



CHYULU HILLS ECOSYSTEM

Importance, threats
and way forward

October 2011



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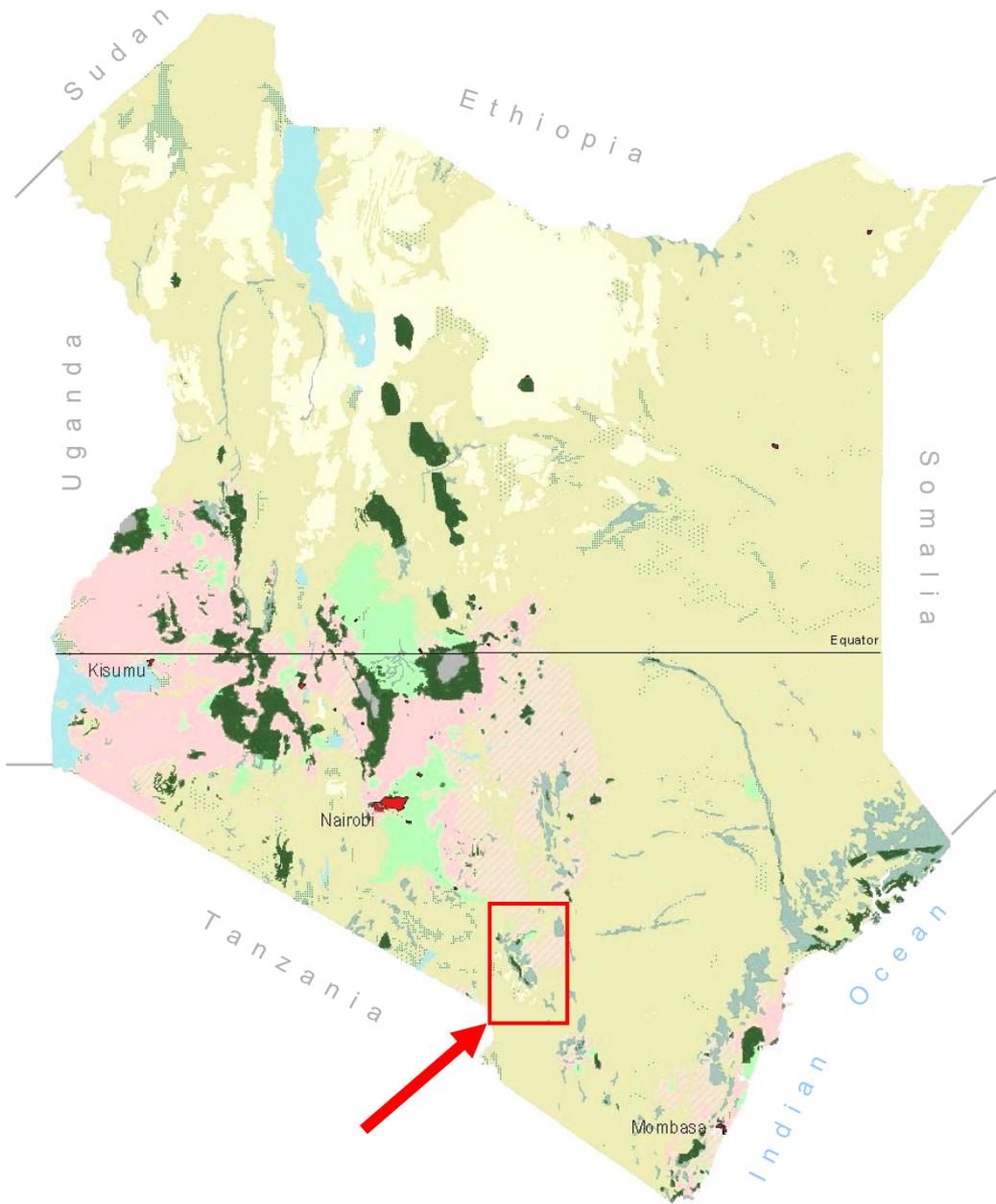
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Introduction: *location and extent*



- Situated 190 Km South-east of Nairobi, the Chyulu Hills cover some 200,000 ha.
- They are of relatively recent volcanic origin (abt 500 yrs) and the range is composed of ash cones and craters
- It is a critical ecosystem located in the expansive Amboseli-Tsavo ecosystem.



