www.africanparks-conservation.com/nechisar_current.html) It is important to first check to make sure not this does not create an environment that would encourage entry of other invasives.

- Provide fuel-efficient stoves to reduce the need for wood: Per APF website: "Together with the government and the people of Arba Minch, the university and other concerned people, we plan to develop alternative work for the wood cutters, alternative fuel access and 70% more efficient wood stoves. We will support local business interests to produce this stove for the APF proximate 10,000 households in Arba Minch at subsidized prices. With the government we are discussing the planting of trees for fuel and building purposes in areas close to the town." (www.africanparks-conservation.com/nechisar_current.html)

Gugi Fisherman in *ambach* canoe on Lake Chamo ©Alison M Jones

ACTION (Timetable Tier 2): Research and offer harvest opportunities of NSNP ecosystem services that are sustainable. Most of these would be non-timber forest products (NTFP), such as fruits, nuts, exudates, vegetative structures and other products leaving negligible impacts on the exploited species.

> "[Non-timber forest products] are labor intensive, require little capital and skills, are openly accessible for extraction and provide generally poor prospects for market and price growth. Unfortunately, this combination makes the majority of NTFP's economically inferior products, yielding low returns for those engaging in their production and trade. Paradoxically, the same characteristics that make them important and attractive to the poor (as an 'employment of last resort'), also limit the potential for increasing NTFP… and are not the "silver bullet some had hoped for." (CIFOR, "Exploring the Forest-Poverty Link.")

The other factor to study is whether such harvesting can be properly controlled so as not to become destructive or result in the gradual extinction of a species. There needs to be an established *threshold value* by which sustainability is measured, continual observance and/ or adjustment of needed adjustments and constant gathering of statistical information about the health of the exploited species. Physical impacts by collectors/hunters such as trampling of flora or sounding of fauna may need to be addressed.

With the above *caveat* in mind, the following could be possible considerations

- collection of dead trees.
- beekeeping to yield honey and bee's wax **[See Appendix Eight on Apiculture]**
- grass cuttings for basket making, brooms, and thatching. This would encourage fresh shoots of grass, which attract hartebeest
- reed and vine collection from lakes and ground water forest for rattan and weaving
- tree sap or oil collection for herbal medicines or ointments

ACTION (Timetable Tier 2): Encourage tourism services to employ more local people.

ACTION (Timetable Tier 2): Help address ways for locals to become more successful farmers, by teaching them how to prevent land and soil degradation to the point it can't support livestock or agriculture. Provide training on how to significantly increase crop yields and reduce frequency of crop failures. Such training, done either by APF or another more development-oriented NGO, should include warnings on the consequences of over-appropriation of water for irrigation, which can lead to shortages and salinization. Farmers should become aware of the potential for irreversible degradation of resources with installment of dams, creation of irrigation channels and flow diversion, wetland drainage and excessive groundwater withdrawal.

BACKGROUND INFORMATION for THIS ACTION: According to Farm Africa, "Fertilizer use in Ethiopia is low compared to many other developing countries due to cost, lack of credit, poor availability and the risk of crop failure. However, farmers use locally available materials and indigenous practices to maintain or improve soil fertility. These are applied in different ways to the various types of land and include: manuring, hoe cultivation, crop residue utilization, use of leaf litter, composting, fallowing and soil conservation.

Manure is one of the most important factors in ensuring consistent yields. However, nutrient balance trials show that in some cases manure could be used more effectively (especially in the lowlands) by

applying a greater proportion to outlying fields, rather than over-manuring fields located near to the homestead. (Farm Africa online: http://www.farmafrica.org.uk/documents/72.PDF, page 1.)

OBJECTIVE: TO PROVIDE ACCESS TO CLEAN FRESH WATER

Water is a necessary resource for all communities: fresh water resources are fundamental to human survival, both directly as a vital consumption need, and indirectly as necessary irrigation of crops. If settlements near and adjacent to NSNP are denied access to clean water found within the park, the future of the park as a protected area will be in jeopardy. Provision of water for consumption by local residents is one of the most important actions to be undertaken by NSNP management. Ethiopia's continuing population growth is creating increasing demands for water provision that require integrated management across public and private sectors.

Water jugs at village well © Alison Jones

ACTION (Timetable Tier 1): Test surface water sources from NSNP's springs, two lakes and river for chemical and organic contamination and assess flow implications. Consult already-completed studies on local fresh water resources exist. Preliminary research yields the following information:

Water Resources Potential and Quality Assessment of Abaye-Chamo Basin, 1985, a project undertaken by AWTI/ Ato Seleshi Bekele to determine the water resources potential and sustainability with respect to quality, and their environmentally sound and sustainable development strategies for the water shed area of Abaya and Chamo lakes, together with their tributary rivers.

- A Holistic Approach to Improve the Environment in the Land Water Ecotene of Lake Chamo and Nech Sar National Park, 1991 (7th cycle), a project undertaken by AWTI/Ato Habte Jebessa to analyze the bottom-up effect in the Lake Chamo System and to analyze the top-down factors from fishing aspect. (For further info: contact Ato Abebe Mekuria, Head, Mines, Energy and Water Department, P.O. Box: 2490, ESTC, Addis Ababa, Ethiopia – or Dept of Mines, Energy and Water online: http://www.telecom.net.et/~estc/departments/water.htm)

ACTION (Timetable Tier 2): Research means, feasibility and costs of creating sustainable supplies of water delivered from the park to the communities, based on a needs assessment

and resource availability. To be considered:

- digging wells
- installing pipelines to carry water out of NSNP to nearby villages and homes.
- any other means of delivery of fresh water to nearby communities

OBJECTIVE: TO PROTECT COMMUNITIES' CROPS AND LIVESTOCK

Wildlife species throughout Africa face decreasing population numbers and often endangered status due to their encroachment into communities, predators' killing of livestock and large mammals trampling farmland, thereby devastating needed crops. It is essential for the survival of NSNP wildlife that surrounding communities be protected from potential wildlife destruction, and quickly compensated if any such losses occur.

ACTION (Timetable Tier 2): Monitor any effects of wildlife activities on nearby communities.

ACTION (Timetable Tier 3): Research fencing as protection against wildlife encroachment.

ACTION (Timetable Tier 3): Establish policy of mitigation if there is livestock predation, crop raiding or other destruction by wildlife.

OBJECTIVE: TO INVOLVE LOCAL RESIDENTS in NSNP MANAGEMENT / PROFITS

There are many examples in Kenya and other African safari countries of successful community conservation programs. The NSNP management should involve as many community members as possible in its actions and eventually in decision-making processes, even if this only occurs in a buffer zone. While NSNP is dependent on donor funding, community goodwill will lead to participation and thus permanence of protection of NSNP's resources. Various revenue-generating programs can be instituted with profits going back into programs and into community projects such as school bursaries. One of the benefits of such programs is that the local people, who previously may have lived as subsistence cattle herdsmen or destitute families dependant on famine relief, can gain a belief that they do control their own

destinies. They can become entirely responsible for running a Community Trust, and elect community trustees directly at public meetings at each of their settlements.

ACTION (Timetable Tier 1) : Assist in providing new employment and income opportunities within the NSNP management framework. . Support should always be available for more traditional livelihoods should be provided, such as the above actions, which would assist traditional farmers and guidance on sustainable fishing It is important however to maintain sensitivities to the communities' reactions to switching their occupations. These opportunities should be offered, but not forced. Per the Mara Conservancy Management Objectives:

> The local residents… have long resented the fact that while they are employed in relatively menial roles within the lodges, they have little access to the more high paying jobs. The Conservancy recognizes this as a serious problem, but does not want to move into a position of trying to enforce positive discrimination. Instead it will keep this issue on the agenda in its discussions with lodges and tour operators. It is planned to establish a fund to provide scholarships for locals to attend tourism-training institutions. (MC Management Framework, p 84.)

BACKGROUND INFORMATION for THIS ACTION That this is a touchy issue is documented by a Maasai chief's statement: "In the long term ideal we are looking at the virtual autonomy of land-owners to do what they wish with the wild animals that live on their land, including the ownership of those animals and the right to 'farm' them, and to generate income from them through tourists, researchers, zoos, butchers, leather merchants or trophy hunters or all combined. *But not yet.* First we must ensure the right balance between freedom to exploit wildlife and the responsibility to preserve it. To do that we need a communications system to build awareness and understanding; to let the individual understand the part he can and must play in the global conservation and to let the conservation establishment understand how the [community members] can and must benefit." (Bennett, Wildlife - When It Pays It Stays, p 4).

Given the above considerations, the following options can be offered for consideration:

ACTION (Timetable Tier 1): Make NSNP positions and training available to local people as rangers, guides, maintenance crews for removing invasives and repairing roads, and administrators with goal to bring them up to management levels. In Kenya the Mara Conservancy has an entirely Maasai legion of rangers carrying AK47's and doing an impressive job of poaching control. Also in Kenya, sponsored by Lewa Downs Ranch owners have funded the startup of two luxury guest lodges (Il N'gwesi and Tassia) managed entirely by the Ndorobo people.

ACTION (Timetable Tier 3): Encourage establishment of new businesses associated with tourism. Micro-loans can be arranged for hotels, restaurants, stores or kiosks to sell local crafts. As well, NCSP should encourage nearby hotels, restaurants and other tourist service organizations to hire local people, and nearby tourism-oriented stores to sell local crafts.

