APPENDIX I

ABERDARES NATIONAL PARK AND ABERDARES FOREST RESERVES

WILDLIFE FENCE PLACEMENT STUDY

IMPACT OF WILDLIFE FENCING ON COMMUNITIES ADJACENT TO THE ABERDARES ECOSYSTEM, KENYA

DATA FOR FENCE ALIGNMENT DECISIONS AND LONG-TERM MONITORING OF IMPACT

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RATIONAL

This portion of the Aberdares Wildlife Fence Placement Study is an assessment of the attitudes, needs, and practices of the communities surrounding the Aberdares National Park and Aberdares Forest Reserve in regard to the protected areas, the wildlife and natural resources contained therein, and the electric fence. This appendix includes the results of questionnaires given to individuals from these communities, and to KWS and Forest Department staff, discussions of community issues, and recommendations for the remaining phases of the fence project.

During this study, 384 people from 53 communities were interviewed around the perimeter of the Aberdares National Park and Aberdares Forest Reserve during about 100 days of field work.

As the cooperation and support of the surrounding communities are essential to the success of the Aberdares Wildlife Fence Project, it is necessary to understand and address the issues and concerns of the people who live and interact with the Aberdares ecosystem. It is hoped that the results of this study will (1) provide KWS and Forest Department with a better understanding of the concerns of the local communities, and (2) that this understanding will lead to widespread support for the conservation and long-term maintenance of the wildlife fence.

INTRODUCTION

One of the goals of this study is to assess the impact and potential impact of the Aberdares electric fence on the lives and attitudes of people living in the areas surrounding the Aberdares National Park and Aberdares Forest Reserve. Because so many communities live in close relation with the forest and its wildlife, it is important to understand how the fence may positively and negatively affect their lives and their attitudes towards the Aberdares Conservation Area.

Wildlife in Kenya (and indeed in many other parts of the world) has become the object of much derision, being responsible for extensive crop damage and often involved in other conflict with humans. This can lead to a general negative attitude towards wildlife and natural ecosystems as people's levels of fear are increased and wildlife is perceived as a threat to their well-being. This situation is most prevalent in and around protected areas. High concentrations of wildlife, coupled with a perception that government officials are more concerned with the protection of wildlife than with the needs of the people, makes for an uneasy relationship between communities, wildlife, and protected area staff. In some instances, the frustrations of

these communities are manifested in acts of revenge which can damage protected habitats and threaten the plant and animal populations therein.

Another aspect of the relationship between communities and protected areas is the consumptive use of natural resources. The construction of houses, fences, and other structures requires lumber and poles, and the lack of gas stoves or electricity means that people burn a large amount of fuelwood. Additionally, some livestock owners use Kenya's protected areas to graze their animals and to collect grass. These and other uses of protected areas have taken a considerable toll on the viability of that land as a habitat for wild species, and have threatened its sustainability as a resource for human consumption.

The Aberdares National Park and Aberdares Forest Reserve Wildlife Fence Project was proposed in order to reduce some of these problems. By effectively establishing boundaries, and restricting or limiting the passage of both humans and wild animals across these boundaries, it is hoped that many of these conflicts can be significantly reduced, if not resolved. Without the fear and high level of crop damage associated with a close proximity to wild animals, people in the areas surrounding the National Park and Forest Reserve will experience more stability and can come to appreciate the wildlife and ecosystems as positive aspects of their environment. By restricting and sustainable using protected area resources, future generations of both human and wildlife populations may be assured of continuing benefit from these vital ecosystems.

As the cooperation and understanding of the surrounding communities is fundamental to any conservation project, efforts must be made to assess the attitudes and relevant practices of the people most likely to be affected by, or have an effect upon, its implementation. In order to assess attitudes towards the Aberdares wildlife fence and its impact on the people of the region, members of the communities adjacent to the existing and proposed fence-lines were interviewed regarding various aspects of their relationship with the protected area and wildlife, and the impact of the fence on their lives. This section of the fence placement study provides a tabulation of the results of the interviews, a discussion of community issues, and a list of recommendations.

METHODS

To assess community attitudes towards the fence, the level of conflict with wildlife, and the level of human use of protected area resources, standardized questionnaires were administered to people living near the existing and proposed fence-lines. To

account for the differing situations of communities as concerns the current status of the fence in their area, three separate questionnaires were used. One targeted people living in areas where the fence had not yet been constructed. The responses from these communities help to assess forest use, level of conflict with wildlife, and initial reactions to the proposed fence. A second questionnaire was directed toward people living in areas where the fence had already been constructed. It was designed to assess the positive and negative impacts of the fence on people's lives and to gain insight for avoiding related problems in the future. The third questionnaire focused on the experiences and attitudes of KWS and Forest Department staff. It was given to senior staff as well as to rangers and casual labourers.

Questionnaires were conducted by way of oral interview, generally at the residence or work-place of the respondent. Along with responses to the specific questions, other information was recorded in order to better assess the subject's situation. Anecdotal experience as well as specific requests, suggestions, and comments made by the respondents were also recorded.

Flaws with Methods and other Qualifying Factors

Due to language difficulties, many of the interviews were conducted by means of an interpreter. While the interpreter was very adept and translations were generally considered to be accurate, there is always the potential for misunderstanding and miscommunication.

Many people from the communities polled appeared to have uneasy and suspicious relations with government, KWS, and Forest Department officials. Some of this may be due to inconsistency in policy, but it is also likely that some people were involved in illegal use of the protected areas and, therefore feared, retribution or changes which would restrict their illegal activities.

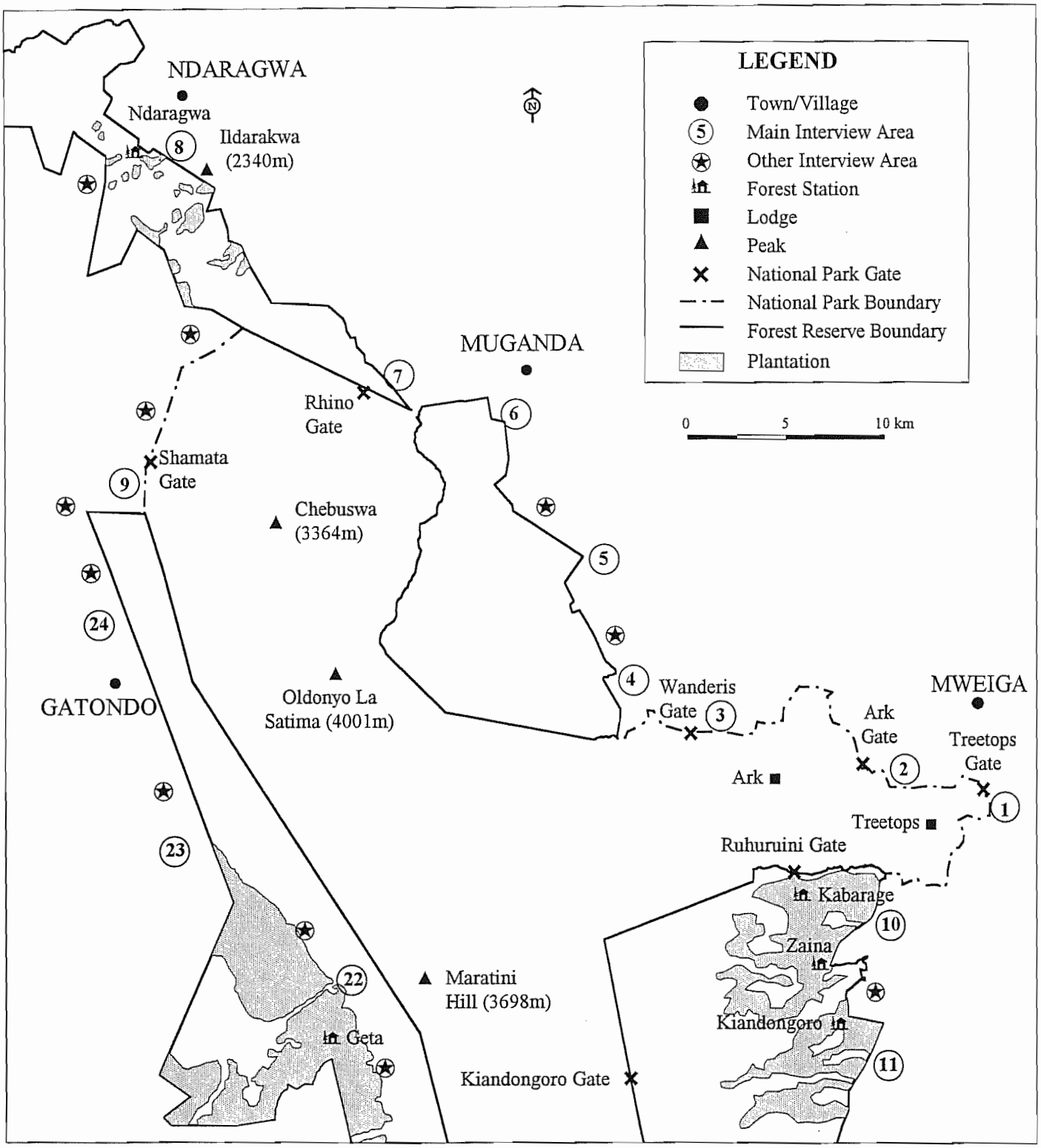
In many instances, subjects were uneasy at being asked questions regarding use of protected areas, and it is likely that the collected data do not accurately represent the amount of use. In some cases, it was necessary to infer from materials seen in the house as well as from hearsay how much use was actually occurring. It is also likely that some individuals exaggerated negative aspects of their situations in the hope of encouraging policy changes or incurring benefits.

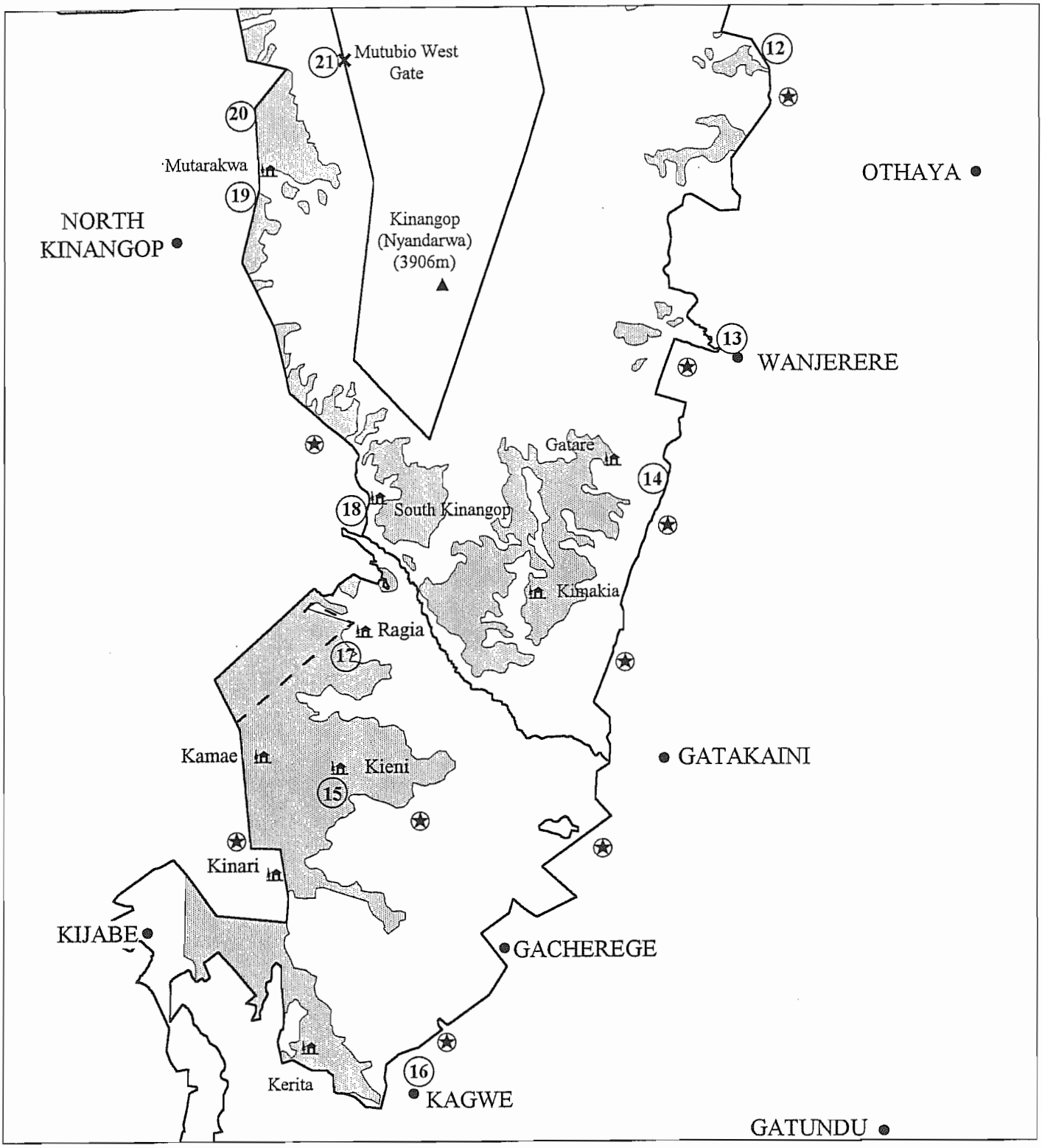
All of these factors may have affected the recorded data, and it is important to view this study with them in mind.

Table 8. Key to Map 17. Questionnaire interview sites for the Aberdares Wildlife Fence Placement Study (1997-98).

Phase	Site	Location	Villages
1	1	Treetops Gate	Njen'gu
	2	Ark Gate	Amboni, Bondene
	3	Wanderis Gate	Pura, Kihuhiro
2	4	Gakanga Gate	Gakanga
	5	Embaringo Gate	Embaringo, Watuka
	6	Magunda Gate	Mugaka, Kiambogo
3	7	Rhino Gate	Kaliki, Kiriogo
	8	Quarry	Kiriogo, Wiumiririe
	9	Shamata Gate	Shamata, Pesi
4	10	Ruhuruini Gate	Kabage
	11	Kiandogoro Gate	Kahuaga, Hubu-ini
	12	Thuti Forest Station	Itasara, Ruathini, Kihori
	13	Wanjerere Forest Station	Wanjerere, Karandi
5	14	Gatare Forest Station	Kinyona, Mununga, Wanyaga
	16	Gatamayu River Area	Kambaa, Nduiriri
6	15	Kieni Forest Station	Karunyaka, Kieni, Gakoe
	17	Ragia Forest Station	Ragia settlement
	18	S. Kinangop Forest Station	Kiburu, Holyoak
7	19	Tulaga	Mutarakwa,Mutamaiyo
	20	Kitiri	Kitiri, Kitongo
	21	Nandarasi	Nandarasi, Mutubio Gate
	22	Geta Forest Station	Geta, Mikeu
8	23	Wanjohi Area	Gatei, Gathore, Wanjohi, Rayetta
	24	Karima Area	Dosca, Karima

Map 17. **Areas where interviews were conducted in and around the Aberdares Conservation Area, Kenya (1997 - 1998). See Table 8.**




21
Mutubio West Gate
20
Mutarakwa
19
NORTH KINANGOP
Kinangop (Nyandarwa) (3906m)
12
OTHAYA
13
WANJERERE
Gatare
14
18
South Kinangop
Kimakia
Ragia
17
Kamae
Kieni
15
GATAKAINI
Kinari
KIJABE
GACHEREGE
Kerita
16
KAGWE
GATUNDU

Phase: 1 Fence status: Completed 1990
Location: Treetops Gate Village: Njen'gu

Average plot size: 2.8 ha.