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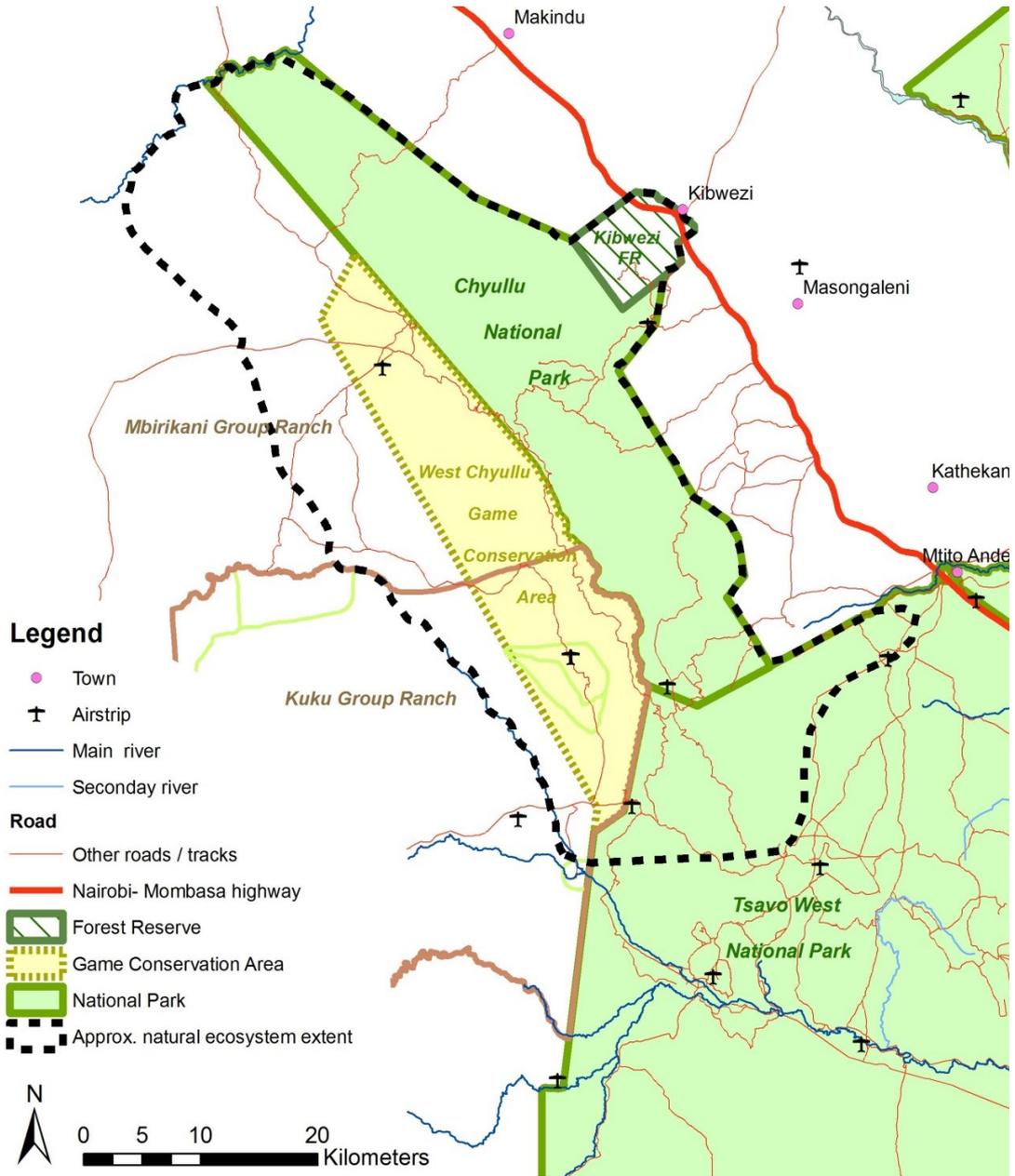
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Introduction: *ecosystem overview*



The Chyulu Hills ecosystem comprises mainly:

- Chyulu Hills NP
- Tsavo West NP
- Mbirikani GR
- Kuku GR
- Kibwezi FR

There is also a West Chyulu Game Conservation Area that spans over Kuku and Mbirikani GR, but the area is not gazetted.