A cluster of bee hives outside NSNP ©Alison M. Jones

ACTION (Timetable Tier 3): Encourage and train locals to share their culture with tourists for profit. For instance in northern Kenya, a tourist lodge called Sarara (aka Namanyak) offers its guests the opportunity to witness – without cameras – the traditional Samburu practice of bringing their cattle to wells dug into dry river banks where the men, unclothed, pass buckets up a series of "shelves" in the wells, singing to their cattle by name. The Samburu receive a stipend for this and are simultaneously allowed to continue their traditional lives. Here in NSNP it could be the bee-keeping traditions where cylindrical logs are treated to attract bees and then bees are smoked out so honey may be accessed.

ACCESS AND UTILIZATION OBJECTIVES

An integral responsibility of stewardship of a national park is to enhance aesthetic, spiritual, educational and recreational enjoyment for all people. (This will also increase tourism.)

OBJECTIVE: TO INCREASE VIEWING OPPORTUNITIES

Touring opportunities should be enhanced so visitors can more fully appreciate the contrast and diversity of NSNP ecosystems. Focus should be on permitting deeper and more thorough access into the Park.

ACTION (Timetable Tier 1): Train guides to know and to communicate all species identification and wildlife behavior patterns to visitors. Train rangers in patrol techniques.

NSNP savanna track, 2005 ©Alison M Jones

ACTION (Timetable Tier 2): Create view-sheds. One of the best places is from the open Nech Sar Plain, but also to be considered are the escarpment walls, mountain panoramas and lakeshores. Viewing blinds should be considered, particularly for photographers and birders

ACTION (Timetable Tier 2): Improve the road and track system with in the park to create an interesting connectivity of trails, roads, ecosystems, habitats and view-sheds. Steps to a better road and track system:

- Maintain existing roads in good condition, especially those on steep inclines with significant and dangerous drops off the side.
- Determine cost efficiency of renting grading equipment versus buying it.
- Build new tracks. A map should be drawn showing the existing track network and used as a basis for producing a plan for road improvements.
- New suggested routes should be surveyed, and assigned an estimate of the amount of surface material needed and costs involved.

OBJECTIVE: TO ESTABLISH APPROPRIATE RECREATION ACTIVITIES

Both active and passive visitor experiences should be considered under the over-riding guideline that they must not disrupt wildlife, habitats, or other visitors' experiences.

ACTION (Timetable Tier 3): Consider riding, boating, walking, night drives with infrared

lights, bush picnics and sundowner sites. For each activity, study what would be the most appropriate locations for that activity, level of usage that can be sustained given expected impact on flora and fauna, and any other conflicts that can be anticipated.

OBJECTIVE: TO ESTABLISH MORE AND IMPROVED CAMPING FACILITIES

Installation of additional visitor facilities must be designed in such manner that they won't interfere with wildlife or destroy habitats, vegetation or view-sheds. Currently there are only two little-used campsites about five kilometers from park headquarters on the forested banks of the Kulfo River. There are no accompanying amenities, but the sites are quiet and offer a great wildlife viewing, especially of crocodiles in the river. As of 2002 rules, self-sufficient campers with their own supplies were allowed to camp elsewhere in the park.

ACTION (Timetable Tier 3): Request and decide on bids for permanent tented camp within the park, fly-tent sites, and long-drop toilets, water taps and rubbish bins throughout the park.

OBJECTIVE: TO DISSEMINATE NOTICE OF NSNP RESOURCES TO THE PUBLIC

Much more information on NSNP resources is needed within the park for visitors. As well more information is needed on the Internet and in guidebooks for potential tourists. A positive result of the creation of thorough species lists and ecosystem assessments of NSNP and other research proposed in this management is that there will be a much more scholarly reservoir of information for global reference and scientific scholarship.

ACTION (Timetable Tier 3): Within the park, develop interactive, educational events and programs; good signage, brochures, maps, and guidebooks; well-trained and educated wildlife guides/rangers.

ACTION (Timetable Tier 3): For worldwide access to information on NSNP establish an Internet presence and opportunities for interns, scientists and monitoring agencies to observe NSNP flora and fauna.

TIMELINE FOR MANAGEMENT ACTIONS

TIER 1 / IMMEDIATE

ENVIRONMENTAL ACTIONS

Find researchers to begin the inventory and identify local assistants
Set a timeline and a system for compiling inventory
Investigate local and informal information sources
Repair deforested and eroded areas
Analyze each source of water
Improve protection of ecosystems from cattle degradation and over-fishing
Support fish populations in Lake Chamo needed as food for crocodiles
Research possibility of buffer zone acquisition
Prevent further illegal grazing or harvesting
Remove invasive species

ECONOMIC ACTIONS

Determine sustainable levels of tourism and set goal for percentage of increase
Raise entry fee

COMMUNITY-BASED ACTIONS

Employ a "Community Development Consultant"
Determine a percentage of revenue to be given to the communities
Research forest-service payments
Provide fuel alleviation schemes
Test all NSNP water sources
Create employment opportunities within NSNP management
Offer ranger, guide and maintenance positions with training

ACCESS/UTILIZATION ACTIONS

Teach guides species identification and wildlife behavior patterns

TIER 2 / A BIT LATER

ENVIRONMENTAL ACTIONS

Find specialists for this research
Determine hiring guidelines
Protect wildlife from poaching
Study impact of re-introduction of wildlife species
Study and institute most appropriate burn policy
Encourage regeneration of eroded areas

ECONOMIC ACTIONS

Begin marketing tourism agencies and drivers
Meet monthly with local tourism provider

COMMUNITY-BASED ACTIONS

Research alternate harvest sources within NSNP
Encourage employment of nearby residents by affiliated tourism provider

ACCESS/UTILIZATION ACTIONS

Create viewshed

LATER / TIER 3 (i.e. perhaps one to two years from now, when tourism picks up)

ECONOMIC ACTIONS

Research means to interest filmmakers in NSNP
Tag NGO's and donors to be approached

COMMUNITY-BASED ACTIONS

Teach higher-yield farming techniques
Research fencing pro's and con's for installation and maintenance
Establish mitigation policy fro property
Encourage new businesses that would focus on tourists' interests and needs
Encourage local residents to market their culture to tourists

ACCESS/UTILIZATION ACTIONS

Improve depth and breadth of roads and tracks into the park
Consider active and passive enjoyment opportunities
Consider new tenting opportunities and improved facilities
Create learning tools for use within the park
Disseminate information on NSNP worldwide

PERFORMANCE STANDARDS

THE NEED TO DEVELOP SEVERAL MULTI-PRONGED PERFORMANCE STANDARDS

There are many pitfalls to successful implementation of even the most well-intended environmental management plans. The Millennium Project Task Force on Environmental Sustainability lists eight obstacles to ameliorating environmental degradation:

1. Lack of clear operational objectives.
2. Insufficient direct investment in environmental management.
3. Poor nitration into sector policies
4. Inadequate institutional capacity, misalignment of goals, and poor governance
5. Widespread market failures and distortions
6. Underinvestment in science and technology
7. Difficulties of regional and international cooperation
8. Limited public awareness

(Melnick, McNeely, Navarro, Schmidt-Traub, Sears. Summary Version, p. 13.)

The first factor listed speaks to the importance of monitoring performance. There must be a means by which to determine whether an action is succeeding in meeting its objective. If a strategy is not being effectively implemented, it is useless. Thus it is essential to devise "yardsticks" by which to measure whether established Management Plan Objectives are being met. These yardsticks must provide tangible, measurable standards. It is preferable that each Performance Standard should address several objectives.

A fictional example of such a standard could be that 75% coverage of native grasses is a marker that the following desirable objectives have been successfully addressed:

1. Establishment of good habitat for Swayne's hartebeest,
2. Evidence of proper habitat for reintroduction of rhino,
3. Eradication of invasive scrub acacia
4. Erosion prevention

MANAGEMENT BUDGET

INITIAL COSTS TO BE DETERMINED

As this is NSNP's first year of management, amounts are impossible to estimate at this time. Below is a list of some of the major expenditures to be considered.

- An inventory to be made of species, created by paid professionals
- Research and feasibility studies (assessments of health and sustainability of populations, possible forest service payments, water quality, search for earlier studies, translocation of species that might be re-introduced, fencing, burn policies, eco-harvest opportunities
- Reimbursement stipends to people moved out of park
- Salaries and training of warden, rangers for poaching control, habitat management and tourist guiding, maintenance crews, and community development liaison
- Fuel alleviation to local stakeholders
- Uniforms and equipment such as radios, binoculars, guns
- Administrative costs; road building and repairs; maintenance of staff buildings, establishment of view-sheds and new viewing tracks, new camping sites/lodge
- Structure of revenue collection and its concomitant cost
- Financial support of education and health in local communities
- Procurement of buffer zone along southern boundary
- Public Relations and tourist services, such as brochures, maps, activities, facilities
- Fundraising
- Treatment of injured animals as result of human interference (snaring, poaching)

REVENUE

As this is the first year of NSNP management, amounts are impossible to estimate at this time.