Main crops: Maize, beans, potatoes, livestock.

Proximity to protected area: Bordering National Park; no Forest Reserve in vicinity.

Number of people interviewed: 9

Sex: 78% female

Age: range: 20-73 years mean: 46 years

Years on farm: range: 10-70 years mean: 32 years

Distance of farm from fence: 0-100 meters

Reduction in:

-Crop damage:	78%	-a lot	22%	-a little	0% -none
-Damage to property:	22%	-a lot	78%	-n/a (none before or since fence)	
-Loss of livestock:	33%	-a lot	67%	-n/a (none before or since fence)	

Animals most responsible for damage: Baboon, Sykes' monkey, porcupine.

Methods of protection no longer necessary: Staying outside all night, or employing someone to do so.

Current use of protected area: None. No access to National Park.

Previous informing or consultation regarding fence: 100% -no

Recommended changes to fence: Prevent raids by medium-sized mammals (baboon, Sykes' monkey, porcupine).

Attitude in regard to fence: 0% -unhappy 0% -neutral 100% -happy

Notes:
Individuals interviewed (and by inference, the community in general) are very positive about the fence. As the community sits on the border of a National Park, access never been allowed, indicating that the fence is denying law abiding citizens of nothing and proving to be of enormous benefit to those raising crops. While Sykes' monkeys, baboons, and porcupines continue to be a problem, the near cessation of raids by larger mammals is proving to be of financial and social benefit to the entire community.

People report that the fence is well maintained and that any damage to it is quickly reported and repaired.

Phase: 1
Location: Ark Gate

Fence status: Completed in 1990
Village: Amboni, Bondene

Average plot size: 2.8 ha.

Main crops: Maize, beans, potatoes, livestock.

Proximity to protected area: Bordering National Park; no Forest Reserve in vicinity.

Number of people interviewed: 16

Sex: 36% male

Age: range: 20-72 years mean: 44 years

Years on farm: range: 11-37 years mean: 31 years

Distance of farm from fence: 0-700 meters

Reduction in:

-Crop damage:	50%	-a lot	50%	-a little	0% -none
-Damage to property:	0%	-a lot	100%	-n/a (none before or since fence)	
-Loss of livestock:	75%	-a lot	25%	-n/a (none before or since fence)	

Animals most responsible for damage: Baboon, Sykes' monkey, porcupine.

Methods of protection no longer necessary: Sleeping outside and maintaining constant guard.

Current use of protected area: None. No access to National Park.

Previous informing or consultation regarding fence: 31% -yes

Recommended changes to fence: Prevent raids by medium-sized mammals (baboon, Sykes' monkey, porcupine). One individual requested access to the National Park for Fuelwood.

Attitude in regard to fence: 0% -unhappy 0% -neutral 100% -happy

Notes:
People appear to be generally very positive regarding the fence. The fence is reducing crop damage as well as fear and the necessity of constant vigilance. People expressed appreciation of the fence as they are now able to grow larger and more diverse crops. People are encouraged by the timely fashion in which damage is repaired. There are universal complaints about the continuing problem with Sykes' monkeys and other medium-sized mammals.

Phase: 1 | Fence status: Completed in 1990
Location: Wanderis Gate | Village: Pura, Kihuhiro

Average plot size: 2.8 ha.

Main crops: Maize, beans, potatoes, livestock.

Proximity to protected area: Bordering National Park; no Forest Reserve in vicinity.

Number of people interviewed: 12

Sex: 75% male

Age: range: 24-62 years mean: 43 years

Years on farm: range: 3-34 years mean: 23 years

Distance of farm from fence: 5-20 meters

Reduction in:

-Crop damage:	83%	-a lot	17%	-n/a (arrived after fence)
-Damage to property:	17%	-a lot	83%	-n/a (none before or since fence)
-Loss of livestock:	58%	-a lot	42%	-n/a (none before or since fence)

Animals most responsible for damage: Baboon, Sykes' monkey, porcupine.

Methods of protection no longer necessary: Lighting fires and sleeping outside.

Current use of protected area: None. No access to National Park.

Previous informing or consultation regarding fence: 100% -no

Recommended changes to fence: Prevent raids by medium-sized mammals (baboon, Sykes' monkey, porcupine).

Attitude in regard to fence: 0% -unhappy 8% -neutral 92% -happy

Notes:
Respondents were generally very positive. The only individual expressing a 'neutral' opinion of the fence moved to the location after the fence was in place and, therefore, had no reference from which to compare. Most individuals note a positive change to the quality of their lives and their ability to produce more and better crops. As in other areas, there is a universal complaint regarding Sykes' monkeys and other medium-sized mammals. There were no reports of damage or of larger mammals coming through the fence. The fence posts in this area are noticeably weak, however.

One respondent requested access to the National Park for fuelwood and water.

Phase: 1 Fence status: Completed 1990
Sample: KWS employees

Staff members of KWS were questioned regarding various aspects of the fence, the community, and the relationship between people and the protected area. Much of the information from these interviews is incorporated into the specific location results on the preceding pages.

Number of people interviewed: 7

Sex: 100% male

Age: range: 26-46 years mean: 33 years

Years in position: range: 0.25-25 years mean: 7 years

Reduction in:
-Crop damage: 100% -a lot
-Damage to property: 100% -a lot
-Loss of livestock: 100% -a lot
-Others: reduced possibility of diseases transmission between wildlife and domestic animals; rangers report more effective and efficient patrolling of areas.

Animals most responsible for damage: Sykes' monkey, porcupine, bush pig.

Reduction in protected area use of:

-Fuel-wood:	57% -a lot	43% -a little
-Lumber:	57% -a lot	43% -a little
-Poles:	57% -a lot	43% -a little
-Other:	57% -a lot	43% -a little

Is the fence properly maintained: 100% -yes

Are access gates properly monitored: n/a (area is National Park -no access for taking resources allowed)

Recommended changes to fence: Stronger materials and construction; prevent medium-sized mammals from getting through; more community involvement and interaction.

Opinion of fence: 100% -good

Perceived community opinion of fence: 100% -good

Phase: 2 | Fence status: Completed in 1990
Location: Gakanga Gate | Village: Gakanga

Average plot size: 2.2 ha.
Main crops: Maize, cabbage, potatoes, livestock.

Proximity to protected area: Bordering Forest Reserve boundary. Before the fence there appears to have been seemingly unrestrained use of forest resources with encroachment extending to National Park boundary. In addition to farm plots, there are a number 0.1 -0.2 ha plots owned, borrowed, or rented by individuals and families evicted from farms previously (illegally) within the Forest Reserve.

Number of people interviewed: 14 (does not include evictees)

Sex: 64% male
Age: range: 30-68 years mean: 48 years
Years on farm: range: 13-22 years mean: 19 years

Distance of farm from fence: 0-800 meters

Reduction in:

-Crop damage:	100% -a lot	0% -a little	0% -none
-Damage to property:	71% -a lot	29% -n/a (none before or since fence)	
-Loss of livestock:	79% -a lot	21% -n/a (none before or since fence)	

Animals most responsible for damage: Sykes' monkey, porcupine.

Methods of protection no longer necessary: Lighting fires, sleeping outside, and praying.

Current use of protected area:

-Fuelwood:	93% -a lot	0% -a little	7% -none
-Grass for livestock:	86% -a lot	0% -a little	14% -none

Previous informing or consultation regarding fence: 64% -yes

Recommended changes to fence: Prevent raids by medium-sized mammals (baboons, Sykes' monkey, porcupines).
Attitude in regard to fence: 0% -unhappy 7% -neutral 93% -happy

Notes:
Of the individuals interviewed who had been residing in the area for some time and had farms, the attitude toward the fence is generally positive. Everyone agrees that the fence has greatly reduced the amount of conflict with wildlife, improving their chances for successful cultivation. Some people complained that the level of access to forest is not enough, and a few commented that they would prefer being allowed to graze cattle rather than having to collect grass. Some respondents note difficulty in reporting problems with the fence, citing distance to the reporting point as a problem. It is difficult to assess how well access gates are monitored. Poaching of poles was witnessed.

Phase: 2 | Fence status: Completed in 1994
Location: Gakanga Gate | Village: Gakanga

The results tabulated here are taken from questionnaires and discussions with individuals, residing in Gakanga, were evicted from farms that were (illegally) within Forest Reserve boundaries. With only a few exceptions, the evictees were now residing on borrowed or rented 0.1 ha lots, with little or no cultivation and only a small amount of livestock. Many reported having lived within the Forest Reserve boundary for more than 10 years before being evicted in 1994.

Number of people interviewed: 7 (evictees)

Sex: 71% female

Age: range: 34-70 years mean: 46

Distance of plot from fence: 50-500 meters

Reduction in damage caused by wildlife: (drastic change caused by eviction made this difficult to assess). Only one respondent reported still having crops. Reported a large reduction in damage since the building of the fence.

Current use of protected area:

-Fuel wood:	78%	-a lot	0%	-a little	22%	-none
-Grass for cattle:	44%	-a lot	0%	-a little	56%	-none

Attitude in regard to fence: 78% -unhappy 0% -neutral 22% -happy

Notes:
Of the evictees interviewed, the majority are bitter and generally displeased with the placement of the fence. Though most understand that been illegally settled within Forest Reserve boundaries, most cite the inconsistent actions of the government and the lack of anywhere else to go as reasons for staying. While some agreed that the fence is serving a valuable purpose, all the evictees would prefer having been left to cultivate the land. All respondents claim that the amount of access to the forest presently afforded them is not enough (though some admit to not using it at all) and complained about their treatment. Behind the complaining, however, there appears to be an understanding of both their misuse of the Forest Reserve and the valuable purpose served by the fence.

Opinions offered by the 'non-evictee' residents of Gakanga regarding the eviction of encroachers cover a wide range. While some expressed appreciation of the protection of the forest and for the evidence of "law and order," others commented on the apparent inconsistency of government policy and the harshness with which evictees had been treated.

Phase: 2 | Fence status: Completed in 1994
Location: Embaringo and Watuka Gates | Village: Emabaringo, Watuka

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Average plot size: 20 ha.
Main crops: Maize, beans, wheat, livestock.

Proximity to protected area: Bordering Forest Reserve. Generally larger and wealthier farms than those found just a few kilometres to the southeast.

Number of people interviewed: 7
Sex: 43% male
Age: range: 18-43 years mean: 34 years
Years on farm: range: 5-32 years mean: 17 years
Distance of farm from fence: 5-250 meters
Distance of farm from gate: 5-450 meters

Reduction in:
-Crop damage: 100% -a lot 0% -a little 0% -none
-Damage to property: 71% -a lot 29% -n/a (none before or since fence)
-Loss of livestock: 100% -a lot 0% -a little 0% -none
Animals most responsible for damage: Baboon, Sykes' monkey.

Methods of protection no longer necessary: Lighting fires and sleeping outside.

Current use of protected area: (Note: Watuka Gate is not an access gate)
-Fuel wood: 43% -a lot 0% -a little 57% -none
-Grass for cattle: 43% -a lot 0% -a little 57% -none

Previous informing or consultation regarding fence: 29% -yes
Recommended changes to fence: Prevent raids by medium-sized mammals (i. e. baboon, Sykes' monkey).

Attitude in regard to location of gates: (of those given access) 100% -happy
Attitude in regard to amount of access to forest: (of those given access) 67% -happy 23% -unhappy
Attitude in regard to fence: 0% -unhappy 29% -neutral 71% -happy

Notes:
Generally positive in regard to the fence, and some expressed recognition of the compromise granting protection to crops at the cost of limited access to the Forest Reserve. Many had previously used the forest extensively for grazing livestock and taking fuelwood. Restriction of this use may account for some of the less enthusiastic responses. Some respondents commented on the fact that, prior to the erection of the fence, they were seriously limited as to where they could cultivate and what crops they could grow. The placement of the fence has essentially increased the usable size of some individuals' property, allowing them to cultivate much closer to the forest boundary.

Phase: 2 | Fence status: Completed in 1994
Location: Mugunda Gate | Village: Mugaka, Kiambogo

Average plot size: 2 ha.

Main crops: Maize, potatoes, pyrethrum, livestock.

Proximity to protected area: Bordering Forest Reserve. Before the construction of the fence, people in this area used the Forest Reserve to graze cattle as well as to collect Fuelwood and other resources.

Number of people interviewed: 6

Sex: 66% Male

Age: range: 18-59 years mean: 32 years

Years on farm: range: 18-45 years mean: 26 years

Distance of farm from fence: range: 15-300 meters

Reduction in:

-Crop damage:	0%	-a lot	16%	-a little	84% -none
-Damage to property:	100%	-n/a (no damage before or since fence)			
-Loss of livestock:	66%	-a lot	17%	-a little	16% -none

Animals most responsible for damage: Elephant, baboon.

Methods of protection no longer necessary: All claimed having to still light fires and sleep outside.

Current use of protected area: As neither the Mugunda Gate nor the Belle View Gate were yet open to community access, all reported no use of forest resources.

Previous informing or consultation regarding fence: 33% -none

Recommended changes to fence: Allow access for grazing livestock; move fence to National Park boundary; remove fence altogether.

Attitude in regard to proposed fence:

83% -unhappy	17% -neutral	0% -happy

Notes:
People in this area are generally negative toward the fence, and seem very distrustful of interviewers. Excepting the noticeably understated reduction in loss of livestock due to wild animals, individuals had nothing positive to say about the fence. They contend that the fence not only limits their grazing of livestock and gathering of fuelwood and other necessary resources, but that it actually has increased the

level of crop damage by elephants. While the level of elephant presence may be exaggerated due to frustration with the fence in general, it is possible that elephants are attempting to utilize a traditional migration route and are blocked by the fence. The proximity of this area to an unfinished section of fence may also be a factor in the number of wild animals still present. All of those interviewed were demonstrably unhappy with the lack of access to the Forest Reserve. They report having "nowhere" to graze (though it is important to note that individuals with approximately 1 hectare of cultivated land have 10-15 cattle), and great difficulty in gathering needed resources. It is interesting that the KWS fence maintenance staff member who was interviewed at the gate reported a great reduction in crop damage in the area and a generally positive attitude of the community toward the fence.

Phase: 2 Fence status: Completed 1994
Sample: KWS employees

Staff members of KWS were questioned regarding various aspects of the fence, the community, and the relationship between people and the protected area. Much of the information from these interviews is incorporated into the specific location results on the preceding pages.

Number of people interviewed: 4

Sex: 100% male

Age: range: 25-38 years mean: 31

Years in position: range: 0.3-5 years mean: 1.5 years

Reduction in:
-Crop damage: 50% -a lot 25% -a little 25% -unable to assess
-Loss of livestock: 75% -a lot 25% -unable to assess

Animals most responsible for damage: Baboons, Sykes' monkey, elephant.