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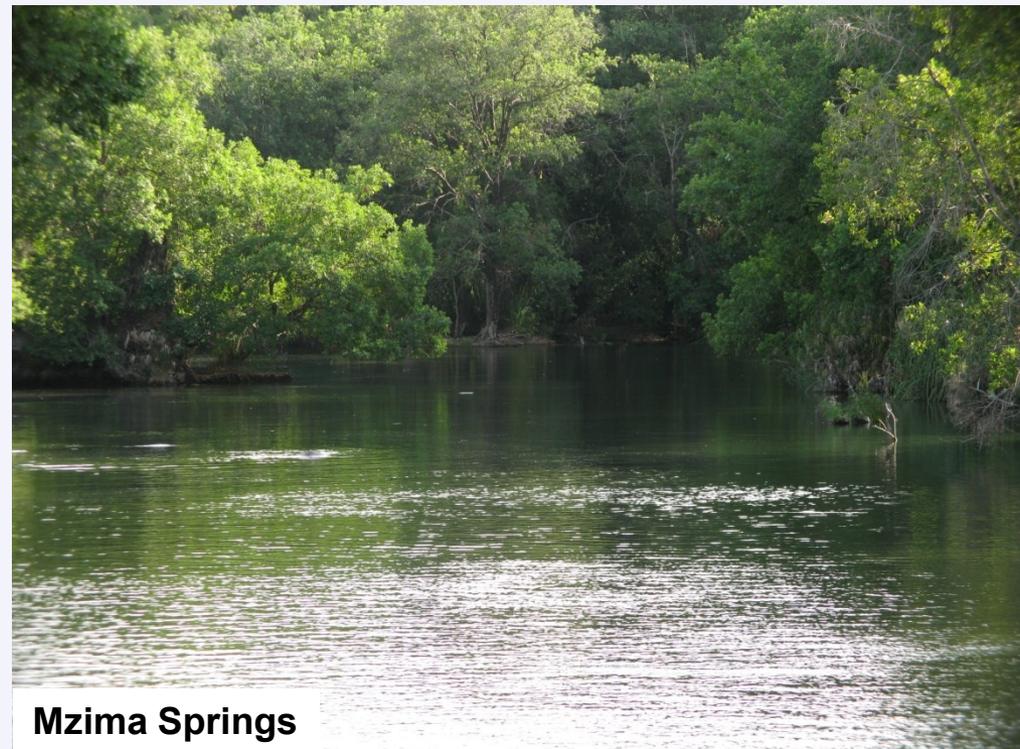
Values: *critical water catchment area*

The Chyulu Hills hold no permanent surface water but rainfall percolating through the porous rock feeds many permanent fresh water sources in the surrounding semi-arid plains and Coastal Region.

The Hills forms the catchment of the following springs and rivers :

- Mzima Springs
- Umani Springs
- Mang'ellete Springs
- Kibwezi Springs
- Olpusare Springs
- Makindu Springs

- Tsavo River
- Galana River
- Kiboko River
- Makindu River
- Thange River
- Kambu River
- Mtito Andei River



Mzima Springs

Values: critical water catchment area

- Over 95% of the water in the Coast Water Services Board area comes from the Bulk Water System.
- About 65 % of the people in the Coast Region depend on this System.
- Most of the towns and markets in the Coast Region depend on this System, i.e Mombasa City, Malindi, Kilifi, Kwale, Ukunda, Diani, Voi, Mariakani.
- The System comprises of four main schemes namely; Mzima Pipeline, Marere Pipeline, Sabaki Pipeline and the Tiwi Boreholes.

Name of Pipeline/Source	Year developed	Current Production		Sources Potential	
		(m3/day)	%	(m3/day)	%
Mzima 1 Pipeline	1957	40,000	36%	225,000	52%
Marere Pipeline	1923	7,000	6%	12,000	3%
Sabaki Pipeline	1980	48,000	44%	Over 96,000	22%
Tiwi Boreholes	1980	6,000	5%	15,000	4%
Taveta Lumi	1991	3,000	3%	75,000	17%
Others Schemes	various	6,000	5%	Over 10,000	23%
Total		110,000		430,000	

Sources: D. Chihanga, Technical Manager, Coast Water Services Board



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Values: *Key conservation area*

Scenic landscapes...