An interesting revenue assessment has come from APF:

> We believe that the long-term financing of protected areas will come from a combination of four principal sources:
>
> • Commercial activity centered on tourism and the sustainable use of natural resources in surrounding areas and occasionally in the parks themselves
>
> • Support from specialist conservation and sustainable development organizations and research bodies in providing a cost-effective and conducive environment for them to achieve objectives we share.
>
> • Donations to endowments and operating costs for individual protected areas from the individual, public and private sectors
>
> • The long-term provision of credits for global benefit products originating in the protected areas - notably for carbon, watershed management and biodiversity.
>
> The relative role that each one of these four sources will play depends on the precise circum-stances of a particular protected area. Every effort is made to keep costs to a minimum and to generate revenues but the reality is that some parks will require ongoing financial assistance to be sustainable in the long term.
>
> (www.africanparks-conservation.com/what_future.html.)

CONCLUSION

What would happen if there were no management contract nor management plan for NSNP? Mark Stanley-Price, one of the visionary founders of the MC, in his January 2000 preliminary document outlined possible issues around private management of the Mara Triangle. He included a list of the "Costs of Doing Nothing" that offer parallels to NSNP:

- Deforestation will proceed quickly in some areas
- Much of the agricultural practices on newly cleared land will not be appropriate for the area, leading to erosion, soil and fertility loss
- The perennial rivers will carry greater silt loads and tend to become more seasonal in their flows
- Deforestation on the plateau beyond a certain point will have serious negative effects on the national economy through decreased rainfall both locally, but especially affecting the tobacco and commercial sugar estates of South Nyanza
- If habitat conversion continues, species of plants and animals will be lost from the area, or possibly from Kenya in view of the particular biodiversity value of these forests; cultural values will also suffer
- Insecurity is likely to spread and intensify to the extent that people may be totally impoverished and forced to abandon their homes. Despite any apparent advantage from leaving land to flourish under lighter human impacts, vacated areas are likely to be invaded by squatters and become even greater security risks to neighboring areas. This would not be in the interests of conservation / tourism activities
- It is being recorded that some overseas tourists will not return to the Mara Game Reserve because of the environmental practices of some of the lodges

If there is a productive NSNP management plan, and if the Ethiopian government and APF can create appealing incentives to the local people to vacate and respect the value of NSNP, conservation measures can be taken that will maintain the park's outstanding natural resources. At the same time such actions would provide development opportunities and sustainable benefits to the area's residents. This would have the domino effect of accruing benefits to the local, district, regional and national economies, as tourists put NSNP on their safari itineraries and the concomitant revenue stream increases. If a management plan for NSNP creates a successful example of environmental wildlife conservation, it can serve as a model for the rest of the country and for other challenged African nations.

Perhaps, one step further, the private management plans of NSNP and the MC can provide the

inspiration, incentive and models for a new private management endowment fund. For instance over the last three years, Richard Leakey has been proposing an emergency fund for wildlife that would receive initial funding from the World Bank scheme. Others are considering endowment funds that would assist start-up conservancies and/or those needing assistance with one-time capital expenditures like fencing, the cost of which tourism revenue doesn't cover. Such initiatives could perhaps be structured like a venture capital fund to financially support 80% of Africa's protected areas' running costs -- which is what is needed today. If an Ivy League U.S. university can have an endowment fund that yields one billion dollars per year, it shouldn't be impossible to create a fund that could yield $50 million per year! This new financing vehicle would differ from governments or large NGO's in that it would not carry large overheads, such as the 24% incurred by Conservation International.

Is this possible? The Mara Conservancy has proven to be a success. Nech Sar National Park has the potential to follow that success. Private management of protected areas with a community-based approach can provide management plans that may not be perfect, but are perhaps the best option available. Well-funded private management groups like APF and MC have the luxury of garnering and applying the knowledge and skills of scientists and scholars throughout the world. A major effort is needed to change the face of conservation in Ethiopia – one that sustains its human communities as well as wildlife. Lessons across Africa have shown that the protection of a single species in isolation has limited long term prospects. Perhaps partnerships that are being formed today in NSNP with Gugi and Koire people, the Government, private sector managers, tourists and scientists will spawn solutions unimaginable today. For instance, is a migratory corridor REALLY impossible in the long term, even if it's not in the foreseeable future? There are interesting models in Africa that suggest so. They should be studied carefully.

In Kenya, conservation has had a chance to become further developed than in Ethiopia. In certain areas of Kenya some private landowners have been granted control over wildlife over a wide area – including the permission to crop a quota of wild animals if necessary. As a result, wildlife numbers are increasing in these private domains more than elsewhere in Kenya. Rupert Watson, a Kenyan lawyer and conservationist, has observed:

> Success on this scale [a giant circle of land with a diameter of about 100 kms.] gives credence to the vision that Kenya – all of it – could be one huge conservation area in which wildlife is part of the natural furniture, fully integrated with modern economics and as much a part of business and private property as cows and goats and wheat and maize. And just as diligently bred, nurtured…. and harvested.
>
> This new voice in the wildlife policy debate could rock conservation cliques and establishment thinking. It comes softly but surely from a man [we] had better listen to. He is Koikai Olitipitip [a Maasai chief, now chairman of the Kenya National Wildlife Association] who says, "First we must ensure the right balance between freedom to exploit wildlife and the responsibility to preserve it. To do that we need a communications system to build awareness and understanding; to let the individual landowner understand the part he can and must play in the global conservation picture, and to let the conservation establishment understand how the land-owner can and must benefit.
>
> To a far greater degree than many people realize, Kenya's landowners appreciate the priceless heritage of wildlife for its own sake as well as for its commercial value; and they appreciate that we hold this heritage in trust not just for the community or country, but for the rest of the world. We can and will devote our land to that trust, but the rest of the world must be ready to pay the price.

Olitipitip has spoken a pan-African message that in its conclusion probably applies even more to Ethiopia than Kenya. If the world will back Ethiopia in preserving its wildlife, it will be doubly rewarded because in doing so it will also conserve habitats and forest ecosystems. When that happens, people and wildlife will have a healthy future together in natural habitats.

APPENDIX ONE

AFRICAN PARKS FOUNDATION: MANAGEMENT GUIDELINES

(Excerpts from African Parks Online, http://www.africanparks-conservation.com/how.html, accessed Dec. 23, 2005)

"Our management cycle starts with the planning of activities that deliver targets and goals. These targets and goals reflect the biological and social role of the protected area and are designed to maximize the revenue earned from the investment. Park coordinators and managers are delegated total authority to make day-to-day decisions or tactical changes in order to deliver our outputs and achieve our strategy. We use approaches and attitudes that are typical of business management: we have short communication lines in order to facilitate decision-making; delegation is clear and is designed to facilitate action rather than guard against even the most unlikely risk.

The African Parks Process - Following signature of letters of intent with the national government, each park goes through a four-stage progression:

1. Appraisal – This takes up to a year from the arrival of our coordinating team in the park. The forecasts and information available at the time of signing the letter of intent are tested against realities on the ground. We have to be sure that decline has not proceeded so far as to make restoration impossible, and that plans for future revenue generations are achievable

2. Restoration – This phase consists of remedial work required to secure the park's boundaries and remove the immediate threat of uncontrolled poaching, engaging the local community's enthusiasm and support, and undertaking the process of re-introducing lost species

3. Operations – Re-introduced and newly protected species and landscapes are consolidated. We also ensure that the park builds up to carrying capacity, training and employing local people and developing the potential for local businesses. The park strategy is developed and approved

4. Revenue generation – The last and longest phase, when the park becomes sustainable in terms of commercial activity and biodiversity, with well-established management practices and procedures. The park management strategy is under implementation.

Managers of the parks are set biological and sustainable development objectives, along with infrastructural improvement and commercial revenue targets. Once agreed, these are funded through agreed budgets. Managers are delegated responsibility for their budgets including the flexibility to change cost allocations in order to achieve their targets and managers are rewarded for exceeding their targets. All funds generated by the park stay in the park."

African Parks Foundation Disclaimer on Nech Sar NP

"African Parks has never been and will never be involved in questions of a political nature, such as the resettlement of people. We can work very well with people living in Parks, as we do with over 20,000 people living in the Liuwa National Park in Zambia. Resettlement is not a matter for our organization as Governments are sovereign in these matters in every country of the world. We do provide humanitarian help to people in and around the Park and of course therefore also to the Guji's and Kore people. Further enquiries on Nech Sar National Park can be made to our local coordinator, Mr Mateos Ersado, telephone +251 6 810 387. E-mail apnsp@ethionet.et."

--- Paul van Vlissingen, Chairman

APPENDIX TWO

THE MAASAI MARA AND THE MARA TRIANGLE

The Maasai Mara National Reserve is the most important wildlife area in Kenya. It forms the northern end of the Serengeti ecosystem, and is a critical link for the last great wildlife migration in Africa. It is also vital for Kenya's wildlife tourism industry and economy, since it provides some of the best game viewing in the world, particularly for large cats. It is probably Kenya's most internationally recognisable, and hence valuable, brand.

The Maasai Mara is a National Reserve, not a National Park, which means that it is held in trust and managed by the local county councils as opposed to the Kenya Wildlife Service. For most of the time since Independence, the Maasai Mara was managed by the Narok County Council, but the area to the west of the Mara River was carved out of Narok in the mid 1990s, which became TransMara District. The TransMara County Council then became responsible for the management of the section of the Maasai Mara National Reserve falling within their jurisdiction – known as the Mara Triangle.