Reduction in protected area use of:
-Fuel-wood: 25% -a lot 50% -a little 25% -unable to assess
-Lumber: 75% -a lot 25% -unable to assess
-Poles: 75% -a lot 25% -unable to assess
-Other: grazing is no longer permitted; encroachment is no longer a problem.

Is the fence properly maintained: 100% -yes

Are access gates properly monitored: 75% -yes 25% -no

Recommended changes to fence: Finish fence to the north; stop baboon and Sykes' monkey.

Opinion of fence: 100% -good

Perceived community opinion of fence: 100% -good

Phase: 3 | Fence status: Completed in 1994
Location: Rhino Gate | Village: Kaliki, Kiriogo

Average plot size: 2.8 ha.

Main crops: Maize, beans, potatoes, livestock.

Proximity to protected area: Bordering Forest Reserve. Access gate to Forest Reserve has just recently been opened to public use by those with permits. Most of those interviewed had yet to acquire permits. Completed fence ends within a few kilometres of these communities.

Number of people interviewed: 14

Sex: 42% female

Age: range: 18-80 years mean: 40 years

Years on farm: range: 3-18 years mean: 12 years

Distance of farm from fence: 150-1000 meters

Distance of farm from gate: 200-1000 meters

Reduction in:

-Crop damage:	0% -a lot	35% -a little	65% -none
-Damage to property:	0% -a lot	100% -n/a (none before or since fence)	
-Loss of livestock:	57% -a lot	43% -n/a (none before or since fence)	

Animals most responsible for damage: Elephant, Sykes' monkey, porcupine.

Methods of protection no longer necessary: Only some reduction in the amount of vigilance and fires needed.

Current use of protected area:

-Fuel wood:	50% -a lot	7% -a little	43% -none
-Grass/grazing:	50% -a lot	7% -a little	43% -none
-Water	50% -a lot	7% -a little	43% -none

Previous informing or consultation regarding fence: 29% -yes

Recommended changes to fence: Allow more access to grazing land and water during drought. Move fence-line "closer to National Park boundary to allow buffer zone" (?) for migrating elephants. Stop Sykes' monkeys and baboons from getting over fence.

Attitude in regard to location of gates: (of those who utilized access gates) 100% -happy

Attitude in regard to amount of access to protected area: (of those who utilized access gates) 100% -happy

Attitude in regard to fence:
43% -unhappy 14% -neutral 43% -happy

Notes:
There are a number of factors which make assessment of community attitudes and practices in this area difficult. Due to the proximity to the unfinished portion of the fence, the effective impact of fencing cannot be adequately measured. Indeed, many individuals complain of an actual increase in elephant presence since the construction of the fence, pointing out that the fence is blocking elephants who had come out from other areas or from surrounding ranches from returning to the forest. Also, there appears to have been extensive and unrestricted use of Forest Reserve land before the erection of the fence, and the new limitations and restrictions have many people feeling denied. Having previously used the forest freely, many people complain about the limitations and expense of access permits. Some admit to going to areas where the fence is not yet in place to obtain resources and graze livestock, in order to avoid paying access fees.

There is apparently an area nearby where elephants congregate to get salt. This, coupled with the area's proximity to ranches and migration routes between the Aberdares and Mt. Kenya, makes for a higher concentration of elephants outside the Forest Reserve. Elephant presence is reportedly increased during the wet seasons.

Some people noted a need to reduce their cattle due to lack of access to grazing land. With access to grazing areas within the Forest Reserve, it was possible to have considerably more livestock than one's own property could sustain. People may now be moving toward having a number of livestock congruent with their area of pasture. While there has been encouragement to plant trees on private land to reduce dependence on forest resources, there is only a little evidence that this is being practiced.

There was a noticeable lack of trust of officials by many of those interviewed. It can be inferred that those who are involved in illegal use of protected area resources are in conflict with KWS and Forest Department officials. This factor, along with some general discontent with the limitation of use of forest resources, may have coloured some individuals' responses to the questionnaire. These data should be viewed with this in mind.

Phase: 3 | Fence status: Proposed (clearing completed)
Location: Quarry | Village: Kiriogo, Wiumiririe

Average plot size: 1.8 ha.
Main crops: Maize, beans, livestock.
Proximity to protected area: Bordering Forest Reserve. A combination of drought, poor productivity, and limited resources makes these communities somewhat poorer than others nearby.

Number of people interviewed: 8
Sex: 63% female
Age: range: 25-65 years mean: 43 years
Years on farm: range: 4-19 years mean: 11 years

Problems with wildlife:

-Crop damage:	100% -a lot	0% -a little	
-Damage to property:	0% -a lot	13% -a little	87% -none
-Loss of livestock:	13% -a lot	13% -a little	74% -none

-Others: Stress caused by fear. Loss of sleep and freedom of mobility.
Animals most responsible for damage: Elephant, baboon, antelope, warthog.

Methods of protection currently used: Sleeping outside, making noise, lighting fires.

Current use of protected area:

-Fuel wood:	87% -a lot	13% -a little	0% -none
-Grazing:	87% -a lot	0% -a little	13% -none
-Water	100% -a lot	0% -a little	0%- none
-Lumber:	0% -a lot	13% -a little	0% -none

Previous informing or consultation regarding fence: 50% -none
Attitude in regard to proposed fence: Most individuals expressed positive attitudes toward the proposed fence, but strongly qualified this with the need of access to forest resources.

Notes:
People seem generally positive about the proposed fence and its potential for decreasing the amount of wildlife conflict, but are adamant about the necessity of continued access to forest resources. As most people report paying for access permits at present, an access gate enforcing paid protected area use should result in little change for those who are obeying the law. Those who would be compromised by the change are those who are presently taking more than the legal amount of resources, taking prohibited resources, or accessing the Forest Reserve without paying for permits. While residents report depending on the Forest Reserve for a number of resources, water is uncontestably the most important. Individuals report that the nearest source of water outside of the Forest Reserve is many hours walk away. Fuelwood was also mentioned as a primary forest resource for which people would require access. There appears to be a considerable amount of grazing land and trees left outside the proposed fence-line.

Phase: 3 Fence status: Proposed (clearing completed)
Location: Shamata Gate Village: Shamata, Pesi

Average plot size: 3.6 ha.

Main crops: Maize, beans, potatoes, livestock.

Proximity to protected area: Bordering Forest Reserve and National Park.

Number of people interviewed: 26

Sex: 46% male

Age: range: 25-60 years mean: 42 years

Years on farm: range: 1-35 years mean: 24 years

Problems with wildlife:

-Crop damage:	100% -a lot	0% -a little	0% -none
-Damage to property:	0% -a lot	12% -a little	88% -none
-loss of livestock:	15% -a lot	69% -a little	12% -none

-Others: Stress caused by fear. Loss of sleep and freedom of mobility.

What animals are mainly responsible for damage: Elephant, lion, baboon, antelope.

Methods of protection currently used: Sleeping outside, making loud noises, and lighting fires.

Current use of protected area: (note: percentages also include those along National Park boundary, most of whom report not using forest land at all)

-Fuel wood:	35% -a lot	0% -a little	65% -none
-Water:	23% -a lot	0% -a little	77% -none
-Grazing:	23% -a lot	0% -a little	77% -none

Previous informing or consultation regarding fence: Most had only heard rumours or been told by workers clearing for fence.

Attitude in regard to proposed fence:
4% -unhappy 8% -neutral 88% -happy

Notes:
People interviewed in this area are generally positive about the proposed fence and its potential for reducing wildlife conflict. Many expressed frustration with the amount of time between clearing and the building of the fences, noting that clearing has filled in parts of the existing moat, making their farms more accessible to wild animals. Those whose farms border on the Forest Reserve (and even some of those bordering on the National Park) expressed desire to continue present

levels of use of the protected area resources, citing Fuelwood, water, and land for grazing as primary needs. Some admit to using the Forest Reserve without paying for permits, and some to poaching poles and lumber. These individuals obviously have something to lose by the construction of the fence.

It is important to note that forest use (both National Park and Forest Reserve) in this area is extensive. On numerous occasions during the brief visit to the area, cattle were seen grazing in the National Park and some individuals reported gathering posts and Fuelwood from within the park. Of those people living adjacent to the Forest Reserve, almost all report using the forest (primarily for fuelwood, water, and grazing livestock) and a desire for this use to continue in some manner. The village of Pesi in particular reports the dire need for access to the National Park to get water. There appears to be a slow but burgeoning improvement in the relationship between the communities and KWS. Conservation education, meetings with local leaders, participation in community affairs and the willingness of KWS to contribute to various endeavours (schools, roads, tourist lodge, etc.) have begun to have a positive influence on people's attitudes towards KWS and the National Park. However, there is still an element of friction that exists. This is particularly so between authorities and those who are benefiting from illegal use of forest resources. Some people report bribing officials for access to restricted forest resources, while others report being allowed (only occasionally during drought) access to the National Park.

The recent rash of fires throughout the Aberdares Conservation Area may be largely a result of these conflicts.

Phase: 3 Fence status: Proposed (clearing completed)
Sample: KWS employees

Staff members of KWS were questioned regarding various aspects of the fence, the community, and the relationship between people and the Aberdares Conservation Area. Much of the information from these interviews is incorporated into the specific location results on the preceding pages.

Number of people interviewed: 6

Sex: 83% male

Age: range: 26-45 years mean: 37

Years in position: range: 0.75-10 years mean: 3.5 years

What is the level of:

-Crop damage:	100% -a lot	0% -a little	0% -none
-Damage to property:	66% -a lot	0% -a little	34% -none
-Loss of livestock:	17% -a lot	66% -a little	17% -none

Animals most responsible for damage: Elephant, porcupine, bush pig, monkeys.

What is the level of use of:

-Fuel-wood:	100% -a lot	0% -a little	0% -none
-Lumber:	83% -a lot	0% -a little	17% -none
-Poles:	83% -a lot	0% -a little	17% -none

-Others: grazing, water, honey.

Opinion of fence: 100% -good

Perceived community opinion of fence: 50% -good 33% -neutral 17% -bad

Notes:
-Community requires access to Forest Reserve for resources.
-Appreciative of development aspect of fence.
-Prospect of new lodge with revenue opportunities for community.
-Expressed dire need for community education and cooperation.
-Problems with crop raiding by animals have increased since the clearing of the fence.

Phase: 4 Fence status: Proposed (clearing completed)
Location: Ruhuruini Gate Village: Kabage

Average plot size: 0.6 ha shambas

Main crops: Maize, beans, cabbage, potatoes.

Proximity to protected area: Bordering and within Forest Reserve. The Shamba System is in practice, though level of enforcement is unclear.

Number of people interviewed: 16
Sex: 88% male
Age: range: 16-43 years mean: 30 years
Years on farm: range: 0.8-4 years mean: 2 years

Problems with wildlife:

-Crop damage:	75% -a lot	25% -a little	0% -none
-Damage to property:	18% -a lot	13% -a little	69% -none
-Loss of livestock:	18% -a lot	82% -n/a (no livestock)	

-Others: Stress caused by fear. Loss of sleep and freedom of mobility.

Animals most responsible for damage: Elephant, buffalo, baboon, antelope (bushbuck and waterbuck).

Methods of protection currently used: Fire, loud noise, dogs, sleeping outside, spears, and stones.

Current use of protected area:

-Fuel wood:	87% -a lot	0% -a little	13% -none
-Poles:	94% -a lot	0% -a little	6% -none
-Medicinal plants:	0% -a lot	25% -a little	75% -none

-Others: water, honey, fruit, game, grazing pasture.

Previous informing or consultation regarding fence: 100% -no

Attitude in regard to proposed fence:
38% -unhappy 37% -neutral 25% -happy

Notes:
There appears to be a general lack of trust in regard to the interviewers by many of those interviewed. It can be assumed that some respondents are understating the amount of protected area use. It should be noted that all of the individuals who expressed themselves as "unhappy" with the proposed fence are those whose plots fall within the fence-line and would therefore be losing land when the fence is constructed. Having had no prior information or consultation regarding the fence, subjects did not really seem to understand the purpose or potential impact of the fence. Those who understood that it was likely to reduce the problems associated with wildlife were very positive.

Phase: 4 Fence status: Proposed
Location: Kiandogoro Gate Village: Kahuaga, Hubu-ini

Average plot size: 2.8 ha with 0.2 -0.4 ha shambas.

Main crops: Maize, beans, potatoes, livestock.

Proximity to protected area: Bordering and within Forest Reserve.

Number of people interviewed: 11

Sex: 73% male
Age: range: 18-55 years mean: 34 years
Years on farm: range: 1-55 years mean: 9 years

Problems with wildlife:

-Crop damage:	82% -a lot	18% -a little	0% -none
-Damage to property:	0% -a lot	9% -a little	91% -none
-Loss of livestock:	18% -none	82% -n/a (no livestock)	

-Others: Stress caused by fear. Loss of sleep and freedom of mobility.

Animals most responsible for damage: Elephant and buffalo.

Methods of protection currently used: Fires, noise, and patrol during harvest.

Current use of protected area:

-Fuel wood:	100% -a lot	0% -a little	0% -none
-Lumber:	0% -a lot	18% -a little	82% -none

-Others: grazing livestock and cultivation through the Shamba System.

Previous informing or consultation regarding fence: 91% -no
Attitude in regard to proposed fence:
0% -unhappy 18% -neutral 82% -happy

Notes:
All of the respondents qualified their reactions to the fence by stating that they would like to be assured that the fence will either be placed along the National Park boundary, or that they will have continued access to Forest Reserve land and resources. Due to the existence of shambas within the Forest Reserve, and the amount of legal and illegal consumption of forest products, people are concerned about the possibility that the fence will restrict these uses. There is evidence that people are capable of obtaining materials without going into the protected area: a few respondents have been planting exotic trees on their own property, while some report purchasing supplies from others. Although there is reported to have been a meeting to discuss issues about the fence, few people in these communities report having heard more than rumours. People report the need for more information regarding the fence and its potential impact, and wanted to know what sort of employment opportunities its development will yield.

Phase: 4 Fence status: Proposed
Location: Thuti Forest Station Village: Itarara, Ruathini, Kihori

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Average plot size: 1.6 ha with 0.2 -0.4 ha shambas.

Main crops: Tea, maize, beans, potatoes, livestock.

Proximity to protected area: Bordering Forest Reserve.

Number of people interviewed: 10

Sex: 80% male

Age: range: 28-70 years mean: 42 years

Years on farm: range: 6-60 years mean: 32 years

Problems with wildlife:

-Crop damage:	50% -a lot	40% -a little	10% -none
-Damage to property:	0% -a lot	0% -a little	100% -none
-Loss of livestock:	0% -a lot	0% -a little	100% -none

Animals most responsible for damage: Elephant, Sykes' monkey, bush pig.

Methods of protection currently used: Noise, sleeping at shambas during harvest.

Current use of protected area:

-Fuel wood:	100% -a lot	0% -a little	0% -none

-Others: grazing livestock, water, and cultivation (Shamba System).