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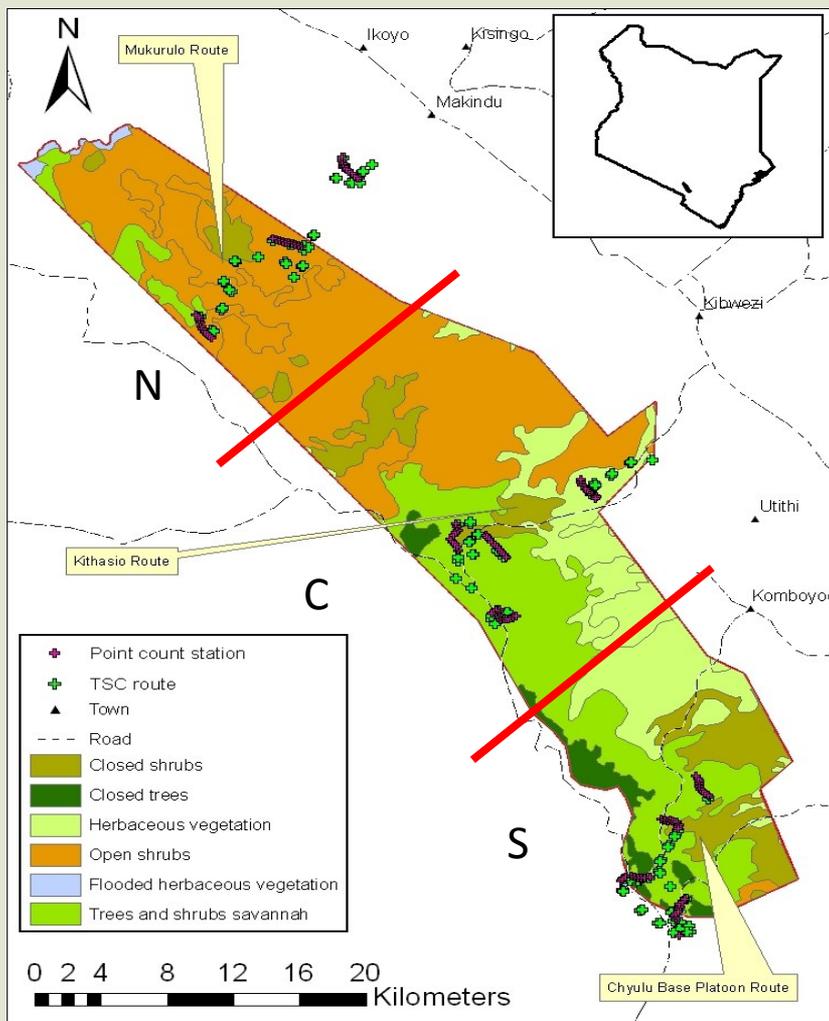
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Values: *Key biodiversity area (based on ground survey)*

Methodology



Three transects

- **Plants:** 62 plots of 20 by 20 m.
- **Birds:** 57 Timed Species Counts and 111 Point Counts.
- **Large mammals:** 13 line transects, road counts and adlib sampling methods.
- **Small mammals:** by trapping using Sherman and Tomahawk traps.

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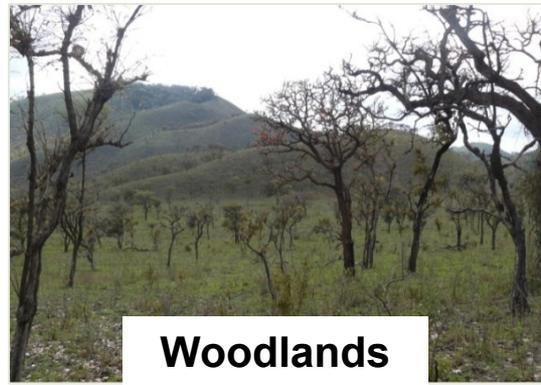


Values: *Key biodiversity area (based on ground survey)*

Diverse habitats...



Hilltop forests



Woodlands



Moist forest



Wooded lava outcrops



Grasslands



Caves

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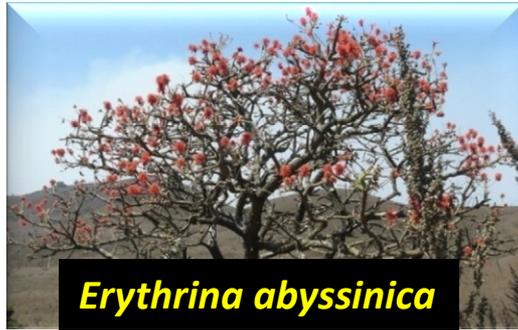
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Values: *Key biodiversity area (based on ground survey)*

Rich biodiversity: Plants

476 plant species recorded in the Chyulu Hills National Park
21 endemic and 2 rare species (IUCN Red Plant List)



Erythrina abyssinica



Cadaba farinosa



Xerophyta spekei



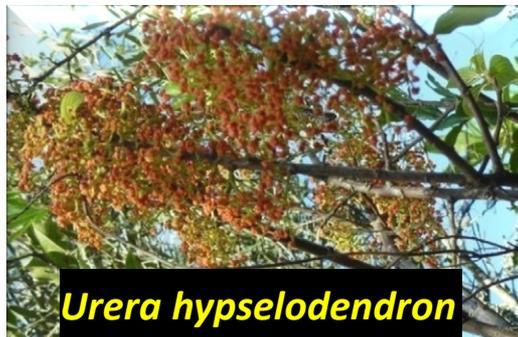
Albizia gummifera



Craterostigma pumilum



Aloe secundiflora



Urera hypselodendron



Lobelia gibberoa



Streptocarpus caulescens

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Values: *Key biodiversity area (based on ground survey)*

Important Bird Area

249 bird species recorded in the Chyulu Hills National Park
36 migrants (20 Afro-tropical, 16 Palearctic) and three near-threatened