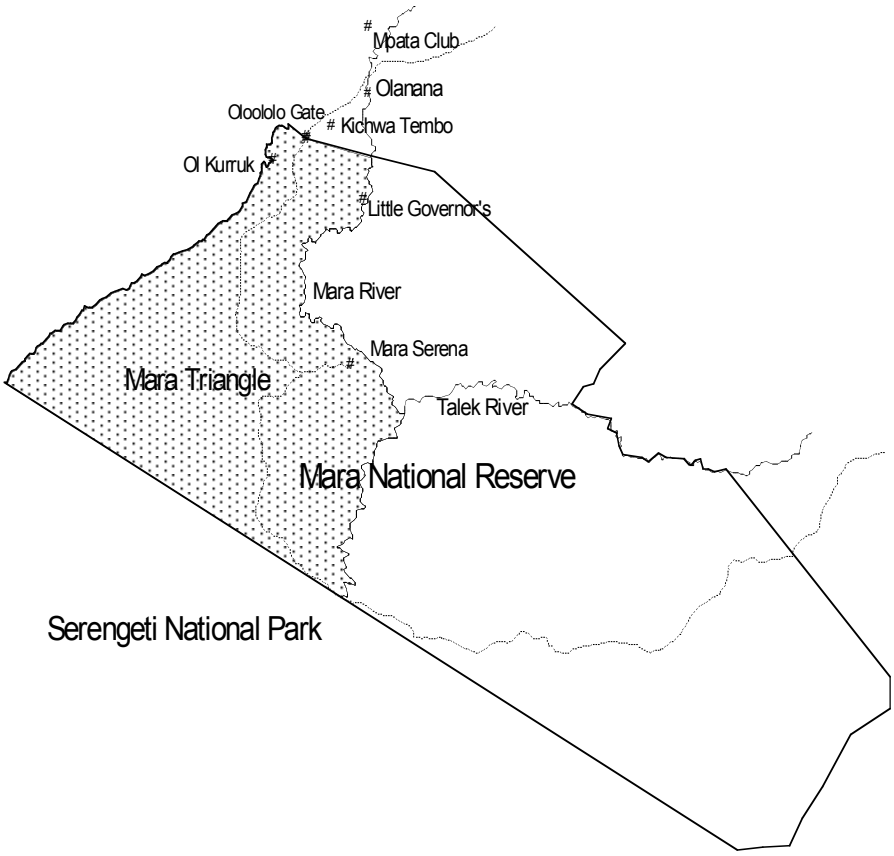


Figure 1: Map showing location of Mara Triangle within Maasai Mara National Reserve.

FORMATION OF THE MARA CONSERVANCY

There has been significant public concern about the management of the Maasai Mara, particularly related to an increase in poaching, a decline in the status of the infrastructure, especially the roads and game-viewing tracks, and uncertainties about how effective revenue collection procedures have been in returning funds to management and to the County Councils. For these reasons, the TransMara County Council has pursued the idea of subcontracting management of the area to the private sector. These plans came to fruition with the signing of a management agreement with the Mara Conservancy – a not-for-profit company limited by guarantee – which took effect on 11th June 2001.

The purpose of establishing this new system of management is to provide effective wildlife management and revenue collection procedures. This is being achieved through clear separation of authority between revenue collection and its supervision, and by the employment of a professional management team. The benefit of this arrangement for the Trans Mara County Council is that it is in receipt of greater funds from the Reserve than under the previous arrangement, and no longer has the responsibility and cost of managing the Reserve.

The structure of the Mara Conservancy is designed to ensure:

Accountability
Transparency
Efficiency

Accountability is provided through a Board of Directors, with some members representing central and local government and the Maasai people, and others providing relevant technical skills, particularly in the areas of Protected Area Management, Ecology and Wildlife Management, Financial Management and Tourism.

Transparency comes from clear division of responsibilities between managers, revenue collectors, accountants and policy makers (particularly ensuring that different people are responsible for revenue collection and its monitoring), and financial oversight by independent auditors working to international standards. This will be backed up by regular publication of information, including financial information, about the activities of the Mara Conservancy.

Efficiency is provided by:

Employment of a professional team of managers;
Development of a management plan and standard operating procedures;
Contracting out management activities such as revenue collection to other organisations with specialised skills.

PRINCIPAL STRATEGIC OBJECTIVES

The Mara Conservancy has the following principal strategic objectives:

To improve the management of the Mara Triangle, in particular reducing poaching and improving the facilities and overall experience for tourists.

To demonstrate the value of public-private partnerships in the management of National Reserves.

To improve the level of revenues reaching the County Council from the Reserve.

To provide enhanced security to local communities particularly against cattle raiding.

To provide more and better employment.

To increase the area of wildlife habitat, providing privately owned and managed buffer zones to the reserve.

SOURCE : Thouless, Chris. "Conserving the Greater Maasai Mara Ecosystem: an Introduction to the Mara Conservancy and Mara Conservation Trust." November 2001.

APPENDIX THREE

LAKE MANYARA GROUND WATER FOREST, TANZANIA

This type of forest is reminiscent of tropical rain forests, with lush green vegetation lit by shafts of sunlight and filled with many varieties of birds and other animals. However its water is derived from the ground, not high levels of rainfall. The high water table is fed by seepage from the volcanic rock of the rift wall. It has different types of vegetation growing at three separate levels: Tall trees, intermediate-level shrubs, and grasses, reeds and other flowering plants at low levels.

Animal Species
*Papio anubis (*Olive Baboon (Diet: grass, roots, fruit and insects, rarely immature impala or antelopes)
*Loxodonta Africana (*African Elephant)
*Cercopithecus mitis (*Blue monkey (Feed in higher tiers of forest on leaves and fruits of forest trees)
(Fruit bats. Eat from tamarind trees)

Bird Species
Silvery-cheeked hornbill

Tree Species
Upper level:
- *Trichilea emetica*
- *Croton macrostachys*
- *Antiaris toxicaria*
- *Bridelia micrantha*
- *Rauvolfia caffra*
- *Ficus sycamorus* (Wild fig)

Intermediate level
- Hibiscus
- Abultilons
- Wild ginger

Low level
- *Cyperus alternifolius* (reed)

Swamp
Typha (tall reed)
Cyperus immensus (tall reed)

On Drier, Fringe Areas
Star grass
Kigelia Africana (Sausage Tree)
Tamarindus indica (Tamarind Tree)

Information from: Snelson, Deborah (Editor), Lake Manyara National Park. Published by Tanzania National Parks. Nairobi: Prudential Printers, no date given. Book acquired in 1988.

APPENDIX FOUR

ETHIOPIAN MONTANE FORESTS – WWF REPORT

The Ethiopian Montane Woodland eco-region is biodiverse, poorly known and highly threatened. The rugged topography of this eco-region rings the highlands of Ethiopia and Eritrea, extending to outlying massifs in Sudan. Formed by volcanic forces 75 million years ago, these highlands were covered with Eurasian tundra-like vegetation during the last Ice Ages. Today, remnant patches of natural vegetation consist mostly of podocarpus and juniper forests, with some acacias found at lower elevations. While soils are rather infertile, this area is densely populated and most land has been converted to agriculture. Notable endemics found here include the Yellow-throated serin and Prince Ruspoli's turaco. Many of the endemic species are threatened due to the loss of their habitat.

Location and General Description

This eco-region is highly biodiverse, relatively poorly known and highly threatened. It is mainly found on the margins of the highlands of Ethiopia and Eritrea. Isolated montane outliers include Jebel Elba and Jebel Hadai Aweb, parts of which are politically in Egypt although they are administered by Sudan: Jebel Ower near Port Sudan; and the Goda and Mabla massifs in Djibouti. The altitudinal limits of the eco-region vary from one locality to another depending upon annual precipitation, but are generally between 1,100 and 1,800 m. From May to October, winds blow from the southwest and bring rainfall to the Ethiopian portion of the eco-region. During the rest of the year, onshore winds from the Red Sea bring moisture to the Eritrean side of the mountains. Rainfall varies from 600 mm in the driest sites to more than 1,500 mm in wetter areas. Humidity is sometimes higher than would be expected from these figures, due to cloud precipitation and local interactions between topography and weather. Unlike the moist equatorial mountains, the effects of cold descend further down on these dry highlands. Temperatures vary according to the season and elevation, but mean maxima lie between 18° and 24°C. Mean minima are between 12° and 15°C.

Ancient Precambrian basement rocks form the substrate of the montane forests in southwestern Ethiopia and Eritrea. The topography is generally rugged, and soils are rather infertile. The main Ethiopian and Eritrean dome began to rise 75 million years ago, eventually dividing into two halves, the northern and southern highlands. A turbulent volcanic period ended four to five million years ago, followed by climatic fluctuations in the Pliocene and Pleistocene. Glaciers formed on the peaks of the Ethiopian highlands while surrounding areas, including this eco-region, were covered with vegetation similar to Eurasian tundra. Separated by the Great Rift Valley, the northern and southern highlands were colonized by new species from different directions. The jebels and escarpments along the Red Sea linked Eritrea and northern Ethiopia with the Palearctic region while southern Ethiopia had a rift-wall connection to the Horn of Africa. Both the western and eastern highlands were invaded by tropical species that could penetrate the Nile floodplains in the west or the Kenyan deserts in the south. Despite the climatic differences, the surrounding lowlands provided the most consistent source of new species, so that these highlands show both Afrotropical and Palearctic influences (Kingdon 1989).