Previous informing or consultation regarding fence: 40% -yes

Attitude in regard to proposed fence:

0% -unhappy 40% -neutral 60% -happy

Notes:
People report that the problems with wildlife are generally restricted to within the Forest Reserve, and most of these are seasonal raids by elephants on the shamba crops. There are reportedly few or no problems with animals outside of the Forest Reserve. Most people using the forest for grazing, gathering fuelwood, or cultivation claim to go into the Forest Reserve 2-4 km from the boundary. As wildlife does not seem to constitute a major problem for these people, their main concern is the fence's impact on their use of Forest Reserve resources. Individuals reported buying lumber from the Forest Reserve and having water piped in from the forest to their homes, leaving their biggest concerns the gathering of fuelwood, grazing, and cultivation of Forest Reserve land. However, in this area, the present proposed fence-line is more than 4 km from the Forest Reserve boundary, and would therefore have little or no effect on these practices.

Phase: 4 Fence status: Proposed
Location: Wanjerere Forest Station Village: Wanjerere, Karandi

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Average plot size: 2 ha.
Main crops: Tea, maize, beans, potatoes, livestock.

Proximity to protected area: Bordering Forest Reserve. There is no Shamba System being practiced in this area, but the Nyayo Tea Zone is in clear evidence along the Forest Reserve boundary. These communities appear to be far wealthier than many of the others interviewed along the fence-line.

Number of people interviewed: 10
Sex: 70% male
Age: range: 25-65 years mean: 39 years
Years on farm: range: 4-65 years mean: 31 years

Problems with wildlife:

-Crop damage:	20% -a lot	40% -a little	40% -none
-Damage to property:	0% -a lot	0% -a little	100% -none
-Loss of livestock:	0% -a lot	30% -a little	70% -none

Animals most responsible for damage: Elephant, Sykes' monkey, hyaena.
Methods of protection currently used: Noise to frighten animals away.

Current use of protected area:

-Fuel wood:	70% -a lot	0% -a little	30% -none

-Others: grazing livestock.

Previous informing or consultation regarding fence: 90% -no

Attitude in regard to proposed fence:
0% -unhappy 20% -neutral 80% -happy

Notes:
People in this area benefit considerably from the cultivation and sale of tea. There seem to be higher grades of housing, clothing, and basic facilities. There were few reported problems with wildlife and use of the Forest Reserve seems to be limited to grazing and gathering of fuelwood. People are positive in general about the fence, though some are concerned about the continuation of grazing within the Forest Reserve. Those who use the Forest Reserve to graze livestock report going in 2-4 km from the boundary.

Forest Department in this area annually gives out free seedlings on a first-come first-serve basis. Most people reported getting 2-3 seedlings (though some received as many as 50). This practice, if encouraged and developed, could help to reduce the dependence on the Forest Reserve for wood. Respondents reported that the Nyayo Tea Zone is poorly managed and that workers are not paid or treated well. The Nyayo Tea Zone should be an opportunity for individuals to benefit economically from the forest in a sustainable manner, reducing the need to exploit other Forest Reserve resources.

Phase: 4 Fence status: Proposed
Sample: KWS and Forest Department employees

Staff members of KWS and Forest Department were questioned regarding various aspects of the fence, the community, and the relationship between people and the protected area. Much of the information from these interviews is incorporated into the specific location results on the preceding pages.

Number of people interviewed: 7 (2 KWS, 5 FD)

Sex: 100% male

Age: range: 26-50 years mean: 30 years

Years in position: range: 0.25-2 years mean: 0.8 years

What is the level of:

-Crop damage:	43% -a lot	57% -a little	0% -none
-Damage to property:	0% -a lot	14% -a little	86% -none
-Loss of livestock:	0% -a lot	43% -a little	57% -none

Animals most responsible for damage: Elephant, Sykes' monkey, bush pig.

What is the level of:

-Fuel-wood:	100% -a lot	0% -a little	0% -none
-Lumber:	29% -a lot	0% -a little	71% -none
-Poles:	0% -a lot	14% -a little	86% -none

-Others: grazing, cultivation, water.

Opinion of fence: 100% -good

Notes:
-People in area are afraid of losing their own private land to Forest Reserve or National Park.
-People are dependent on Forest Reserve resources.
-Ken Kuhle has organized meetings to inform public about fence.
-Plan to put a lodge in the Wanjerere Forest Station area.

Phase: 5 | Fence status: Proposed
Location: Gatare Forest Station | Village: Kinyona, Mununga, Wanyaga

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Average plot size: 1.2 ha and 0.2 -0.4 ha shambas.
Main crops: Maize, beans, potatoes, livestock.
Proximity to protected area: Bordering and within Forest Reserve.

Number of people interviewed: 17
Sex: 29% female
Age: range: 20-74 years mean: 45 years
Years on farm: range: 2-74 years mean: 29 years

Problems with wildlife:

-Crop damage:	47% -a lot	47% -a little	6% -none
-Damage to property:	0% -a lot	0% -a little	100% -none
-Loss of livestock:	6% -a lot	18% -a little	76% -none

Animals most responsible for damage: Elephant, porcupine, bush pig.
Methods of protection currently used: Noise and fires.

Current use of protected area:

-Fuel wood:	94% -a lot	0% -a little	6% -none
-Lumber:	6% -a lot	0% -a little	94% -none
-Poles:	0% -a lot	6% -a little	94% -none

-Others: grazing livestock.

Previous informing or consultation regarding fence: 47% -no
Attitude in regard to proposed fence:
0% -unhappy 12% -neutral 88% -happy

Notes:
This is another of the Aberdare's wealthier locations, due mainly to the fact that most people harvest tea. There appears to be plenty of water outside the Forest Reserve, and people reported the community's biggest problems to be bad roads and the long distance to schools. While individuals did report damage caused by wildlife, most of this was seasonal and limited mainly to those whose plots immediately on the border of the Forest Reserve.

The Nyayo Tea Zone extends along the Forest Reserve border in this area, and people report working as seasonal labourers. A Nyayo Tea Zone supervisor reported that elephants often trample tea on their way to raid crops. The main reported uses of the Forest Reserve are grazing and the gathering of fuelwood. Most people indicated they go in up to 5 km from the Forest Reserve boundary. As in other areas where livestock graze in the forest, people have considerably more cattle than their own plots can support. There is some admitted poaching of poles and lumber. There does not appear to be much in the way of Forest Department enforcement (one Forest Guard said there were no receipts or permits for forest use, but that he could remember who had paid and who had not).

Some report being 'promised' electricity once the fence is constructed.

Phase: 5 & 6 | Fence status: Proposed
Location: Gatamayu River Area | Village: Kambaa, Nduiriri

Average plot size: 1.6 ha with 0.1 -0.4 ha shambas.
Main crops: Tea, maize, beans, potatoes, livestock.

Proximity to protected area: Bordering and within Forest Reserve.

Number of people interviewed: 6
Sex: 17% male
Age: range: 26-60 years mean: 45 years
Years on farm: range: 26-60 years mean: 40 years

Problems with wildlife:

-Crop damage:	50% -a lot	50% -a little	0% -none
-Damage to property:	0% -a lot	0% -a little	100% -none
-Loss of livestock:	0% -a lot	0% -a little	100% -none

Animals most responsible for damage: Elephant, Sykes' monkey, porcupine.
Methods of protection currently used: Noise to frighten, traps, and fires.

Current use of protected area:

-Fuel wood:	100% -a lot	0% -a little	0% -none
-Lumber:	0% -a lot	0% -a little	100% -none
-Poles:	17% -a lot	17% -a little	66% -none

-Others: grazing, cultivation, medicinal plants.

Previous informing or consultation regarding fence: 100% -no
Attitude in regard to proposed fence:
0% -unhappy 34% -neutral 66% -happy

Notes:
This area has an enormous amount of illegal use of Forest Reserve wood products, as evidenced by the piles of poles seen in the Forest Reserve and the badly degraded status of the forest. The fact that some people freely admitted to stealing poles shows that there is little fear of retribution and obviously little in the way of enforcement.

Forest Department in this area is either unable or unwilling to control access to the Forest Reserve and the use of Forest Reserve products. Most people admitted to not having permits to graze, get Fuelwood, or cut poles, all of which was taking place extensively. People in Nduiriri claim that no one has needed permits for Forest Reserve use for nearly 10 years. While respondents understood that the fence would greatly limit the level of illegal activity, they were very positive about the potential reduction in damage by wildlife.

There is a large amount of cultivation of Forest Reserve land under the Shamba System around Kambaa, with most plots being 0.2 -0.4 ha The standard fee for cultivating is KShs 120 per year. However, all respondents reported that it was necessary to pay the Forester personally between KShs 3,000 -4,000 per year to receive a plot.

Phase: 5 & 6 Fence status: Proposed
Sample: Forest Department employees

Staff members of the Forest Department were questioned regarding various aspects of the fence, the community, and the relationship between people and the Forest Reserve. Much of the information from these interviews is incorporated into the specific location results on the preceding pages.

Number of people interviewed: 5

Sex: 100% male

Age: range: 25-40 years mean: 33 years

Years in area: range: 5-40 years mean: 15 years

What is the level of:

-Crop damage:	100%	-a lot	0%	-a little	0%	-none
-Damage to property:	0%	-a lot	60%	-a little	40%	-none
-Loss of livestock:	0%	-a lot	100%	-a little	0%	-none

Animals most responsible for damage: Elephant, Sykes' monkey, bush pig, hyenas.

What is the level of:

-Fuel-wood:	100%	-a lot	0%	-a little	0%	-none
-Lumber:	40%	-a lot	40%	-a little	20%	-none
-Poles:	20%	-a lot	40%	-a little	40%	-none

-Others: grazing, cultivation, water, topsoil/peat.

Opinion of fence: 100% -good

Notes:
-Large amounts of illegal use of the Forest Reserve in this area.
-Elephants and Sykes' monkeys cause damage to plantations.

Phase: 6 | Fence status: Proposed
Location: Kieni Forest Station | Village: Karunyaka, Kieni, Gakoe

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Average plot size: 2 ha with 0.2 -0.4 ha shambas.

Main crops: Tea, maize, beans, potatoes, livestock.

Proximity to protected area: Bordering Forest Reserve. Extensive cultivation of Forest Reserve land under the Shamba System. The main cash crop for many in this area is tea.

Number of people interviewed: 10

Sex: 60% male

Age: range: 19-80 years mean: 43 years

Years on farm: range: 19-80 years mean: 23 years

Problems with wildlife:

-Crop damage:	40% -a lot	40% -a little	20% -none
-Damage to property:	0% -a lot	0% -a little	100% -none
-Loss of livestock:	60% -none	40% -n/a (no livestock)	

Animals most responsible for damage: Elephant, bush pig, Sykes' monkey.

Methods of protection currently used: Noise to frighten animals away, and dogs.

Current use of protected area:

-Fuel wood:	70% -a lot	10% -a little	20% -none
-Lumber:	0% -a lot	30% -a little	70% -none
-Poles:	0% -a lot	30% -a little	70% -none

-Others: grazing, medicinal plants, water, and cultivation.

Previous informing or consultation regarding fence: 100% -no

Attitude in regard to proposed fence:
0% -unhappy 40% -neutral 60% -happy

Notes:
This is a very complicated area in which to assess community needs and activities. For those people not using the Forest Reserve for cultivation through the Shamba System, there appears to be little problem with wildlife outside of the occasional Sykes' monkey or other medium-sized mammal. With the financial gains granted by the harvesting of tea, many people are not dependent on the Forest Reserve for their day to day material needs. Many claim to purchase products such as food, lumber and fuel-wood from others. However, the existence of raw cut lumber and poles on people's property and the heavily degraded status of the Forest Reserve suggest otherwise. It is

obvious that there is illegal taking of forest products in the area. As with many of the other communities bordering the Forest Reserve, most people with livestock graze them within the Forest Reserve.

The shamba area near the Kieni Forest Station is difficult to understand. While it is general policy that there is to be no permanent settlement within the Forest Reserve, and that cultivation is only allowed under the Shamba System and with Forest Department supervision, individuals cultivating within the boundary claimed to reside there, having no other residence. Most of these people were evicted from other places within Forest Reserves, and claim to have been given land at Kieni by Forest Department. Unlike in other locations where the Shamba System is in place, the people interviewed in this area reported not having to pay a yearly fee for cultivating within the Forest Reserve. Respondents said that they would be relocated to other plots when Forest Department plants seedlings on their current shambas, but most had been there at least 3 years and no seedlings had yet been planted.

The people cultivating these shambas complain of damage by elephants and Sykes' monkeys. One respondent claimed that Forest Department officials often demanded "something little" (money) in order to patrol the area and repulse wildlife.

Phase: 6 Fence status: Proposed
Location: Ragia Forest Station Village: Ragia Settlement

Average plot size: 1 ha with 0.2 -0.4 ha shambas.

Main crops: Maize, beans, potatoes, livestock.

Proximity to protected area: Bordering and within Forest Reserve. Due to the small number of people interviewed, in-depth information regarding the settlement is not available.

Number of people interviewed: 4
Sex: 100% male
Age: range: 35-48 years mean: 41 years
Years on farm: range: 10-25 years mean: 18 years

Problems with wildlife:

-Crop damage:	100% -a lot	0% -a little	0% -none
-Damage to property:	0% -a lot	0% -a little	100% -none
-Loss of livestock:	0% -a lot	0% -a little	100% -none

Animals most responsible for damage: Elephant, Sykes' monkey.
Methods of protection currently used: Noise to frighten.

Current use of protected area:

-Fuel wood:	100% -a lot	0% -a little	0% -none
-Lumber:	0% -a lot	0% -a little	0% -none
-Poles:	0% -a lot	0% -a little	0% -none

-Others: grazing, cultivation, and water.

Previous informing or consultation regarding fence: 100% -no

Attitude in regard to proposed fence:
0% -unhappy 0% -neutral 100% -happy

Notes:
Because of the small sample of people interviewed, it is difficult to get an accurate assessment of community activities and attitudes in this area. However, from talking with the Assistant Forester as well as with some members of the community, it is possible to get a general picture. As with many communities bordering the Forest Reserve, there is a large amount of reported damage to crops by wildlife, especially by elephants. While most of this damage is concentrated within the Forest Reserve, there is some damage on farms that border the Forest Reserve.

Respondents claim that the biggest problems in the settlement area are the lack of grazing land and competition for cultivable land. The Assistant Forester reported lots of problems with elephants causing damage to shambas as well as to plantation trees. While there is no problem of encroachment in the area, there is a high level of poaching of wood products. She claimed enforcement and arrest were difficult due to the lack of staff and vehicles.

Phase: 6 | Fence status: Proposed
Location: South Kinangop | Village: Holyoak, Kiburu, Njabini

Average plot size: 1 ha with 0.25-1 ha shambas.

Main crops: Beans, potatoes, livestock.

Proximity to protected area: Bordering and within Forest Reserve.