Yellow-bellied Greenbul



Spot-flanked Barbet



White-browed Sparrow-Weaver



Red-capped Robin-Chat



Blue-eared Starling



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Values: *Key biodiversity area (based on ground survey)*

High Mammal Diversity

48 large mammals species recorded in the Chyulu Hills National Park
6 species of conservation concern, i.e. Black Rhino, African Elephant, Leopard, Lion and Cheetah



Plain Zebra



Maasai Giraffe



Klipspringer



Elephant



Black Rhino



Lion

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Values: *Key to people's livelihood*

Socio-economic status

Western side - Maasai Community

- Land tenure: communally owned;
- Main economic activity: pastoralism;
- High poverty levels.



Eastern side - Kamba Community

- Land tenure: privately owned;
- Main economic activity: subsistence farming (83%);
- High poverty levels: 15% temporary houses; 65% semi-permanent and 20% permanent houses.



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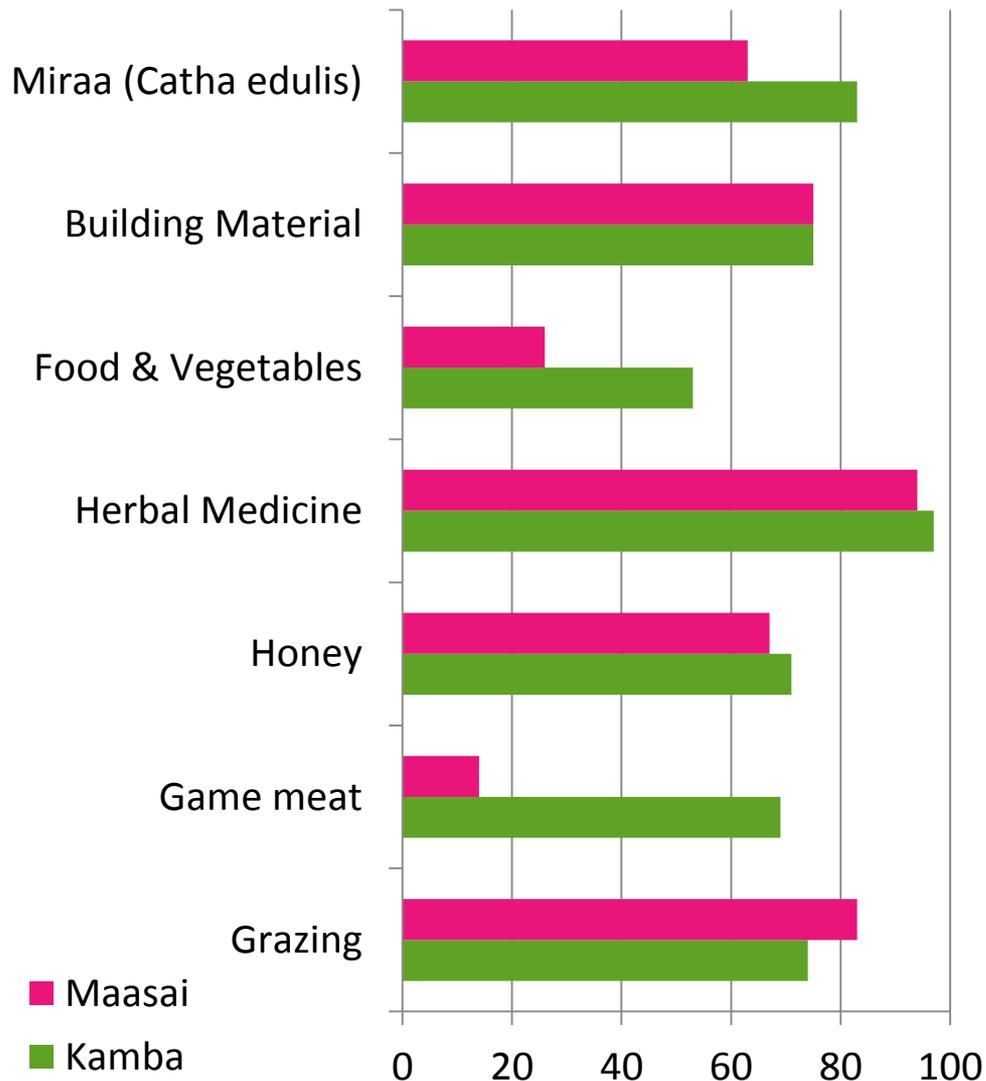
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Values: Key to people's livelihood

Resource utilization...



- Both communities rely on the Chyulu Hills for their livelihoods.
- The Hills offer alternative livelihoods e.g Miraa harvesting, charcoal burning, carving.
- Source of medicinal plants (humans and livestock).
- Maasai largely graze in Chyulu while Kamba burn charcoal, poach trees and also graze.