Phyto-geographically, the eco-region is part of the Afro-montane archipelago-like regional center of endemism (White 1983). The area supports East African evergreen and semi-evergreen forests through to bush lands. At lower elevations, woodland, known as *kolla*, is dominated by *Terminalia*, *Commiphora*, *Boswellia* and *Acacia* species. However, at moister or higher locations the vegetation is called *weyna dega* and is increasingly dominated by the conifers *Podocarpus falcatus* and *Juniperus procera*. The low, dry portion of the Harenna forest south of the Bale Mountains N.P. reflects the type of forest that once covered a large part of Ethiopia and possibly Yemen. *Coffea arabica* is the dominant understory shrub and wild coffee is still harvested extensively. The tall, open canopy consists of *Warburgia ugandensis*, *Croton macrostachyus*, and *Syzygium guineense*, with emergent *Podocarpus falcatus*. At higher elevations, moist pockets of dense forest grow, with abundant lianes and epiphytes. Trees here are typical of eastern Africa, with *Aningeria* and *Olea* being dominant (Kingdon 1989).

Biodiversity Features

Forest types present in this eco-region range from wet to dry, giving the area high biodiversity values. The patterns of endemism and their association with the forests of the area are complex and have been presented elsewhere (Friis 1992, Lovett and Friis 1996). There is an area of bird endemism on the southeast corner of the southern Ethiopian highlands and another one in the higher plateau of the northern Ethiopian highlands and Eritrea (Stattersfield *et al.* 1998). Other plant and animal endemics are found along the drier northeastern margins of the Ethiopian highlands, which link to the mountains of northern Eritrea and Somalia as well as the Day Forest in the Goda Massif in Djibouti. This small outlier in Djibouti is an important forest island in a sea of semi-desert, with at least four known endemic plant species (Magin 1999). The relatively unexplored Harenna forest in southern Ethiopia is however probably the most biodiverse area in the eco-region.

Because humans have intensively occupied the highlands of the Horn of Africa for thousands of years, it is difficult to gauge the extent to which the eco-region was formerly forested, and the extent to which it has always consisted of a natural grassland, thicket, and forest mosaic. Remnant ancient trees in enclosed cemeteries provide evidence that forest was previously much more widespread. Nievergelt *et al*. (1998) report that even these forests may be used for cattle pasture or to obtain wood. A large portion of the eco-region is now covered by farmland or secondary vegetation derived from agricultural or wood-harvesting activities (Friis 1992). For example, 88 percent of the Day Forest in Djibouti has been lost in the last two centuries, and more than 20 percent of the loss has occurred in the last 50 years (CNE 1991).

Threatened species include four strict endemics, including Djibouti francolin (*Francolinus ochropectus*, CR), Harwood's francolin (*Francolinus harwoodi*, VU), Prince Ruspoli's turaco (*Tauraco ruspoli*, VU) and yellow-throated seedeater (*Serinus flavigula,* VU), all of which are primarily threatened by habitat loss (Magin 2001). Prince Ruspoli's turaco is further restricted where its range overlaps with the near-endemic white-cheeked turaco (*Tauraco leucotis*). Where both species are present, Prince Ruspoli's turaco is only found in juniper forest, but where it occurs alone, it inhabits both broad-leaved and juniper forest. Both birds are part of a recent radiation of small, red-winged turacos. However, the white-cheeked turaco is extremely adaptable and the regional representative of a type that is found across all of Africa. Prince Ruspoli's turaco has not become significantly distinct and is declining as the white-cheeked turaco advances (Kingdon

1989). The ecoregion also contains part of the South Ethiopian highlands endemic bird area (Stattersfield et al. 1998), centered on the forests, grasslands and thickets to the southwest of the Bale Mountains and including the Yabello Sanctuary at around 1,700 m where the endemic Sidamo lark (*Heteromirafra sidamoensis*, EN), white-tailed swallow (*Hirundo megaensis*, VU) and Ethiopian bush-crow (*Zavattariornis stresemanni*, VU) occur. Other birds considered as near-endemic to this ecoregion include dark-headed oriole (*Oriolus monacha*), Abyssinian catbird (*Parophasma galinieri*), Abyssinian slaty flycatcher (*Dioptrornis chocolatinus*), and yellow-fronted parrot (*Poicephalus flavifrons*).

Mammals with ranges restricted to Ethiopia that occur in this eco-region include the shrew, *Crocidura harenna* CR, the narrow-footed woodland mouse (*Grammomys minnae*), and Menelik's bushbuck (*Tragelaphus scriptus meneliki*), a subspecies of bushbuck with long, dark fur. Males are black while females are chestnut colored with white spots. Some other mammals found in this ecoregion are: olive baboons (*Papio anubis*), black and white colobus monkeys (*Colobus guereza*), black-faced vervet monkey (*Cercopithecus aethiops aethiops*), bush duikers (*Sylvicapra grimmia*), warthogs (*Phacochoerus aethiopicus*), bush pigs (*Potamochoerus porcus*) and hippopotamus (*Hippopotamus amphibius*). Predators include caracals (*Caracal caracal*), golden jackals (*Canis aureus*), black backed jackals (*Canis mesomelas*), leopards (*Panthera pardus*, EN), lions (*Panthera leo*, VU), spotted hyaenas (*Crocuta crocuta*) and servels (*Felis serval*). Antelope species found here include Swayne's hartebeest (*Alcelaphus buselaphus swaynei*, EN), Guenther's dikdik (*Madoqua guentheri*) and greater kudu (*Tragelaphus strepsiceros*). Many of these larger mammals are only found in protected areas, most notably Nechisar National Park. In the early 1900s, elephant (*Loxodonta africana*), black rhinocerous (*Diceros bicornis*), buffalo (*Syncerus caffer*) and oryx (*Oryx gazella*) were found in the Nechisar area but all have been eliminated (Yalden *et al*. 1996).

Although accurately ascribing species of amphibian and reptile to this complex ecoregion has proven problematic, there are believed to be a number of strict and near-endemic species of both taxonomic groups in these forests. Of the five endemic amphibians two are tree frogs (*Afrixalus clarkei* and *Afrixalus enseticola*), two are ranid frogs (*Phrynobatrachus bottegi* and *Phrynobatrachus sciangallarum*), and one is a caecilian (*Sylvacaecilia grandisonae*) . Two endemic chameleons are found, including two species of chameleons, *Chamaeleo balebicornutus* and *Chamaeleo harennae*.

Current Status

The eco-region is poorly protected, although some small areas are included in Ethiopian protected areas that primarily encompass other eco-regions. Ethiopian Montane Woodland is contained in the Babile Elephant Sanctuary, Awash N.P., Omo N.P., and Nechisar N.P. Many of these protected areas, such as controlled hunting areas and wildlife reserves, offer little to no protection for native flora and fauna (Yalden *et al.* 1996). The very few patches of natural forest remaining are mostly found in the southwest where rainfall is highest. Smaller areas of drier forest are also found to the north on the scarp slopes facing the Red Sea and Gulf of Aden. Non-forest habitats are also found, but are principally located within areas of very high population density; and, little remains in a natural state, except in rocky ravines and other inaccessible areas.

Types and Severity of Threats

All natural habitats in the eco-region are highly threatened because they have been reduced to small patches, are severely fragmented, and poorly protected. Agriculture is the main threat,

coupled with exploitation of trees for fuel wood and timber. Tilahun *et al.* (1996) report that a sawmill has been constructed in Mena, on the southern border of the Harenna forest and the large timber trees are being logged out. The expanding urban population in this region, which utilizes these forests for construction material, fuel and charcoal, threatens the Harenna forest. Traditionally, the Harenna forest was used for gathering honey, coffee and other forest products as well as cattle grazing.

In many places within this eco-region, poor agricultural methods and overgrazing have resulted in intense soil erosion. A protected area system in Djibouti, Ethiopia and Eritrea that better covers the habitats of the eco-region is urgently needed. When political stability returns, a will be to assess the remaining habitats and species compositions of the small areas of this eco-region in Somalia. Cultivation, grazing and removal of firewood are all serious concerns within protected areas as well. Nechisar N.P. is threatened by intensive natural resource use, fueled by the fast growth in the nearby town of Arba Minch. Previously one of the best-protected areas in the country, the park is now exploited for livestock grazing and wood for construction and fuel (Tilahun et al. 1996).

Justification of Eco-region Delineation

This eco-region is based on the 'East African evergreen and semi-evergreen bush land and thicket' and 'cultivation and secondary grassland replacing upland and montane forest' vegetation units mapped by White (1983). The cultivation and secondary grassland areas are included in an effort to cover potential vegetation. The eco-region lies between 1,100 m and 1,800 m in elevation. Although the Day Forest in the Goda Massif in Djibouti is not mapped in this assessment, its affinities to the Ethiopian Highlands are recognized.

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THIS REPORT Prepared by: Chris Magin, Miranda Mockrin
For more general information on this ecoregion, go to the WildWorld version of this description. World Wildlife, Online: http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0112_full.html#status
Accessed Dec 05

APPENDIX FIVE

SWAYNE'S HARTEBEEST *(Alceluphus buselaphus swaynei, Amharic: Korkay)*

GENERAL INFORMATION

The Hartebeest (Alcelaphus buselaphus) is a grassland antelope found in West Africa, East Africa and Southern Africa. The Hartebeest stands 4-1/4 to 5 ft tall at the shoulder and weighs anywhere from 265-550 lb. Male Hartebeest are a dark brown color while females are yellow brown. The ringed horns found in both sexes to start close together at the base, and then curve outwards, then forwards, and finally backward. They can reach a length of 27 in. Hartebeest live in grassland and open forest where they eat grass. They are diurnal and spend the morning and late afternoon eating. Herds contain five to twenty individuals but can occasionally contain up to three hundred and fifty. Its habitat is open country and light bush, particularly in undulating country, sometimes in tall savanna woodland, but never in dense thicket They are social animals, usually seen in herds of 4 to 15, sometimes as many as 30. IN the past they were recorded as congregating by the thousands. They often associate with zebras. Where water and grazing are adequate, they are the most sedentary of all major antelopes, but they will move great distances according to season if necessary. Primarily grazers, they are fond of young growth on burns. *If water is available they drink regularly, but can survive for long periods without it.