Number of people interviewed: 7

Sex: 43% female
Age: range: 30-65 years mean: 39 years

Years on farm: range: 0.4 - 30 years mean: 15 years

Problems with wildlife:

-Crop damage:	100%	-a lot	0%	-a little		0%	-none
-Damage to property:	0%	-a lot	14%	-a little		0%	-none
-Loss of livestock:	14%	-a little	29%	-n/a (no livestock)		43%	-none

Animals most responsible for damage: Elephant, antelope, Sykes' monkey, and buffalo (rarely).
Methods of protection currently used: Noise to frighten, fires.

Current use of protected area:

-Fuel wood:	100%	-a lot	0%	-a little	0%	-none

-Others: grazing and cultivation.

Previous informing or consultation regarding fence: 100% -none
Attitude in regard to proposed fence:

0%	-unhappy	29%	-neutral	71%	-happy

Notes:
This area is similar in many ways to the other areas of the southern end of the Aberdares Forest Reserve. There is a large area of land cultivated within the Forest Reserve under the Shamba System, and numerous complaints about elephant damage. While most of these complaints are limited to the shambas and plantations within the Forest Reserve, there are also reports of elephants leaving the forest and causing damage on adjacent farms. People report not growing maize because of elephants. There is obviously some illegal taking of forest products, though it is impossible to calculate how much. On one occasion during the study, 4 men were seen entering the Forest Reserve with spears and four dogs. It can be assumed that at least some level of illegal hunting is taking place.

As in some other areas, people reported having to pay the Forester KShs 3,000 - 4,000 on top of the KShs 75 yearly fee in order to acquire a shamba to cultivate within the Forest Reserve.

Along with problems with wildlife, respondents indicated that the major problems in the community are poor road conditions and lack of adequate transport, which make it difficult to move produce for sale.

Phase: 7 | Fence status: None
Location: Tulaga | Village: Mutarakwa, Mutamaiyo

Average plot size: 4.1 ha.

Main crops: Maize, potatoes, peas, vegetables, livestock.

Proximity to protected area: 8 km away from bordering of Forest Reserve. Some had shambas within the Forest Reserve.

Number of people interviewed: 43

Sex: 65% women

Age: range: 19-72 years mean: 37 years

Years on farm: range: 1-39 years mean: 17 years

Problems with wildlife:

-Crop damage:	36% -a lot	30% -a little	34% -none
-Damage to property:	0% -a lot	23% -a little	77% -none
-Loss of livestock:	9% -a lot	36% -a little	55% -none

What animals are mainly responsible for damage: Black-and-white colobus, Sykes' monkey, bush pig, elephant, porcupine, lion.

Methods of protection currently used: Fencing, vigilance at night, chasing animals away, scarecrows.

Current use of protected area:

-Fuel wood:	35% -a lot	51% -a little	14% -none
-lumber:	5% -a lot	7% -a little	88% -none
-Poles:	7% -a lot	19% -a little	74% -none
-Medicine:	2% -a lot	14% -a little	84% -none

-Others: grazing and cultivation of forest shambas were extensive.

Previous informing or consultation regarding fence: Most people had heard nothing, although a few people had heard rumours.

Attitude in regard to a possible fence:
7% -unhappy 10% -neutral 83% -happy

Notes:
The people in Tulaga Scheme rely on the Forest Reserve on a daily basis. Most people collect their Fuelwood there, and many people also collect other forest products. Grazing in the Forest Reserve is common, and many families also have shambas within the Forest Reserve. For some, the shambas in the Forest Reserve are the only farmland they have.

The damage to crops is predominantly taking place on the forest shamba plots, and livestock lost predominantly occurs while grazing in

the Forest Reserve. Even so, damage reported was relatively infrequent and low in comparison with other areas.

People interviewed expressed happiness at the suggestion of a fence which would keep wildlife off of their farmland, but they were reluctant to give up their access to Fuelwood, grazing land, and cultivable forest land.

It should be noted that although forest shambas were extremely common in this area, most of them actually had rows of saplings planted between the crops. This is the point of the Shamba System, and it was not widely observed at this level in the other regions visited between here and Wanjohi.

Phase: 7 | Fence status: None
Location: Kitiri | Village: Kitiri, Kitogo

Average plot size: 1.5 ha.

Main crops: Potatoes, maize, livestock

Proximity to protected area: 2 km away from border of Forest Reserve.

Number of people interviewed: 5

Sex: 80% male

Age: range: 24-72 years mean: 39 years

Years on farm: range: 4-35 years mean: 18 years

Problems with wildlife:

-Crop damage:	80%	-a lot	0%	-a little	20%	-none
-Damage to property:	0%	-a lot	40%	-a little	60%	-none
-Loss of livestock:	0%	-a lot	40%	-a little	60%	-none

What animals are mainly responsible for damage: Antelope, black-and-white colobus, bush pig.

Methods of protection currently used: Fencing, chasing animals away, scarecrows.

Current use of protected area:

-Fuel wood:	0%	-a lot	100%	-a little	0%	-none
-Lumber:	0%	-a lot	40%	-a little	60%	-none
-Poles:	20%	-a lot	20%	-a little	60%	-none
-Medicinal plants:	20%	-a lot	40%	-a little	40%	-none

-Others: cultivation of forest shambas, grazing, water.

Previous informing or consultation regarding fence: One person had heard about the fence.

Attitude in regard to possible fence:
0% -unhappy 0% -neutral 100% -happy

Notes:
Although the number of people interviewed in this area was small, they were all supportive of a fence to control wild animals. They claim to have a lot of crop damage at their plots in the Forest Reserve, and also some on their farms. Livestock loss was minimal.

There are large areas of farm plots here deep within the Forest Reserve. The Forest Reserve is heavily used for cultivation and also for Fuelwood and other forest products.

Phase: 7 | Fence status: None
Location: Nandarasi | Village: Nandarasi

Average plot size: 2.7 ha.
Main crops: Maize, potatoes, onions, carrots, livestock.

Proximity to protected area: 3 km away to border of Forest Reserve. Many people had shambas in the Forest Reserve, and some people only had Forest Reserve shambas.

Number of people interviewed: 25
Sex: 60% male
Age: range: 20-60 years mean: 38 years
Years on farm: range: 2-60 years mean: 19 years

Problems with wildlife:

-Crop damage:	56%	-a lot	20%	-a little	24%	-none
-Damage to property:	28%	-a lot	44%	-a little	28%	-none
-Loss of livestock:	28%	-a lot	32%	-a little	40%	-none

What animals are mainly responsible for damage: Elephant, bush pig, leopard, lion.
Methods of protection currently used: Fencing, lighting fires, keeping vigilance at night, reporting to Game Department.

Current use of protected area:

-Fuel wood:	36%	-a lot	56%	-a little	8%	-none
-Lumber:	4%	-a lot	12%	-a little	84%	-none
-Poles:	4%	-a lot	24%	-a little	72%	-none
-Medicinal plants:	0%	-a lot	28%	-a little	72%	-none

-Others: water, bamboo, honey. Grazing and cultivation of forest shambas were extensive.

Previous informing or consultation regarding fence: None of the people interviewed had heard about the fence.
Attitude in regard to possible fence:
0% -unhappy 4% -neutral 96% -happy

Notes:
The farms in this area seem to be incurring very little damage from wildlife. Most people also cultivate in the Forest Reserve, which is where the majority of the wild animal damage to crops occurs. Most of the farms are less than 1 ha, so people rely heavily on their farm plots in the Forest Reserve. They would be happy about a fence if it were higher up on the slope at the boundary between the Forest Reserve and the National Park. They want the benefits of a fence to keep wild animals from their property, but they still want the benefits they receive from the Forest Reserve. Only a few individuals admitted agreement with the idea of a fence at the Forest Reserve boundary. They realized the importance of the Forest Reserve as a watershed and as a potentially sustainable source of Fuelwood and other Forest resources.

Phase: 7 | Fence status: None
Location: Geta Forest Station | Village: Geta, Mikeu

Average plot size: 1.8 ha.

Main crops: Maize, potatoes, peas, carrots, onions, cabbages, fruits, livestock.

Proximity to protected area: Most bordering Forest Reserve, with a few as far as 650 m away. Many people also had farms in the Forest Reserve.

Number of people interviewed: 35

Sex: 57% male

Age: range: 19-68 years mean: 45 years

Years on farm: range: 2-35 years mean: 23 years

Problems with wildlife:

-Crop damage:	26%	-a lot	23%	-a little	51%	-none
-Damage to property:	6%	-a lot	20%	-a little	74%	-none
-Loss of livestock:	34%	-a lot	37%	-a little	29%	-none

What animals are mainly responsible for damage: Elephant, antelope, hyaena, leopard, lion.

Methods of protection currently used: Fencing, keeping of dogs, keeping livestock enclosed in a pen at night, watching crops all night when ripe.

Current use of protected area:

-Fuel wood:	17%	-a lot	49%	-a little	34%	-none
-Lumber:	0%	-a lot	3%	-a little	97%	-none
-Poles:	0%	-a lot	11%	-a little	89%	-none
-Medicinal plants:	3%	-a lot	17%	-a little	80%	-none

-Others: water, honey. Grazing and cultivation of forest shambas were extensive.

Previous informing or consultation regarding fence: Most had heard nothing, although a few people had heard rumours.

Attitude in regard to proposed fence:
9% -unhappy 14% -neutral 77% -happy

Notes:
Farms in the Geta Scheme are situated high up on relatively steep slopes. There is a game moat at the edge of the forest throughout a portion of the Scheme, but the moat is extremely overgrown, and filled in for livestock to pass. Nonetheless, several

people cited this 1m-wide moat as a deterrent for wild animals such as elephants.

Grazing in the forest is ubiquitous. Most of the livestock lost over the years was taken while grazing in the Forest Reserve. People are supportive of the fence to reduce this but only on the condition that they retain that grazing land. It was suggested numerous times that the fence be constructed at the boundary between the Forest Reserve and the National Park. People were adamant about keeping their grazing land.

From observations on peoples' homesteads, the use of the Forest Reserve for forest products such as Fuelwood, lumber, and poles was greatly understated. These people would like a fence to keep the wild animals from exploiting their property, but most would be unwilling to give up their access to exploit the Forest Reserve.

Phase: 7 Fence status: None
Sample: Forest Department Employees Location: Mutarakwa Forest Station, Tulaga Scheme

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Number of people interviewed: 7

Sex: 86% male

Years in position: range: 3-33 mean: 22 years

What is the level of:

-Crop damage:	29%	-a lot	57%	-a little	14%	-none
-Damage to property:	0%	-a lot	29%	-a little	71%	-none
-Loss of livestock:	0%	-a lot	71%	-a little	29%	-none

Animals most responsible for damage: Sykes' monkey and black-and-white colobus cause the most damage, with bush pigs sometimes as well. Rare occurencess of elephant, lion, hyaena, and leopard.

What is the level of:

-Fuel wood:	71%	-a lot	29%	-a little	0%	-none
-Lumber:	14%	-a lot	29%	-a little	57%	-none
-Poles:	14%	-a lot	43%	-a little	43%	-none
-Medicinal plants:	0%	-a lot	43%	-a little	57%	-none

Your opinion of the fence:

0% -bad	14% -neutral	86% -good

Notes:

There were two types of responses received from these workers:

The first was from the people working here the longest. They seemed to emphasize how bad the wild animals were on the local people. They also reported little illegal use of the Forest Reserve and suggested gates in the fence for grazing, cultivation, and Fuelwood collection, or to put the fence up the slope inside the Forest Reserve.

The other people were more sensitive to the well-being of the Forest Reserve. They emphasized how bad most people exploited the Forest Reserve. Charcoal burning, lorries collecting timber, and local people taking forest products without a permit were all mentioned. A fence would make their job of monitoring these activities easier. They did admit that while most animals were not common, Sykes' monkey and black-and-white colobus were a problem, although only on the forest shambas - not on the farm plots in the Forest Reserve.

Phase: 7 & 8 — Fence status: None
Sample: Forest Department and KWS employees — Location: Geta Forest Station, Mutubio Gate

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Number of people interviewed: 11 (9 FD, 2 KWS)

Sex: 91% male

Years in position: range: 1-30 years mean: 13.8 years

What is the level of:

-Crop damage:	73%	-a lot	27%	-a little	0%	-none
-Damage to property:	64%	-a lot	18%	-a little	9%	-none
-Loss of livestock:	55%	-a lot	18%	-a little	27%	-none

Animals most responsible for damage: Elephant, bush pig, lion, hyaena, Sykes' monkey.

What is the level of:

-Fuel wood:	73%	-a lot	36%	-a little	0%	-none
-Lumber:	36%	-a lot	9%	-a little	55%	-none
-Poles:	27%	-a lot	64%	-a little	9%	-none
-Medicinal plants:	0%	-a lot	64%	-a little	36%	-none

Your opinion of the fence: 100% -good

Notes:
Most of the workers interviewed seemed quite naive regarding the use of the Forest Reserve by local people. A group of them were sitting in front of the Forest Department building and not doing any work. The two head Foresters were not around at all for the first couple of days we were there. The people I am referring to suggested that a fence be erected higher up the slope within the Forest Reserve.

Some of the workers believed that illegal activities were excessive and that a fence could help them to control those activities.

People in the community whose property is affected by wild animals would appreciate a fence, while those engaging in illegal activities would be unhappy.

Phase: 8 | Fence status: None
Location: Wanjohi & Karima | Village: Gitei, Gathore, Wanjohi, Rayetta, Dosca, Kirima

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Average plot size: 5.9 ha.

Main crops: Maize, potatoes, cabbages, carrots, livestock.

Proximity to protected area: 1 km to the border of the Forest Reserve.

Number of people interviewed: 19

Sex: 68% male

Age: range: 18-64 years mean: 41 years

Years on farm: range: 1-38 years mean: 27 years

Problems with wildlife:

-Crop damage:	5%	-a lot	47%	-a little	47% -none
-Damage to property:	0%	-a lot	5%	-a little	95% -none
-Loss of livestock:	16%	-a lot	53%	-a little	32% -none

What animals are mainly responsible for damage: Sykes' monkey, black-and-whte colobus, bush pig, leopard, hyaena.

Methods of protection currently used: Fencing, keeping dogs, scarecrows, keeping animals enclosed in a holding pen at night, reporting to KWS.

Current use of protected area:

-Fuel wood:	10%	-a lot	47%	-a little	42% -none
-Lumber:	0%	-a lot	10%	-a little	90% -none
-poles:	5%	-a lot	5%	-a little	90% -none
-Medicinal plants:	5%	-a lot	32%	-a little	63% -none

-Others: grazing, cultivation of forest shambas, water, charcoal.

Previous informing or consultation regarding fence: Nobody had heard anything about a fence.

Attitude in regard to proposed fence:
0% -unhappy 5% -neutral 95% -happy

Notes:
The people interviewed in this area are generally happy about the idea of a fence being erected in their area with its potential for reducing human-wildlife conflict. Many farms were not affected at all by wildlife, and were happy because they knew some of their friends had incurred some damage due to wild animals.

Several individuals said that they would like to have continued access to the forest for collection of resources like Fuelwood and for

grazing. One village's residents (Kirima) said that they no longer used the Forest Reserve at all because government officials told them not to, although they still admitted some use.