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Values: *communities' perceptions*

Perception: *Ecological functions*

- It's crucial water catchment - source of water for drinking and other purposes.
- The hills/forests attract rain and influence rainfall patterns.
- Harbor high diversity of flora and fauna.
- Air purification due to high forest cover.
- High bird diversity helps in seed dispersal, pollination, pest control.





Values: *communities' perceptions*

Perception: *Socio-economic contributions*

- Core resource base for the two communities.
- Source of employment.

Contributions in terms of goods...

- Alternative livelihoods e.g Miraa harvesting, charcoal burning, carving.
- Source of medicinal plants (humans and livestock).
- Critical grazing areas supporting livestock production.
- Source of food (bushmeat, honey, wild fruits and vegetables).
- Caves are associated with valuable minerals.

Contributions in terms of services....

- Cultural significance (places of traditional rituals).
- The hills are used to predict rainfall or drought.
- Offer great opportunity for tourism income.

But...

- Income generating activities in Chyulu impact negatively on education.
- Resources are exploited unsustainably. Biodiversity of the hills is declining at alarming rate.



Values: *communities' perceptions*



Perception: *Management / Conservation*

- Community feels that KWS is instrumental in the management and conservation of Chyulu Hills.
- However there is communication breakdown between the community and KWS due to:
 - unequal sharing of Park benefits (Kamba's feel left out);
 - series of forced evictions that caused bad relationship with KWS.
- Illegal activities like charcoal burning, grazing, tree poaching are detrimental to the Hills.
- Fires are degrading & reducing forest cover. Fires are due to retaliation by those arrested.
- Though willing to cultivate indigenous plants on their farms, the community cited lack of knowledge in propagating some tree species.
- The community is concerned with the increased use of power saws, especially to clear baobab.





Values: *Cultural values*



The Kamba and Maasai communities utilize the Chyulu Hills ecosystem for some cultural practices.

Most of their shrines which are considered sacred places are within the ecosystem.





Threats: *Overview based on ground survey*

Fire! Fire!



Drought



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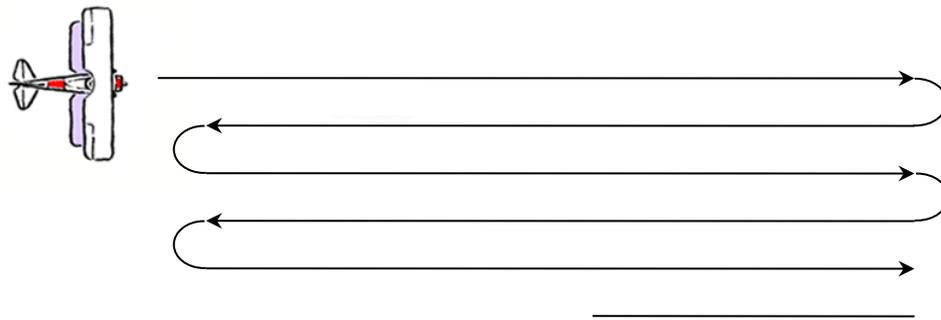
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Threats: *Extent and distribution based on aerial survey*

Methodology

The methodology of the aerial survey was derived from the long experience gained by East African wildlife departments in counting animal numbers from aircraft following set transects further adapted during the first ever forest survey of its kind in Mt. Kenya in 1999.



Flight paths of the aircraft and position of observed disturbances were recorded using a Global Positioning System (GPS) receiver. Photographs were taken of many of the observations.