The common African hartebeest has fifteen races of which two are already extinct and Swayne's is seriously endangered. The Swayne's hartebeest used to occur throughout the Rift Valley eastwards into northwestern Somalia, but has come close to extinction after the rinderpest epidemic and uncontrolled hunting of the early twentieth century. Its present range is restricted entirely to the southern Rift Valley of Ethiopia, with viable breeding herds protected in 3 national parks in the Rift Valley, of which NSNP is the most viable habitat. As Swayne's hartebeest is listed as in imminent danger of extinction, it is protected by law in Ethiopia. The only other habitats are in Senkele and Yabelo sanctuaries nearby.

The evolutionary theory on hartebeest espoused by Jonathon Kingdon is that forests have been isolating barriers preventing hybridization of species such as the hartebeest. "The distribution of two well-defined races of hartebeest, *alcelaphus buselaphus cokii*, in southern Kenya and northern Tanzania, and *Alcelaphus buselaphus jacksoni,* in Uganda and northwest Kenya, suggest that they were separated by forest. At some time in the past a belt of suitable habitat to the east of Mt Kenya and in the drier eastern rift valley provided opportunities for the two populations to meet, and these areas became hybrid zones. The northern race, *A. b. jacksoni*, has southern extensions of range, which are well within or beyond the former forest belt. The colonization of these areas may have been assisted by climatic change, but it is worth noting that the western extension is along the migration routes of the pastoral Bahima coming from the north in the thirteenth century (see Dale, 19954), and that grazing conditions have been encouraged by pastoralists burning the range for their stock, which as well might have suited the hartebeest.

…The vegetation of the northern savannas, sandwiched between forest and the Sahara Desert, forms serial belts which have migrated north and south, but have not been complicated by great changes of altitude, or chopped up and isolated in the complex mosaic pattern found in southern and eastern Africa. Perhaps it is for these reasons that the northern savannas have not provided the same opportunities for speciation as the southern ones and are much poorer in number of species. The simple homogeneous nature of the northern savanna belts may therefore discourage their colonization by some southern savanna species. (Kingdon, East African Mammals, pp 79, 80)

This information has been compiled from:

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Kingdon, Jonathan. East African Mammals, Volume 1: an Atlas of Evolution in Africa. Chicago: the Univeristy of Chicago Press, 1974

MORE DETAILED INFORMATION

"Hartebeest are almost grotesquely long-faced and have high withers and sloping hindquarters. The horns, carried by both sexes, are doubly curved and mounted on a pedicle. Some authors still consider that according to the shape of the horns, which is supposed to be the most important diagnostic character, each race of hartebeest should enjoy full specific rank. However, the presence of hybrid forms has led zoologists to regard them as a sub-species, and it is now generally accepted to classify them as geographic representatives of the same species.

Three types of horns can be distinguished in the buselaphus group:: U-shaped as in the now-extinct North African buba hartebeest, and in the western hartebeest from Gambela, Nigeria and Cameroon; V-shaped as in the Lelwel Hartebeest *(A. buselaphus lelwel),* Jackson's Hartebeest *(A.b. jacksoni),* and the South African cape hartebeest *(A.b. caama),* (all of which have very long heads and a uniform red-brown colour). The third type of horn is shaped like inverted brackets as in Coke's Hartebeest *(A.b. cokii),* in the pale tawny *A.b. tora* from Sudan and Ethiopia, and Swayne's Hartebeest, previous]y found in both Somalia and Ethiopia, but now restricted only to Ethiopia.

In 1891-2, Brigadier-General Swayne, who discovered what has become named Swayne's hartebeeste, was the first European to visit the area well south of the Golis range of Somaliland and about 200 kms. (125 miles) from the coast. The plains were described as

"covered with hartebeest, 300-400 to a herd and a dozen or so herds in sight at any time." Herds of a thousand individuals were observed. Within fifteen years the tens of thousands in Haud and Ogo that Swayne had seen had dwindled to such an extent that he estimated only about 880 remained. This rapid decline was due to the rinderpest, which swept Africa during the last century. The Somalis "went out daily and pulled down the sick animals with their bare hands in order to take the hides". Military campaigns followed in which the armed forces were permitted to kill as much game as they wanted. Arms flowed in and in the unsettled conditions, which prevailed hunters very efficiently, and in a very short time, had almost succeeded in wiping out the remnants of the Oryx and Hartebeest herds in the area.

Swayne's hartebeest… are deep red chocolate brown or chestnut with a fawn or cinnamon coloured rump, tail and lower half of legs. The tail tuft is black. Its face and upper parts of its body have dark blackish markings: a black stripe from the shoulder to the knee, a black smudge on the flanks, and black markings on the outside of the hind limbs are typical, but on the darkest individuals these black markings do not show clearly in the field. Adult specimens sometimes have a silvery appearance as the hairs are tipped with white. The horns are fully expanded and shaped like those of the tora; and curve out- wards and slightly downwards from the top of the head and then sweep upwards at the tips, and are usually, but not always, hooked backwards and they may or may not turn inwards.

Swayne's hartebeest lives in open country, light bush, sometimes in tall savanna woodland. These are social animals and are normally seen in herds of 4-15, up to thirty. Each herd is under the leader- ship of the master bull, which leads the females with their young. The territory is defended by the male. You may often see them grazing peacefully, with the bull on slightly higher ground acting as sentinel for his herd.

The small surviving population is now restricted to the grass and thorn scrub plains of southern Danakil and the Rift Valley lakes region, on the Alledeghi plains east of Awash and from Awash valley to the southern lakes. The Nechisar National Park has been established for their protection. Located on the shores of lakes Abaya and Chamo, the park is accessible from Arba Minch. The best-known herd is about 100 head which inhabits an area of 400 sq. kms. near the shore of lake Chamo. However, the largest known population is on the heavily settled plain of Senkela in the Shashemane area. Here there are probably about 500 now in excellent condition but less likely to survive because of pressure on habitat. This hartebeest is listed by the IUCN among the species in the world in "imminent danger of extinction" and is completely protected by law in Ethiopia (1972 Wildlife Conservation). Pressure on its habitat by human beings was the main cause of its decline, and it is to be hoped that with the creation of the national park and rigorous enforcement of the protection law, this beautifully coloured antelope will start to recover its numbers."

Excerpt Source:

Selamta, Swayne's Hartebeeste" Online: " http://www.selamta.net/hartebeest.htm. Accessed Dec 16, 2005

APPENDIX SIX

ECOLOGICAL NETWORKS, CORRIDORS, AND BUFFER ZONES

The challenge of maintaining landscape-scale ecological processes in the face of human pressures was probably recognized in Africa before any other continent. For many decades, however, it was associated solely with the conspicuous issue of long-distance movements by game species. This was not only an issue of importance to a very limited group, the actions taken to conserve these species and to protect valuable areas also served to exacerbate the divisions between settlers and native populations – both economically and geographically. In these circumstances, proposals to establish protected areas that prevent access to natural resources or to take conservation action on land that provides only a marginal livelihood to large numbers of natives inevitably came to be associated with colonial methods that disadvantaged local populations still further.

Perhaps more than on any other continent, the support of local communities for landscape-scale conservation is a crucial issue in Africa, whereby the promise of sustainable livelihoods becomes the central challenge. In most African countries, especially in southern Africa, land in rural areas is either communally owned or state-owned, or both. The number of "beneficiaries" from schemes such as wildlife corridors is usually so large that the individual benefit is very small. There is also an increasing perception that governments and conservation agencies are focusing more on wild nature than on human needs. Setting aside land for corridors can therefore be perceived as a loss of land for agriculture.

Given this historical legacy and the severe lack of resources, it is not surprising that relatively few ecological-network initiatives, corridors and buffer zones have been developed or that, where programs exist, their implementation has been impeded by intractable problems. Thus, corridors for game species often conflict with the subsistence needs of local populations, and trans-boundary conservation management programs can be perceived as weakening the nation state and empowering communities across national or local government boundaries. This raises the fundamental issues on the nature of borders. Should natural-resource management objectives determine where boundaries should be drawn? What is the status of national borders, which were imposed by colonists who have since relinquished power but are now promoting new boundaries in the form of protected areas and ecological networks?

At the same time, large areas are confronted with the over-exploitation of timber which, in addition to its impacts on biodiversity, both reduces the natural resources available to local populations and increases access to the remaining areas of forest and thereby increases the opportunities for illegal hunting. Dealing with these kinds of problems is a major task for large-scale conservation programs, especially those modeled on ecological-network principles.

Taken from: Draft of "Review of Experience with Ecological Networks, Corridors and Buffer Zones," from Convention of Biological Diversity's Program of Work on Protected Areas, Goals 1.2 and 1.3, pages 84, 85. Distributed Nov. 8 2005 to participants of the 8th World Wilderness Congress in Anchorage, AK. Available online: http://www.biodiv.org/programmes/cross-cutting/protected/eco-networks.shtml, Accessed 10 Nov. 2005.