This area as a whole seemed to be in relatively good shape with respect to wildlife damage, and most incidents cited happened far in the past. The farms here are relatively large, so people rely less on the Forest Reserve for resources, although it still benefits most people in some way or another. One region (Gathore) had extensive cultivation just inside the Forest Reserve boundary, much of which was apparently controlled by a commercial carrot producer who was not cooperating with the Forest Department.

RECOMMENDATIONS

It would be unrealistic and presumptuous to attempt to address all the concerns of the communities involved in this study. Due to the many differences in location, needs and attitudes, it is impossible to offer general recommendations that would resolve all of the issues stemming from or remaining after the construction of the fence. However, it is possible to point out some of the more important concerns, and offer some recommendations for the improvement and continuation of the Aberdares Wildlife Fence Project.

It should be noted that KWS and the Forest Department, in regard to the fence project, have generally done an admirable job of emphasizing protection of natural resources, while attempting to accommodate the needs of the human population in the region. While it is not possible to satisfy every objective, the fence, where it is in place, does an excellent job of reducing human-wildlife conflict by restricting most wildlife movement to the confines of the fence's boundary. Similarly, it successfully limits and helps to control the exploitation and illegal taking of protected area resources.

The low level of enforcement by Forest Department of restrictions on forest use, the unsustainable taking of forest products, and the continued problems with wildlife around unfenced areas certainly justify the continuation of the Aberdares Wildlife Fence Project.

The recommendations made here are based on observation and survey of the areas and communities involved, and should be treated as a resource for monitoring the impact of the wildlife fence and for the implementation of further study or policy.

In many instances, the recommendations put forth here are applicable to more than one phase of the Aberdares Wildlife Fence Project. In these situations, repetition is unnecessary and areas where concerns overlap are referred back to the appropriate discussion.

PHASE 1

The Phase 1 fence was completed in 1990 and encompasses almost all of the National Park area known as the "Salient." As the communities affected by the Phase 1 fence are adjacent to the National Park boundary and have, therefore, been denied consumptive use of that area of forest for many years, there are few new concerns that arise from the construction of the fence. The fence has been successful as a physical barrier prohibiting unauthorized human entry to the National Park, and has greatly

reduced the incidence of large wild mammals exiting, most importantly elephant, buffalo, and antelope.

Recommendation 1: Medium-sized Mammals

The only complaint of any real substance was in regard to the continued crop raiding by baboons, Sykes' monkeys, and porcupines. As the construction of a fence which could repel these particular species would be prohibitively expensive, it is more prudent to utilize alternative measures. Some simple community involvement could greatly reduce the amount of damage done by these three problem species.

Since baboons, Sykes' monkeys and porcupines all have relatively predictable habits and are active during specific times of the day, a person patrolling a manageable area of fence should be able to repel a majority of the invaders with the simplest of means (e.g., sticks, noise makers, stones).

-The most active times of day/year for each species should be determined, and the simplest, most effective means of repulsing them should be found.

-One person per 1-2 kilometre section of fence (volunteering or hired jointly by the affected residences) could patrol and effectively reduce the presence of raiding medium-sized mammals in that area.

The relative increase in crop yield should compensate land owners for the meagre expenditure required to employ and supply a part time patrol during the times when crops are most attractive to these species.

PHASE 2

The Phase 2 fence was completed in 1994 and stretches along the Forest Reserve boundary between the Park's Wanderis Gate and the Forest Reserve is National Park's Rhino Gate. It includes the area known as the Karemeno Triangle.

The community issues involved in the Phase 2 fence are considerably more complex than those for the neighbouring Phase 1 fence. The positive aspects of the fence are generally appreciated by the communities. However, the fact that the fence is along Forest Reserve rather than National Park boundary and, therefore, reduces the level of taking of forest resources, makes some people in the area unappreciative of the fence and the new restrictions.

With the exception of some of the north of the phase 2 fence, there is been a reduction in the level of wild animal damage to

farms adjacent to the fence. While most respondents were very appreciative of this decline, and willingly accepted the compromise that offers security at the cost of limited access to Forest Reserve resources, many complained about difficulties they face without their previous level of forest exploitation. It is noted, however, that the previous level of use was unsustainable and generally illegal. Many people became accustomed to taking much more from the forest than they were permitted.

Recommendation 2: Community Awareness

A campaign for community awareness and conservation education would help people to better appreciate the importance of protecting their natural resources, making them more understanding of the need for reducing and managing the consumptive use of protected area resources. If people came to understand the long-term importance of a well maintained ecosystem, there would likely be a reduction in illegal consumption and a general improvement in the relationship between the community and KWS and Forest Department staff. Community workshops, education seminars, National Park and Forest Reserve tours, and grievance meetings are a few of the methods that could be utilized to better familiarize members of the community with the Aberdares Conservation Area and the issues involved in its conservation.

Recommendation 3: Consistent Enforcement

It is important that Forest Department and KWS make a concerted effort to consistently and effectively enforce regulations governing access to and use of protected area resources in order to avoid misunderstandings and abuses of the system. This is of equal importance to, and in many ways correlated with, community awareness. The gates located along the fence offer an ideal situation for the monitoring and limiting of human use. However, while these gates might generally be well maintained and monitored, there are incidents of abuse and times when they are not monitored at all. This allows unauthorized individuals access and those with permits to take products that are not proscribed. More and better trained staff with an improved system of recording and monitoring use would help to reduce some of these problems.

Recommendation 4: Home and Agricultural Practices

Shifting from the unrestrained consumption of a seemingly boundless supply of resources to the sustainable use of a protected ecosystem will not be an easy transition for many people. Awareness of the importance of these resources and proper enforcement by officials will help to change perceptions and reduce the use of protected areas, but it is necessary to

change people's inefficient and unsustainable practices at home in order to adequately reduce dependence on the protected area.

The dependence on wood for fuel and as a building material is an enormous strain on the indigenous forest. If individuals were encouraged to cultivate trees on their own land, in time, they could be self-sustaining in regard to fuel and lumber, and those with surplus could generate income. Another possibility is the incorporation of fuel efficient stoves which require less fuel to perform the same functions as inefficient fire pits. The initial cost of supplying these units and the workshops needed for community familiarization would probably be negligible in relation to the enormous benefit to the people and the natural environment.

Another practice that is no longer a viable option to individuals restricted from use of the protected areas is the keeping of more livestock than one's property can sustain. In many instances, farmers with only 1-2 hectares of cultivated land keep 10-20 cattle, with nowhere to graze them except the protected area. Without access to pasture within the Forest Reserve, individuals will have to bring their number of livestock owned down to number congruent with the area of pasture they own or rent.

Recommendation 5: Elephants

The fact that some communities at the north end of the Phase 2 fence complained about a continued problem with elephants (in some cases, individuals reported an actual increase in elephant damage since the construction of the fence) is difficult to address. While it is possible that people who are unhappy with the fence's restrictions on protected area use are exaggerating the amount of elephant damage in order to discredit the fence project, the number of corroborating stories make it likely that there is still a substantial amount of elephant activity here (particularly Mugaka and Kiambogo). There are a number of factors which may be contributing to the continuing elephant problem, but their determination and solutions require considerably more study.

One obvious reason that the fence in this area is not as yet effective in reducing elephant presence is the area's proximity to the unfenced portion of the Forest Reserve. Some elephants may simply be leaving the forest by way of the unfenced area to the north and, on attempting to return to another section of the Forest Reserve, finding their passage blocked. This causes elephants to be essentially caught outside the Forest Reserve and concentrated on farms. This occurrence should be drastically reduced once the Phase 3 fence is completed.

Another possible reason for the continued presence of elephants in this area is its geographic location. This area apparently lies within a traditional migration route and is close to an area where salt was once placed in large amounts in order to attract elephants. These factors apparently draw elephants from many areas, including areas outside the National Park (e.g., from nearby ranches and Mt. Kenya). The fence and the growing human settlements will likely discourage elephants from continuing to use this corridor as a route between the Aberdares and surrounding areas, but this may take many years, and it is possible that its position will make this area a continuing location of elephant activity.

To make any recommendations regarding this situation would require a detailed study of the areas and animals involved. It is necessary to better understand the migration routes and seasonal habits of the elephants within the Aberdares Conservation Area and the surrounding environs, and to explore the social, environmental, and financial aspects of different solutions. The efficacy and feasibility of reestablishing the migration corridor should be seriously considered, and alternative measures such as seasonal protected area access, increased patrol, and placement of minerals should be investigated.

PHASE 3

Since only about 1 km of the Phase 3 fence has been completed, it is hoped that the lessons learned from the fencing of Phases 1 and 2, as well as some of the recommendations included here, will be utilized when the remaining portion is constructed.

Recommendation 6: Rapid Completion of Proposed Fence

There are a number of factors which might delay the construction of the fence in some areas. Funding, alignment recommendations, and materials can all be difficult to acquire and may slow the completion of the phase 3 fence. However, measures should be taken to complete the fence, once clearing is begun, as expediently as is practicable. In many areas along Phase 3, the proposed fence-line was cleared over 1 year ago and construction of the fence has yet to begin. While it is understood that some delays cannot be avoided, the resultant pathway and filling-in of the existing game moat have actually increased problems in the area. Large mammals now have a clear pathway from the protected area to the neighbouring farms, and the moat has been filled in a number of places, rendering it ineffective. Furthermore, some residents of the area, seeing that an end to their illegal removal of forest products is imminent, have increased their taking of these resources (particularly Juniper and other valuable trees). For these reasons, it is essential

that all effort be made to complete the phase 3 fence, in an effective and timely fashion.

Recommendation 7: Water

Though people can live with a reduction in the amount of many of the resources they obtain from the protected area, water is not a negotiable commodity. In some of the communities along Phase 3, access to water anywhere but within the Forest Reserve is a considerable journey away. During drought, there is apparently little water anywhere outside of the Forest Reserve. It is recommended that individuals in these areas be granted access to water sources within the Forest Reserve or, as in many other communities, KWS and Forest Department could make water available to people outside the protected area by creating community reservoirs and boreholes.

Recommendation 8: Other Forest Resources

The sustainability of forest use is discussed in the Phase 2 section of these recommendations, as well as in other parts of the Aberdares Wildlife Fence Study. These same issues are relevant to policy implementation regarding the Phase 3 fence.

Many of the communities along the Forest Reserve boundary of Phase 3 rely extensively on the forest for materials such as fuelwood, grazing, water and lumber. While every attempt should be made to reduce the communities' dependence on these resources (see Recommendation 4), until that reduction occurs, it is necessary to allow limited access. Gates, if properly monitored, would allow individuals to get the supplies they need and would serve as an effective deterrent against over-utilization.

Recommendation 9: Community Involvement in and Benefit from Protected Areas

One of the most effective deterrents against over-consumption of protected area resources is to encourage the community to value the area and have a vested interest in its survival as a healthy ecosystem. This can be achieved in a number of ways. The community awareness and education programs discussed previously can be of great help, but having people receive direct financial and social benefit may be the best way to ensure that they will defend and conserve the protected area in the future.

One of the most practical and immediate means by which people can gain employment from the forest is by working on the construction of the fence. Labour, maintenance, patrolling, and gate monitoring are all areas in which people from the community can be involved.

With an increase in the level of tourism in the area, there would undoubtedly be an expansion in the number of employment opportunities. From the construction and maintenance of roads, lodges and other tourist facilities, to the staffing and catering of these new ventures, individuals from the surrounding communities should play important roles. With an increase in tourist traffic, existing restaurants, hotels, and markets will see an increase in trade. These development aspects of the fence project should be carefully considered. KWS and Forest Department should assist in their implementation while ensuring that these activities are sustainable and of minimal impact to the Aberdares ecosystem.

PHASES 4 AND 5

There is no fence yet in Phases 4 or 5, though clearing of the proposed fence-line has been completed from the Ruhuruini area south to the Chanya River (ca. 10 km). Again, it is hoped that the lessons and recommendations of previous phases can be applied to the fence project in this area.

Recommendation 10: Encroachment and Loss of Shamba Plots

As in all the other phases, community awareness of and involvement in the fence project is vital. This is most important in instances where people will have to change their current level of use or practices. There are a few areas (in particular around Ruhuruini Gate and at the west end of Mucharage Road) where the placement of the fence will move people from existing illegally established shamba plots. If Forest Department had been consistently enforcing the Shamba System this would not be a problem, but in many cases individuals have been cultivating land for longer than the permitted period. Individuals who are encroaching, and some individuals whose established shambas fall within the proposed fence-line will be unhappy with the placement of the fence. It is important that these people be moved with some diplomacy, in order to minimize negative opinions toward the fence.

Recommendation 11: Fuelwood and Grazing

There are already a number of suggestions in this paper for changing and reducing the dependence on the Forest Reserve as a source of fuelwood and grazing. As these are two of the three most widely reported community uses of the Forest Reserve along Phases 4 and 5 (the other being cultivation), it is important that any possibilities for reducing this dependency be explored.

There are areas within the forest plantation and other sections of the Forest Reserve where fires, elephant damage and inefficient logging practices have left large amounts of unused

dead wood. If Forest Department could organize and monitor the collection and distribution of this excess wood, it could provide fuel for a number of households, reduce the occurrence of people coming to collect Fuelwood, and generate funds for the Forest Reserve and some people in the community.

Grazing in most of the areas in Phases 4 and 5 is widespread in the Forest Reserve and heaviest along roads and in plantations. Continued grazing without rotation causes erosion and retards or prevents the natural regeneration of cleared and partly cleared areas. If grazing in the Forest Reserve cannot be stopped or significantly reduced, better controlled and monitored use of the Forest Reserve must be implemented. Herdsmen should be directed to use only specific areas of the Forest Reserve for grazing, and these areas must be rotated as necessary for their continued productivity.

Recommendation 12: Nyayo Tea Zone

The Nyayo Tea Zone was designed to utilize Forest Reserve land to generate income for the government as well as adjacent communities while creating a physical barrier to discourage encroachment by humans and crop-raiding by animals from the Forest Reserve. Its effectiveness , however, is undetermined. While it clearly defines the Forest Reserve boundary in some areas, and some mammals may be less likely to travel through 100 meters of tea to raid crops, the management of the Nyayo Tea Zone in some areas is questionable. Many people complained of receiving unfair wages and about the generally poor manner in which the Nyayo Tea Zone is run. The Nyayo Tea Zone, if managed properly, could be an opportunity for the forest to sustainably generate income and employment for a number of individuals without putting undue pressure on the Forest Reserve. However, the present existence of dissatisfied workers, poor management, wasted crops, and wasted land shows that it is not reaching its potential.

The presence of large areas of cleared Forest Reserve but unplanted Nyayo Tea Zone is an indication of waste of Forest Reserve and human resources. Even if an area of land is demarcated as Nyayo Tea Zone, there is absolutely no sound reason to clear the valuable montane forest until there are the funds, materials and human resources necessary to plant tea. As it is now, there are several square kilometres of montane forest was cleared more than 10 years ago. This Forest Reserve is now nothing more than pasture for grazing livestock. This practice invites criticism of Forest Department and government officials, blurs the Forest Reserve boundary, and reduces the amount of montane forest in an ecosystem that is already over-exploited.

Enforcement of Forest Reserve regulations (see Recommendation 3)

It is necessary here to reemphasize the importance of consistent and uniform enforcement of Forest Department regulations for the phase 4 and 5 areas. The lack of enforcement of forest use restrictions, and the subsequent loss and over-utilization of Forest Reserve resources, is of serious concern.