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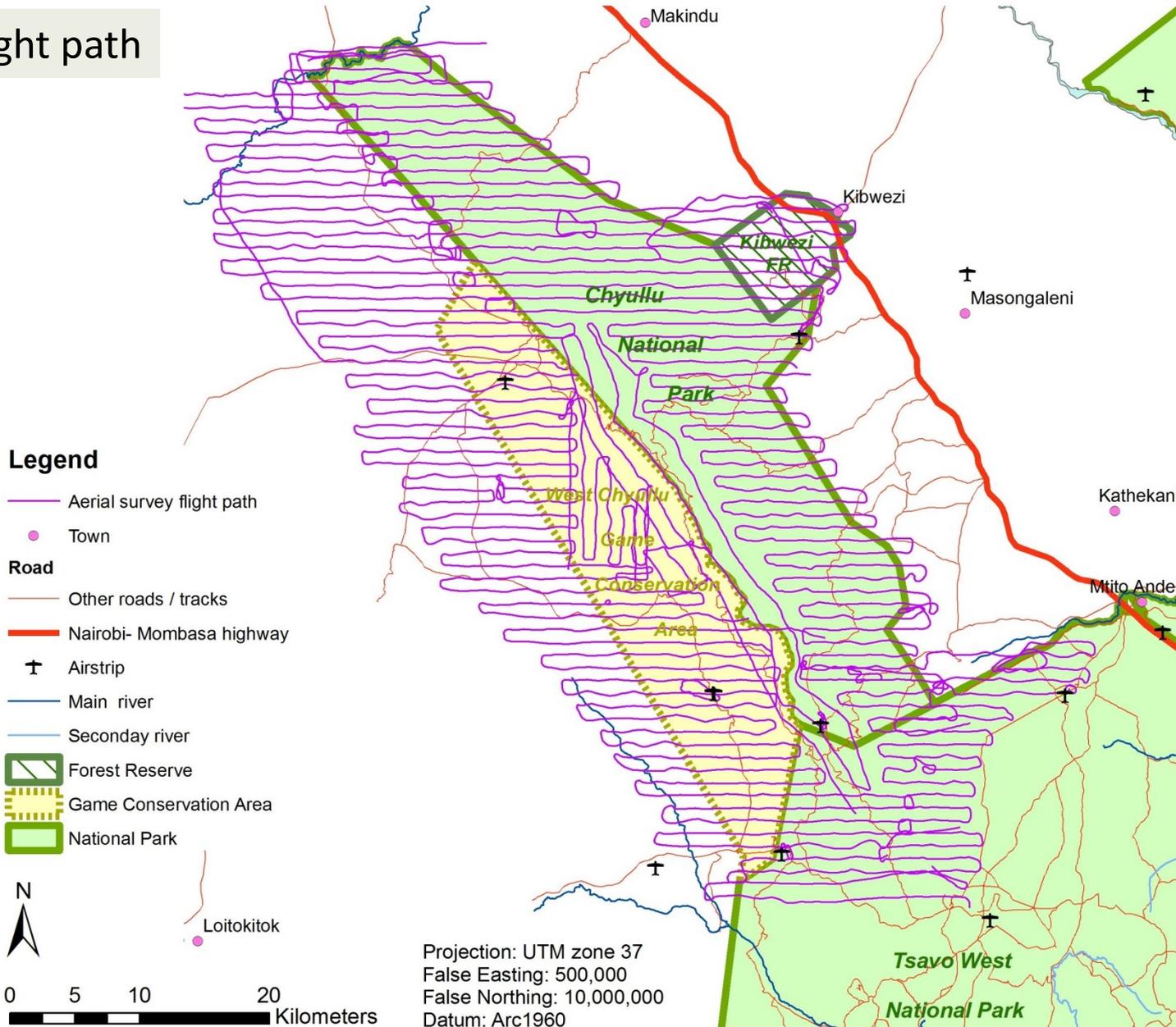
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Threats: *Extent and distribution based on aerial survey*

Flight path



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Stakeholders: *coordination*



Chyulu Hills Conservation Working Group:

Established during a stakeholder meeting held on 28 February 2011

- Objectives:
 - sharing information;
 - establishment of synergies;
 - securing ecosystem-wide approach and interventions.
- Membership:
 - conservation area managers;
 - community groups;
 - expert institutions and other stakeholders.
- Meeting: quarterly
- Secretariat: KFWG



Stakeholders: overview

Conservation area managers			
Stakeholders	Land unit	Area within the Chyulu Hills ecosystem [Ha]	Year of establishment
KWS	Chyulu Hills NP	73,295	1983 (NP)
	Tsavo West NP	approx. 40,000	1948 (NP)
KFS	Kibwezi FR	5,860	1936 (FR)
David Sheldrick Wildlife Trust			
Maasai Wilderness Conservation Trust	Kuku Group Ranch	approx. 33,000	2000 (Trust)
MaasaiLand Preservation Trust	Mbirikani Group Ranch	approx. 63,000	1993 (Trust)
Community groups			
Stakeholders	Location	Focus area	
Friends of the Chyulu	Kibwezi and Makindu Districts	Umbrella CBO; most active in the Chyulu	
Kibwezi Forest CFA	Around Kibwezi FR	Participatory management of Kibwezi FR	
Kiboko, Makindu and Kibwezi WRUAs	Three river sub-catchments	Water catchment management	
At least eight other CBOs	Eastern side of the Chyulu	Conservation, afforestation	
Expert institutions and other stakeholders			
Stakeholders	Land unit	Focus area	
Ministry of Water and Irrigation	N/A	Water resources management	
WRMA	Sub-catchments	Water resources management	
KARI	Kiboko Research Centre	Agricultural research	
National Museums of Kenya	N/A	Conservation of national heritage through research and dissemination of information	
WWF	N/A	Nature conservation	
Kenya Forests Working Group	N/A	Forest conservation	