APPENDIX SEVEN

CROCODILE HUNTING IN ETHIOPIA

African Indaba received this information directly from Tadesse Hailu, Head of the Ethiopian Wildlife Department: "The Ethiopian Wildlife Conservation Department of the Ministry of Agriculture and Rural Development has authorized a quota of 5 Nile crocodiles each for 2004 and 2005 hunting seasons on the extreme southeastern, southern and southwestern shores of Lake Chamo. The hunting zone is on the opposite side of Nech Sar NP and NOT within the park boundaries. The Ethiopian Wildlife Conservation Department confirmed in writing that the area is currently an open hunting area (not yet designated as a controlled hunting area) whereby all licensed safari outfitters have access to the area upon paying additional 10% of the hunting price to crocodile's hunting price, and hence Ethiopian Rift Valley Safaris (Nassos Roussos) and other licensed Safari outfitters will use this hunting area in 2005 and crocodile products harvested in the area are legally exportable."

Anthony Hall-Martin, Director of African Parks (Ethiopia) wrote in a letter, dated 14 January, that "Ethiopian Rift Valley Safaris has a properly formulated and legal concession from the SNNP authorities to hunt a limited quota of crocodiles, of a minimum length of 3m, in Lake Chamo. [The] area lies well outside the boundaries of Nech Sar NP in the southwestern corner of the lake. Several surveys have established that this is the largest crocodile population in Ethiopia, and that it can support the removal of limited numbers of adult crocodiles and hatchlings. The granting of the crocodile hunting concession was supported by the Zonal Authority, which represents the interests of the local community. African Parks has agreed to work closely with the SNNP authorities, ERVS and the local communities to manage the fish resources of Lake Chamo in accordance with the draft "Southern Nations, Nationalities and Peoples' Regional Government Fish Resources Management, Development and Control Proclamation". Our interest is to ensure that the utilization of the resources of Lake Chamo, be they crocodiles or fish, is sustainable. I have flown over the ERVS hunting concession, and also been there on the ground. I saw more than two hundred crocodiles longer than 1.5 m in the area. There were also many large crocodiles there, and at the same time the Crocodile Market population was at home."

AFRICAN INDABA Online: http://www.conservationforce.org/pdf/Indaba_Vol3_No2.pdf
"Crocodile Hunting: Ethiopia: e-Newsletter" Volume 3, Issue No 2 March 2005, Page 4.

APPENDIX EIGHT

APICULTURE IN ETHIOPIA

"Apiculture has a long tradition in Ethiopia, honey and wax long being exports. Beekeeping practices vary from one part of the country to the other. In areas where the value of honey playas a significant economic role, bees are tended well. Such areas are mostly located in western and southern parts, where the climate is generally wet and warm throughout the year, with many sunny days. A wide variety of natural vegetation covers these areas, with plenty of flowering plants. The natural conditions are said to be so well suited to bees that they are found in abundance.

Beekeeping among such southwestern peoples is quite unique in that they let the bees live in the wild. They are kept in hives, which are generally cylindrical in shape. These are made from hollowed out logs or bamboo. The outside part of the hive is smeared with cow dung and covered by straw and leaves. The inside part is intensively smoked with incense, to give it a better smell to attract the scouting bees. Once the cylindrical hive is prepared in such a manner it is hung up in the high branches of a tree. High branches are preferred based on the people's belief that bees like height. Also it is aimed at making the theft of hone more visible and difficult.

After being hung up, a hive may be occupied within a week depending, among other things, on its quality. When honey is ready to be harvested, the beekeeper opens the hive with the help of smoke, the traditional method of getting the bees out. Then, he quickly takes out the combs, which may then be squeezed to extract the honey to be sold in the market. Honey may be collected two to three times a year. The beekeeper visits his hives several times a year, not only to remove honey, but also to look after the bees."

Gomez, Carmen Porras, Ed. The Ark of Diversity: The Catalogue of the Anthropology Museum of the Institute of Ethiopian Studies. Addis Ababa: Addis Ababa University 2003.

APPENDIX NINE

FOREST-SERVICE PAYMENTS TO ALLEVIATE POVERTY AND SAVE FORESTS

Forests have always provided ecological services to the local people living in and around them. Recently, markets have also been developing where off-site 'buyers', sometimes far away from the forests, pay local people to preserve the flow of the ecological forest services they are interested in seeing maintained. The key areas include:

- Biodiversity
- Tourism
- Hydrological protection
- Carbon-sink functions

There is some ground for optimism that forest- service payments can help to reduce rural poverty, offering an additional source of income. Such payments tend to be more stable over time than the ones they are designed to substitute (e.g. the fluctuating prices of timber and cash crops). In addition, they can also induce a series of indirect benefits, follow up investments and external assistance (such as training and improvements in community organization, local knowledge about forest management and environmental quality).

However, there are uncertainties regarding how large and widespread such transfers will be - and to what degree poor people will be able to enter into these emerging markets. The poor are often disadvantaged by their insecure land tenure and the high transaction costs and risks that service buyers face in dealing with many smallholders or communities with internally divided interests. Yet, in spite of these constraints, potential payments for forest-based services all have a large global value and the increasing threats against them also enhance the users' willingness to pay to preserve them. Higher site-specificity and requirements for collective coordination across a larger area (e.g. to provide watershed protection or biodiversity corridors) can increase the ability of poor people to participate. The main challenge will be to design and experiment with institutional set-ups that include poor people as competitive suppliers of remunerated forest services.

Center for International Forestry Research, "Exploring the Forest-Poverty Link." May 2003, No 6 online http://www.cifor.cgiar.org/publications/pdf_files/infobrief/007-infobrief.pdf Accessed Dec 23, 2005

APPENDIX TEN

NSNP "Unofficial" BIRD SPECIES LIST

(Compiled by the author, Alison Jones, from on-line reports)

Grouse and Allies (Phasianidae)

Yellow-necked Spurfowl	*Pternistis leucoscepus*
African Quail	*Coturnix coturnix Africana*
Orange River (or Acacia) Francolin	*Scleroptilalevaillantoides*
Harlequin Quail	*Coturnix delegorguei***s**

Guineafowls (Numididae)

Helmeted Guineafowl	*Numida meleagris*
Vulturine Guineafowl	*Acryllium vulturinum*

Buttonquails (Turnicidae)

Small Buttonquail	*Turnix sylvatica*

African Barbets (Lybiidae)

Red-fronted Tinkerbird	*Pogoniulus pusillus*
* Banded Barbet	*Lybius undatus* - ENDEMIC
Black-billed Barbet	*Lybius guifsobalito*
Double-toothed barbet,	*Lybius bidentatus*

Typical Hornbills (Bucerotidae)

Eastern Yellow-billed Hornbill	*Tockus flavirostris*
Red-billed Hornbill	*Tockus erythrorhynchus*
African Gray Hornbill	*Tockus nasutus*
Von der Decken's Hornbill	*Tockus deckeni*

Ground-Hornbills (Bucorvidae)

Abyssinian Ground-Hornbill	*Bucorvus abyssinicus*

Hoopoes (Upupidae)

Black-billed Woodhoopoe	*Phoeniculus somaliensis*
Green woodhoopoe,	*Phoeniculus purpureus*

Typical Rollers (Coraciidae)

Lilac-breasted Roller	*Coracias caudata*
Rufous-crowned Roller	*Coracias naevia*
Abyssinian Roller	*Coracias abyssinica*
Broad-billed Roller	*Eurystomus glaucurus*

Halcyonid Kingfishers (Halcyonidae)

Gray-headed Kingfisher	*Halcyon leucocephala*

Cerylid Kingfishers (Cerylidae)

Pied Kingfisher	*Ceryle rudis*
Giant Kingfisher	*Megaceryle maxima*

Bee-eaters (Meropidae)

Little Bee-eater	*Merops pusillus*
Northern Carmine Bee-eater	*Merops nubicus*

Mousebirds (Coliidae)
Blue-naped Mousebird — *Urocolius macrourus*

Coucals (Centropidae)
White-browed Coucal — *Centropus superciliosus*
Green Coucal — *Ceuthmochares aereus*

Parrots (Psittacidae)
Red-bellied Parrot — *Poicephalus rufiventris*

Typical Swifts (Apodidae)
African Palm-swift — *Cypsiurus parvus*
Eurasian or Common Swift — *Apus apus*

Turacos and Allies Musophagidae
Bare-faced Go-away-Bird — *Corythaixoides personatus*
White-bellied Go-away-bird — *Corythaixoides leucogaster*
White-cheeked turaco, — *Tauraco leucotis*

Typical Owls (Strigidae)
Pearl-spotted Owlet — *Glaucidium perlatum*
Verreaux's Eagle-owl — *Bubo lacteus*
Spotted Eagle-Owl — *Bubo africanus*
Marsh Owl, — *Asio capensis*
African Wood Owl — *Strix woodfordii*
Pel's Fishing Owl — *Scotopelia peli*

Nightjars and Allies Caprimulgidae
Abyssinian Nightjar (aka Montane Nightjar) — *Caprimulgus poliocephalus*
Slender-tailed Nightjar — *Caprimulgus clarus*
Donaldson-Smith's nightjar — *Caprimulgus donaldsoni*
Plain Nightjar — *Caprimulgus inornatus*
Star-spotted Nightjar — *Caprimulgus stellatus,*
Frecked Nightjar — *Caprimulgus tristigma*