Aside from the many reported incidents of Forest Department officials making personal profit from the direct sale or influenced acquiescence to the sale of Forest Reserve resources and Forest Reserve use privileges, there appears to be a lack of uniformity regarding the execution of guard and patrol duties. There is no consistent system for checking, tabulating or monitoring permits or receipts for forest use. The Forest Guard at the Wanyaga gate had neither a list of, nor receipts from, the individuals who Shamba System allowed access to the Forest Reserve, nor did those people using the Forest Reserve carry permits with them. He claimed that he "knew" who had paid for access permits and who had not. The people of Nduriri claimed that they had not been required to pay for permits for at least 10 years. These are only two examples of numerous incidents of the lack of proper management. While some of this may be due to simple carelessness and lack of will, the limited number of staff and lack of organizational management are also factors. It is, therefore, recommended that a uniform and universally applicable system of tabulating and monitoring forest use and access be created and implemented, such that each gate is monitored in the same fashion and that records of the amount and incidence of forest use are maintained. If Forest Department officials do not know how much and what type of forest use is occurring, how can they begin to know if that level is sustainable?

The accusation that Forest Department officials are accepting or demanding money for the illegal use of forest products or for the legitimate cultivation of cleared plantation land is based only on hearsay, but still certainly bears examination. If those charged with the protection and management of Kenya's dwindling, forests are profiting from the unsustainable consumption of those resources, there is little hope that anything but protected National Park land can continue to exist. An investigation into illegal practices is necessary to determine who is responsible, and to what extent Forest Reserve resources are being removed illegally. A more regulated system of accounting for Forest Reserve use and income derived from that use might, at the least, discourage the present rate of illegal consumption. As often as practicable, random inspections and accounting of regional forest use would be good methods of monitoring Forest Reserve exploitation. The fact that no one who was questioned from Forest Department was able to give more than an approximation regarding the amount of Forest Reserve use by the public shows that there is little understanding of, and even less control over, what is occurring within the Aberdares Forest Reserve.

Recommendation 13: Encroachment

There are numerous incidences where people in the Forest Reserve have established residence on plots reserved as temporary shambas, and places where people are illegally cultivating land.

As stated earlier, the shamba plots in the Kieni area have people on them who claim to have no residence outside of the Forest Reserve. There is also a large amount of human activity near the Kieni Forest Station - shops, shelters, and cafes that are housing individuals and encouraging more human presence within the Forest Reserve. This situation was not observed elsewhere in the Aberdares Forest Reserve. It appears to be the beginnings of a settlement and should, therefore, be removed as quickly as possible.

There is an area in the Forest Reserve at the west end of the Mucharage Road where at least 10 hectares of land are being cultivated for tobacco and other crops. This land is officially off-limits to cultivation, but the encroachers here claim to have bribed the previous Forest Guard to allow them to stay.

For reasons unexplained, there is an area along the road stretching from Kagwe to Kame (near Kereita, at the SE corner of the Forest Reserve) where there is a large amount of tea planted on either side of the road. It is obviously maintained and its proximity to the public road makes it no secret to anyone who might want to question its existence. However, it is apparently not part of the Nyayo Tea Zone, and this part of the Forest Reserve has not been degazzetted. The questions remain, then, to whom does this tea belong and why has the Forest Department allowed them to take Forest Reserve land for cultivating tea?

As has been successfully executed in other parts of the Aberdares Forest Reserve, these situations and the possibility of other encroachment should be investigated, assessed, and terminated as quickly and as diplomatically as possible.

Recommendation 14: Roads

Though it is not within the scope of these recommendations to address community problems not directly related with the Aberdares Conservation Area and the fence, it is understood that the more financially and socially sound a community is, the less likely its members are to depend on and over-exploit the local natural resources. There are a number of problems faced by the communities in this region, many of which have been discussed at other points within this report. One problem that faces nearly every sector of the Kenyan population is the poor condition of the roads and the lack of adequate transportation. A number of the people interviewed complained that poor roads was among the major problems faced by the community. Poor roads make getting

to and from facilities such as schools, hospitals, and dispensaries, long, difficult and expensive processes. Bad roads, combined with the lack of adequate transport, make the moving of crops to places of sale difficult, sometimes resulting in the loss of valuable agricultural goods and reduced profit.

The factors that claim collective responsibility for the road conditions in Kenya are far too complex and numerous to list and analyse in this writing. From mismanagement, poor construction, corruption, and weather conditions, to the inability to maintain and monitor road conditions, the problems of the roads seem insurmountable. However, like all other factors which contribute to the communities' ills and the related dependence on forest resources, they should be investigated and addressed.

CONCLUSIONS

It is unfortunate that Kenya finds itself in the position that, in order to protect its vital natural resources and the well-being of the human population, it must erect barriers, creating physical manifestations of, and further emphasizing the estrangement between, man and nature. However, the reality that Kenya cannot rely on the local bodies charged with the protection of the environment or the enforcement of and obedience to laws created to do so, demands that other measures be taken. Furthermore, the proximity of human settlement to protected habitats which hold high concentrations of wildlife increases the level of human-wildlife conflict, not only endangering residents and their crops, but also creating animosity between humans and nature, and increasing tensions between conservation authorities and the general public.

The fencing of natural habitats, while considered by many to be an extreme and generally premature response, has greatly increased the level of control over the taking of natural resources and reduced the incidence of wildlife conflict with the neighbouring human populations. While the fencing project currently under way in the Aberdares Conservation Area is still in its nascent stages, it has already been, and should continue to be, a useful tool in curbing the present level of human-wildlife conflict, and in controlling the exploitation of the Aberdares Conservation Area.

Protected Area Resource Use

The badly degraded condition of many parts of the Aberdares Forest Reserve does not bode well for the future of Kenya's

vital natural forests. It is regrettable that Forest Department in many areas appears to be unwilling or incapable of managing the conservation and preservation of such an important resource. If properly managed and maintained, the fence offers a measure of control allowing for a more effective and efficient management of the natural resources without necessarily increasing the number of personnel. By effectively limiting human access to the Aberdares Conservation Area, the fence allows officials to determine and control sustainable levels of protected area use and will provide for a better understanding of what takes place within. Though some Forest Department officials will not appreciate it, there will also be a higher level of accountability for those charged with the management of these resources. Where the fence is already in place, there is a decrease in illegal use of Aberdares Conservation Area, and officials are more aware of what activities are taking place within the protected area and better able to control human access.

Human-Wildlife Conflict

As a method of discouraging conflict between wildlife and humans, and specifically the damage to crops caused by larger mammals, the fence has proven to be a very effective tool. With the exception of a few isolated situations, there has been a dramatic decline in the incidence of wildlife damage to crops on farms adjacent to the fenced portions of Aberdares Conservation Area. The fence is well maintained and effective in containing most of the destructive wildlife, and people of the surrounding communities are generally very positive regarding this aspect of the fence. The fence can be considered competent in its objective of reducing human-wildlife conflict by effectively confining wild animals within the Aberdares Conservation Area.

Community Opinion

Community opinion regarding the fence is difficult to summarize as the situations and relationships with the Aberdares Conservation Area differ greatly from community to community. As logic would dictate, those communities most pleased with the fence are those which reside along the border, of or in close proximity to, the boundary of the National Park. In these areas, people have been denied consumptive use of the protected area for many years, yet have suffered the consequences of attempting to cultivate land close to a high concentration of wildlife. With the construction of the fence, the status and legal use of the protected area has not changed, thereby denying nothing to those who were obeying the law, while crop damage by wildlife has decreased enormously. In essence, the people near

the National Park are losing nothing with the introduction of the fence and are gaining security, higher crop yields, even the potential for increased land value. Community reaction to the fence in these areas is very positive.

Communities bordering the Forest Reserve have very differing reactions to the fence. Most are pleased with the fence and the protection from wildlife damage it offers. That protected area use was much higher and access considerably easier before the erection of the fence has, however, caused some antagonism towards the fence project. While some of the bitterness is resulting from the relative difficulty in using the Forest Reserve, the people who expressed the most bitterness were those who were using the Forest Reserve illegally and unsustainably. People would, ideally, like to have protection from crop damage while continuing previous levels of exploitation of the natural forest, even though those levels were admittedly unsustainable. Though the unsustainable practices of the past must be curtailed, there is no reason that controlled the use of Forest Reserve cannot continue if properly monitored by the authorities. It is likely that community opinion in these areas will become more positive as residents become accustomed to the new regulations and practices, and come to recognize and appreciate the benefits of crop protection and new jobs.

The fence appears to be very capable of carrying out its primary objectives of restricting unauthorized human access to the Aberdares Conservation Area and discouraging wildlife from entering adjacent farms. The continued success of this venture, however, is dependant on a number of important and all too often ignored factors: the understanding, cooperation, and support of the local communities, proper management, enforcement of resource-use regulations, and the culpability of the officials who are charged with the management and conservation of the Forest Reserve. If the methods used in, the lessons learned from, and the recommendations made regarding the fencing of Phases 1 and 2 can be followed and repeated around the rest of the Aberdares Conservation Area, then it is likely that this essential natural resource can be preserved for generations to come.

ACKNOWLEDGEMENTS

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were enthusiastic and amiable. Staff of KWS and Forest Department, whose help and comments were solicited on many occasions, were informative and generally helpful. Staff of the various Forest Department forest stations were often engaged as guides and offered valuable information regarding forest and community issues. Staff at Forest Department and KWS headquarters in Nairobi were helpful in obtaining necessary facts and information. Finally, Forest Department and KWS staff at all of the stations where we camped were extremely kind and generous with their facilities.

Date:_____

ABERDARE FENCING QUESTIONAIRE - Area of Existing Fence

Location:_____ Village:_____ Age:____ Sex:_____

Years on your farm:_____ Size of farm:_____(ha) Major crops:_____

Distance of farm from fence:____(m)
Distance of farm from access point:____(m)

*Since construction of fence, has there been a reduction in:

-Crop damage: ___none ___a little ___a lot

-Loss of livestock: ___none ___a little ___a lot

-Damage to home/fence: ___none ___a little ___a lot

Other:_____

*What methods of protection did you use before fence that you don't use now:_____

_____

*How much do you use the protected area for:

-fuel wood: ___none ___a little ___a lot

-lumber: ___none ___a little ___a lot

-poles: ___none ___a little ___a lot

-grass ___none ___a little ___a lot

*Did you receive information regarding fence prior to building:_yes _no

*Were you asked about placement of the fence and access gates:__yes__no

*Are you happy with the location of access gates:
__unhappy __neutral __happy

*Are you happy with the amount of access to the protected area:
__unhappy __neutral __happy

If you could change one thing about the fence, what would it be:_____

_____

*How do you feel about the fence:__unhappy __neutral __happy

*Comments:

Date:_____

ABERDARE FENCING QUESTIONNAIRE - Area of Proposed Fence

Location:_____ Village:_____ Age:_____
Sex:_____

Years on your farm:_____ Size of farm:_____(ha)

Distance of farm from forest edge:____(m) Major crops:_____
_____

*Have you had problems with wildlife:

-Crop damage: ___none ___a little ___a lot

-Loss of livestock: ___none ___a little ___a lot

-Damage to home/fence: ___none ___a little ___a lot

Other:_____

*What animals cause the most problems:_____

*What methods of protection do you presently use:_____

*How much do you use the protected area for:

-fuel wood: ___none ___a little ___a lot

-lumber: ___none ___a little ___a lot

-poles: ___none ___a little ___a lot

-medicinal plants: ___none ___a little ___a lot

Other:_____
_____

*Have you received prior information regarding the fence: ___yes ___no

*How do you feel about the construction of a fence:
___unhappy ___neutral ___ happy

*Comments:

Date:_____

ABERDARE FENCING QUESTIONAIRE; Area of Existing Fence- KWS ___ FD ___

Location:_____ Village:_____ Age:_____
Sex:_____

Position:_____ Number of years in area:_____

*Since construction of the fence, has there been a reduction in:

-Crop damage: ___none ___a little ___a lot

-Loss of livestock: ___none ___a little ___a lot

-Damage to home/fence: ___none ___a little ___a lot

-Other:_____

*What animals are still responsible for damage:_____
_____

*Has there been a reduction in forest use of:

-fuel wood: ___none ___a little ___a lot

-lumber: ___none ___a little ___a lot

-poles: ___none ___a little ___a lot

Other:_____
_____

*Is the fence properly maintained (damage reported and repaired quickly): ___ yes ___ no

*Are access gates properly monitored: ___ yes ___ no

*What would you change about the fence:_____
_____

*What is your opinion of the fence: ___ good ___neutral___bad

*What is the community's opinion of the fence:___ good ___neutral___bad

*Comments:

Date:_____

ABERDARE FENCING QUESTIONAIRE; Area of Proposed Fence -KWS ___ FD ___

Location:_____ Village:_____ Age:_____
Sex:_____Position:_____ Number of years in area:_____

*In this area, what is the level of:

-Crop damage: ___none ___a little ___a lot

-Loss of livestock: ___none ___a little ___a lot

-Damage to home/fence: ___none ___a little ___a lot

-Other:_____

*What animals are most responsible for damage:_____
_____

*In this area, what is the level of protected area use of:

-fuel wood: ___none ___a little ___a lot

-lumber: ___none ___a little ___a lot

-poles: ___none ___a little ___a lot

Other:_____
_____

*What is your opinion of the fence: ___ good ___neutral___bad

*What is the community's opinion of the fence:___ good ___neutral___bad

*Comments:

APPENDIX II

ABERDARES NATIONAL PARK AND ABERDARES FOREST RESERVES

WILDLIFE FENCE PLACEMENT STUDY

DISTRIBUTION AND ABUNDANCE OF TREES IN THE ABERDARES ECOSYSTEM, KENYA

DATA FOR FENCE ALIGNMENT DECISIONS AND LONG-TERM MONITORING OF IMPACT

by

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1999

SUMMARY

A total of 93 belt-transects were conducted along the eight phases of the proposed wildlife fence around the Aberdares ecosystem, Kenya (1997-98). A total of 4,459 trees ("stems") of 77 species were located along these transects. Mean number of tree species per transect was 5.9, ranging from 2.3 species/transect in Phase 8 to 8.5 species/transect in Phase 6. Mean number of stems per transect was 47, ranging from 17.8/transect in Phase 2 to 81.4/transect in Phase 8.

Nuxia congesta was the most common species of tree along these transects, comprising 15.8 % of the stems, followed by Juniperus procera (14.4 %), Olea europaea (12.6 %), Podocarpus latifolius (7.2 %) and Neoboutonia macrocalyx (5.7 %). Nine species of tree were found only along one transect and eight species of tree were found along but two transects.

This report provides data for each transect, and on the location of each transect. Therefore, these transects can be revisited from time to time and new data obtained. These data will be useful for monitoring vegetation changes at each site, and thus for evaluating the impact of conservation activities around the Aberdares ecosystem, in particular that of the wildlife fence.