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Stakeholders: conservation area managers

Strengths

Stakeholders	Land unit	Protected area	Existing management plan	Recent investment in infrastructure	Facilities / Equipment	Community welfare programmes	Community conservation programmes	Nature-based income-generating activities	Network
KWS	Chyulu Hills NP	YES	YES	- Road (30km) - Lodges (3 planned) - Fence (24km planned)				- 3 lodges (planned)	- Local
	Tsavo West NP	YES	YES		- Research centre - Education centre - 1 aircraft			- Well developed tourist destination	- Strong partnership with neighbouring conservation groups - International
KFS	Kibwezi FR	YES - Long-term commitment of DSWT through a 30 years lease with KFS	DRAFT	- High end lodge (Umani lodge) - 20 km fence erected - 10 km of fence about to commence	- 1 vehicle - aircraft support		- 2 desnaring/anti poaching teams (one for eastern side of Chyulu Hills NP and one for Kibwezi FR)	- High end lodge (the only tourism lodge on the eastern side of the Chyulu Hills)	- Local - International
David Sheldrick Wildlife Trust									
Maasai Wilderness Conservation Trust	Kuku GR	- Two wildlife conservancies negotiated		Chyulu Conservation & Research Centre (new MWCT headquarters and facility for researchers and partners)	- Research Centre - Community offices - Community borehole - 3 vehicles	- Compensation - Health - Education	213 employees (majority from local community): community rangers, compensation programme, wildlife monitoring, health, education and operations/management.	- Eco-lodge	- Local - International
MaasaiLand Preservation Trust	Mbirikani GR				- 1 aircraft - 2 vehicles	- Compensation - Health - Education	- 70 community scouts - Rhino programme	- Eco-lodge	- Local - International

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Stakeholders: *expert institutions and others*

Strengths

Organization	Type of organization	Core Business / Institutional Mandate	Specific expertise	Relevance	Nature of contribution	Resources
Ministry of Water and Irrigation	Government Ministry	Sustainable management and development of water resources	Water policy formulation, review and implementation	<ul style="list-style-type: none"> - Lead institution as relates to Water Sector Policy formulation, review and implementation - Legal powers under the Water Act 2002 	Technical	
Water Resources Management Authority (WRMA)	State Corporation under the Ministry of Water and Irrigation	<ul style="list-style-type: none"> - Develop principles and guidelines for the allocation of water resources - Regulate, manage and protect water resources and catchment areas 	<ul style="list-style-type: none"> - Management and development of water resources - Water PES 	<ul style="list-style-type: none"> - Legal powers under the Water Act 2002 - Lead agency in water resources management - Regional and sub-regional offices 		
NMK/IPR	Government research institution	<ul style="list-style-type: none"> - Conservation and sustainable utilization of national heritage through research and dissemination of information - Biodiversity conservation at gene, species and ecosystem level 	<ul style="list-style-type: none"> - Natural history and culture - Biodiversity resource surveys - Information dissemination (from research and collections) and conservation education - Community mobilization 	<ul style="list-style-type: none"> - Recently conducted a biodiversity assessment in Chyulu Hills ecosystem - Has build trust with the local communities - Has national coverage - Lead national institution in biodiversity research - Has unmatched diversity and experienced scientists in the field of biodiversity research 	Technical	<ul style="list-style-type: none"> - Experienced scientists who have worked in Chyulu Hills ecosystem - Some field vehicles
WWF	International organization	Nature conservation	<ul style="list-style-type: none"> - Civil society engagement - Water resource management-PES - Public-private sector partnership 	National and international coverage	Technical	Field vehicles, good mobility
KFWG	National NGO	Forests conservation	<ul style="list-style-type: none"> - PFM - Advocacy - Resource mobilization - Community mobilization 	<ul style="list-style-type: none"> - Chyulu is within its area of operation - Established advocacy and networking forum - Large membership, capacity to influence process 	<ul style="list-style-type: none"> - Secretarial support to CCWG - Technical and financial support 	<ul style="list-style-type: none"> - Finances, has on-going project with Chyulu as target - Field vehicles, good mobility

Proposed interventions



- ⇒ **Community awareness campaigns targeting especially schools, WRUAs, local barazas.**
- ⇒ **Development of alternative livelihoods, including nature-based enterprises.**
- ⇒ **Strengthening of the capacity of communities, in particular WRUAs, in the rehabilitation and conservation of water catchment areas.**
- ⇒ **Strengthening of the capacity of the conservation area managers in combatting illegal activities.**
- ⇒ **Expansion of the community scouts.**