Pigeons (Columbidae)
Namaqua Dove — *Oena capensis*
Speckled Pigeon — *Columba guinea*
Laughing Dove — *Streptopelia senegalensis*
Ring-necked Dove — *Streptopelia capicola*
Emerald-spotted Wood-Dove — *Turtur chalcospilos*
Bruce's Green Pigeon — *Treron waalia*

Bustards (Otididae)
Kori Bustard — *Ardeotis kori*
Black-bellied Bustard — *Eupodotis melanogaster*

Sandgrouse (Pteroclidae)
Yellow-throated Sandgrouse — *Pterocles gutturalis*

Snipe and Allies *(* Scolopacidae)
African Snipe — *Gallinago nigripennis*
Green Sandpiper — *Tringa ochropus*
Common Sandpiper — *Tringa hypoleucos*

Jacanas (Jacanidae)

African Jacana	*Actophilornis africanus*
Plovers and Allies(Haematopodini)	
Black-winged Stilt	*Himantopus himantopus*
Wattled Lapwing	*Vanellus senegallus*
Crowned Plover	*Vanellus coronatus*
Hawks & Allies (Accipitridae)	
Scissor-tailed Kite	*Chelictinia riocourii*
Yellow-billed Kite	*Milvus parasitus*
African Fish-Eagle	*Haliaeetus vocifer*
Battaleur Eagle	*Terathopius ecaudatus*
Hooded Vulture	*Necrosyrtes monachus*
White-headed Vulture	*Trigonoceps occipitalis*
Short-toed Eagle	*Circaetus gallicus*
Montague's Harrier	*Circus pygargus*
Dark Chanting-Goshawk	*Melierax metabates*
Gabar Goshawk,	*Melierax gabar*
Long-legged Buzzard	*Buteo rufinus*
African Tawny-Eagle	*Aquila rapax rapax*
Osprey	*Pandion haliaetus*
Secretary bird (Sagittariidae)	
Secretary bird	*Sagittarius serpentarius*
Falcons (Falconidae)	
Common Kestrel	*Falco tinnunculus*
Greater Kestrel	*Falco rupicoloides*
Grebes (Podicipedidae)	
Little Grebe	*Tachybaptus ruficollis*
Anhingas (Anhingidae)	
African Darter	*Anhinga rufa*
Cormorants (Phalacrocoracidae)	
Long-tailed Cormorant	*Phalacrocorax africanus*
Herons (Ardeidae)	
Gray Heron	*Ardea cinerea cinerea*
Black-headed Heron	*Ardea melanocephala*
Great Egret	*Ardea alba melanorhynchos*
Common Cattle-Egret	*Bubulcus ibis ibis*
Squacco Heron	*Ardeola ralloides*
Goliath Heron	*Ardea goliath*
Ibises (Threskiornithidae)	
Sacred Ibis	*Threskiornis aethiopicus aethiopicus*
Pelicans and Allies (Pelecanidae)	
Eurasian White Pelican	*Pelecanus onocrotalus*
Storks and Allies (Ciconiidae)	
Yellow-billed Stork	*Mycteria ibis*
Marabou Stork	*Leptoptilos crumeniferus*
Abdim's Stork	*Ciconia abdimii*
True Shrikes (Laniidae)	
Gray-backed Fiscal	*Lanius excubitoroides*

Battaleur Eagle in NSNP ©Alison M. Jones

Common Fiscal	*Lanius collaris*
White-rumped Shrike	*Eurocephalus rueppelli*
Red-tailed or Isabelline Shrike	*Lanius isabellinus*
Red-shouldered Cuckoo-Shrike	*Campephaga phoenicea*
White-breasted Cuckoo-Shrike	*Coracina pectoralis*

Crows and Allies (Corvidae Corvini)

Pied Crow	*Corvus albus*	
Fan-tailed Raven	*Corvus rhipidurus*	
*Thick-billed Raven	*Corvus crassirostris*	ENDEMIC
Fork-tailed Drongo	*Dicrurus adsimilis*	
Black-crowned Tchagra	*Tchagra senegala*	
Slate-colored Boubou	*Laniarius funebris*	
Sulphur-breasted Bushshrike	*Telophorus sulfureopectus*	

Old World Flycatchers and Allies (Muscicapidae)

Common Redstart	*Phoenicurus phoenicurus*
Pied Wheatear	*Oenanthe pleschanka*
Isabelline Wheatear	*Oenanthe isabellina*
Pale Flycatcher	*Bradornis pallidu*
African dusky flycatcher	*Muscicapa adusta*

Starlings and Allies (Sturnidae Sturnini)

Greater Blue-eared Glossy-Starling	*Lamprotornis chalybaeus*
Rüppell's Glossy-Starling	*Lamprotornis purpuropterus*
Red-billed Oxpecker	*Buphagus erythrorh*

Swallows and Allies (Hirundinidae)

Barn Swallow	*Hirundo rustica*
Lesser striped-Swallow	*Hirundo abyssinica*

Bulbuls (Pycnonotidae)

Garden Bulbul	*Pycnonotus barbatus*
Northern Brownbul	*Phyllastrephus strepitan*s

African Warblers (Cisticolidae)

Rattling Cisticola	*Cisticola chinianus*
Siffling Cisticola	*Cisticola brachypterus*

Old World Warblers and Allies (Sylviidae)

Rufous Chatterer	*Turdoides rubiginosus*
Red-Faced Crombec (or Sylvietta)	*Sylvietta whytii*

Larks (Alaudidae)

Singing Bushlark	*Mirafra cantillans*	
*Northern White-Tailed Lark	*Mirafra albicauda*	ENDEMIC
Flappet lark,	*Mirafra rufocinnamome*	

Sunbirds and Allies (Nectariniidae Nectariniini)

Kenya Violet-backed Sunbird	*Anthreptes orientalis*
Collared Sunbird	*Anthreptes collaris*

Sparrows and Allies (Passeridae)

Swainson's Sparrow	*Passer swainsonii*
White-browed Sparrow-Weaver	*Plocepasser mahali*
Red-headed Weaver	*Anaplectes rubriceps*
Chestnut Weaver	*Ploceus rubiginosus*

Orange Bishop	*Euplectes franciscanus*
Brown Tree Pipit	*Anthus trivialis*
Mountain Wagtail	*Motacilla clara*
Yellow Wagtail	*Motacilla flava*
Grey Wagtail	*Motacilla cinera*

Finches and Allies (Fringillidae Carduelini)

Cinnamon-breasted Bunting	*Emberiza tahapisi*

Miscellaneous

African Black-Headed Oriole	*Oriolus larvatus*
Black-headed Oriole	*Oriolus larvatus*
Brubru,	*Nilaus afer*
Rueppell's Robin-Chat	*Cossypha semirufa*
Red-Capped Robin-Chat	*Cossypha natalensi*
White-browed Robin-Chat (aka Heuglin's Robin)	*Cossypha heuglin*
Familiar Chat	*Cercomela familiaris,*
Grey wren-Warbler	*Calamonastes simplex*
Greater (Common) Whitethroat	*Sylvia commun*
Levaillant's Cuckoo	*Oxylophus levaillantii*
Narina Trogon	*Apaloderma narina*
Greater Honeyguide	*Indicator indicator*
Scaly-throated Honeyguide	*Indicator variegates*
White-browed Scrub-Robin	*Cercotrichas leucophrys*
African Thrush	*Turdus pelios*
Olivaceous Warbler	*Hippolais pallida*
Common / Brown-throat Wattle-eye	*Platysteira Cyane*
Hammerkop	*Scopus umbretta*

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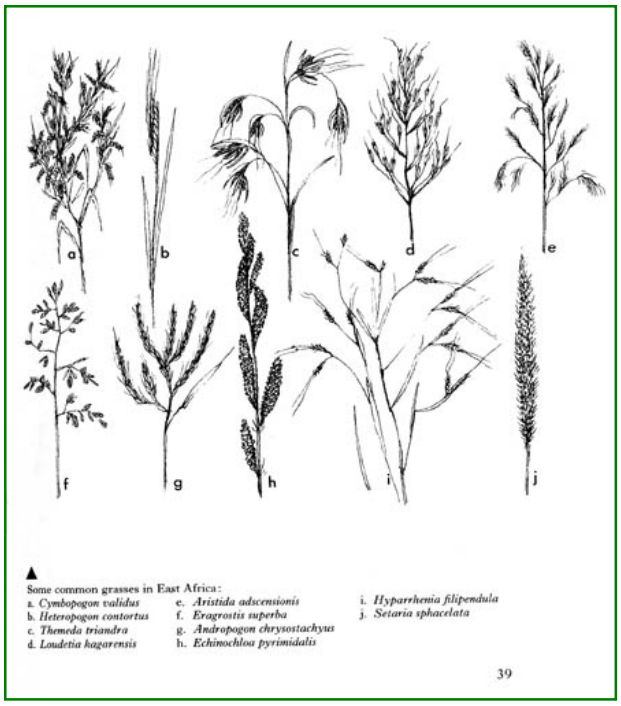

▲
Some common grasses in East Africa:

a. *Cymbopogon validus*
b. *Heteropogon contortus*
c. *Themeda triandra*
d. *Loudetia kagarensis*
e. *Aristida adscensionis*
f. *Eragrostis superba*
g. *Andropogon chrysostachyus*
h. *Echinochloa pyrimidalis*
i. *Hyparrhenia filipendula*
j. *Setaria sphacelata*

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