METHODS

Ninety-three vegetation belt-transects were conducted. Most of these were located near the existing or proposed fence-line. Well defined features that could be located on the map usually served as transect starting points. Such landmarks included National Park and Forest Reserve access points, road intersections, bridges and points where the fence-line abruptly changed direction. In areas where clear landmarks were not present, coordinate from 1:50,000 maps or GPS readings were used.

From each starting point, the direction was taken using a compass. A map of the area with the landmarks and the compass direction was drawn and altitude recorded. If an area contained more than one discernible vegetation type, each vegetation type was sampled separately. That is, each transect was conducted within a particular vegetation type and did not run across vegetation types.

The belt-transects measured 10 m x 120m (0.12 ha plots) except for transects 1, 2 and 3 which measured 5 m x 120 m (0.06 ha plots). Long, narrow plots have increased edge effect problems. Smaller plots more effectively address the problem of tree clumping. However, because of the limited availability of

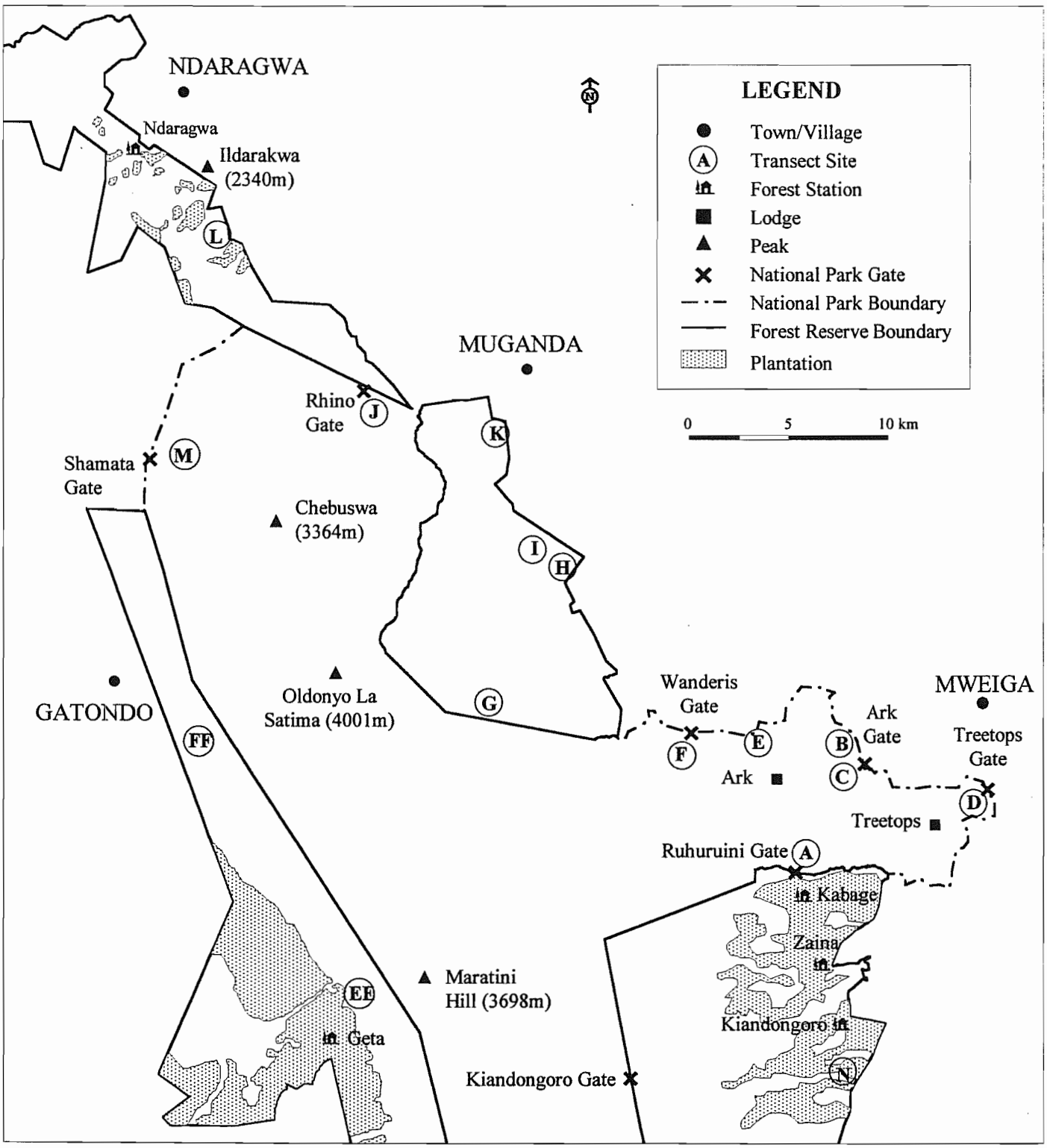
obvious landmarks, long, narrow plots were preferred to maximize variation within the fewest number of plots.

All woody plants within the belt-transect with a dbh (1.3 m above ground) of 10 cm or greater were identified by species, measured and recorded. For multiple stemmed individuals, the stems were measured separately if forking occurred below 1.3 m but taken as one stem if the forking occurred above 1.3 m. If forking caused swelling at the 1.3 m mark, the diameter was taken immediately below the swelling. Diameters of buttressed stems were taken above the buttresses.

Table 9. Key to Map 18. Tree belt-transect sites for the Aberdares Wildlife Fence Placement Study, Kenya (1997-98).

Phase	Site	Transects	Location
1	A	1,2,3	Ruhuruini Gate
	B	4,5,6,7	Ruhutii River Camp
	C	8,9,10,11	Ark Gate
	D	12,13	Treetops Gate
	E	14,15,16,17	Honi River Camp
	F	18,19	Park Sub-Headquarters
2	G	20,21,22,23,24,25,29	Gakanga Ranger Station
	H	26,27	Watuka Gate
	I	28	Embaringo
3	J	30,31,33,35,36	Rhino Gate
	K	32	Muganda
	L	34	Ndaragwa
	M	37,38,39,40,41, 42,43,44,45,46	Shamata Gate
4	N	47,48	Hubuini Forest Guard Post
	O	49,50,51,52,53	Thuti Forest Guard Post
	P	54	Karurumo Forest Guard Post
	Q	55	Wanjerere Forest Station
5	R	56	Gatare
	S	57,58	Mununga
	T	59	Wanyaga
	W	62	Gatamayu
	AA	69	Gatamayu
6	U	60	Kieni Forest Station
	V	61	Kerita
	X	63	Thiririka
	Z	68	Ragia Forest Station
7	Y	64,65,66,67	S. Kinangop Forest Station
	BB	70,71,72,73,74,75,76	Mutarakwa Forest Station
	CC	77,78	Kitiri
	DD	79,80,81,82,83,84	Mutubio Gate
	EE	85,86,87,88,89	Geta Forest Station
8	FF	90,91,92,93	Wanjohi Area

Map 18. Sites where tree belt - transects were conducted in the Aberdares Conservation Area, Kenya (1997 - 98). See Table 9.



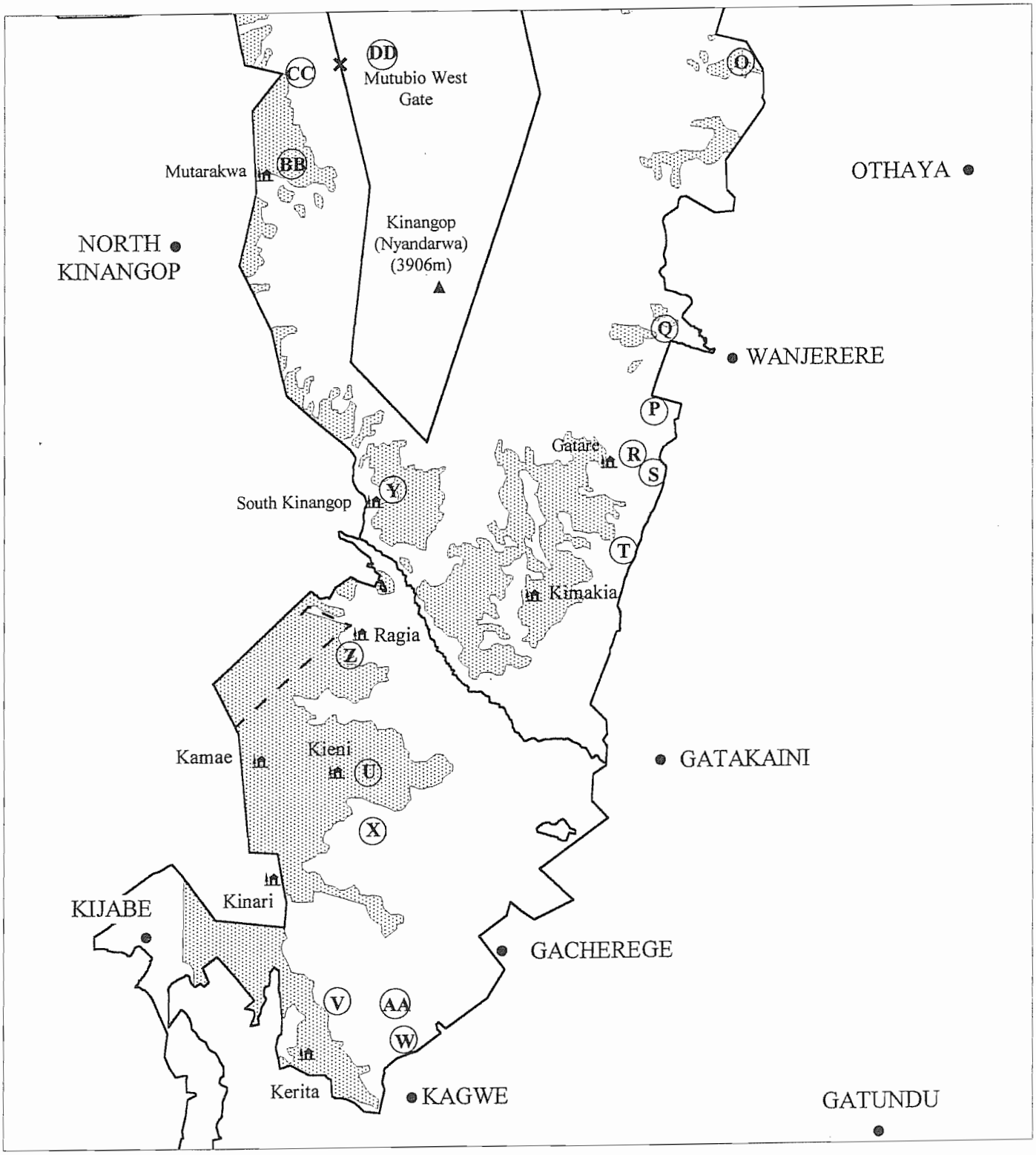

DD
Mutubio West Gate
CC
Mutarakwa
BB
NORTH KINANGOP
Kinangop (Nyandarwa) (3906m)
O
OTHAYA
Q
WANJERERE
P
Gatare
R
S
Y
South Kinangop
T
Kimakia
Ragia
Z
Kamae
Kieni
U
X
GATAKAINI
KIJABE
Kinari
GACHEREGE
V
AA
W
Kerita
KAGWE
GATUNDU

Table 10. Summary of tree species richness and density of stems along each of eight phases of the proposed wildlife fence around the Aberdares ecosystem, Kenya. Data obtained from 93 belt-transects (1997-98). Only trees with a dbh >10 cm were considered. See Table 9 and Map 18.

Phase	1	2	3	4	5	6	7	8	Total or mean
Number of transects	19	10	17	9	4	10	20	4	93
Total species	33	7	27	22	17	45	16	16	77
Mean species/ transect	6.8	2.3	5.8	7.8	8.5	9.5	4.0	6.5	5.9
Total stems	816	178	844	361	290	814	1057	99	4459
Mean stems/ transect	42.9	17.8	49.6	40.1	72.5	81.4	52.9	24.8	47.9

Table 11. Summary of data obtained on the abundance, distribution and elevation of species of tree (dbh >10cm) in the Aberdares ecosystem 1997-98, Kenya. Data obtained from 93 belt-transects.

Rank	Species	No. of transects where found	% of transects where present	No. of stems	% of total stems	Elevation (feet)	Wetter forest	Drier forest
1	*Nuxia congesta*	54	58.1	703	15.8	6900 - 9800	+	+
2	*Juniperus procera*	39	41.9	641	14.4	6900 - 9800	-	+
3	*Olea europaea*	39	41.9	560	12.6	6300 - 9800	-	+
4	*Podocarpus latifolius*	34	36.7	319	7.2	6900 - 9800	+	+
5	*Neoboutonia macrocalyx*	18	19.4	253	5.7	7200 - 8300	+	-
6	*Elaeodendron buchananii*	13	14.0	162	3.6	8200 - 9300	-	+
7	*Macaranga kilimandscharica*	14	15.1	162	3.6	7200 - 8300	+	-
8	*Olinia rochetiana*	20	21.5	142	3.2	6900 - 6900	-	+
9	*Psychotria mahonii*	13	14.0	111	2.5	7400 - 8300	+	-
10	*Cassipourea malosana*	19	20.4	113	2.5	6300 - 8300	+	+
11	*Teclea simplifolia*	9	9.7	105	2.3	6900 - 8100	-	+
12	*Tabernaemontana pachysiphon*	14	15.1	103	2.3	7200 - 8300	+	-
13	*Dombeya torrida*	3	3.2	86	1.9	7500 - 9650	+	+
14	*Galiniera saxifraga*	11	11.8	75	1.7	7200 - 8300	+	-
15	*Hagenia abyssinica*	9	9.6	70	1.6	8400 - 10300	+	+
16	*Hypericum revolutum*	14	15.1	63	1.4	8400 - 10300	+	+
17	*Olea capensis*	13	14.0	51	1.1	7500 - 9200	+	+
18.5	*Euclea divinorum*	3	3.2	44	1.0	8000 - 8300	-	+
18.5	*Vangueria infausta*	11	11.8	44	1.0	6900 - 7500	+	+
20.5	*Ehretia cymosa*	11	11.8	36	0.8	6300 - 7500	-	+
20.5	*Xymalos monospora*	8	8.6	36	0.8	7200 - 8300	+	-
22	*Suregada procera*	3	3.2	35	0.8	7200 - 8300	+	-
23	*Canthium oligocarpum*	3	3.2	33	0.7	7600 - 8200	-	+
24	*Fagaropsis angolensis*	8	8.6	31	0.7	6300 - 7600	-	+
25	*Schefflera volkensii*	8	8.6	26	0.6	7400 - 9200	+	-
26.5	*Trimeria grandifolia*	5	5.4	25	0.6	7400 - 9200	-	+

Table 11. (continued).

Rank	Species	No. of transects where found	% of transects where present	No. of stems	% of total stems	Elevation (feet)	Wetter forest	Drier forest
26.5	*Erica arborea*	3	3.2	25	0.6	8400 - 9800	+	+
28	*Cussonia spicata*	2	2.2	23	0.5	7300 - 7400	-	-
30	*Lepidotrichilia volkensii*	8	8.6	21	0.5	72000 - 8000	+	-
30	*Calodendrum capense*	6	6.5	21	0.5	6900 - 7500	-	+
30	*Ochna holstii*	4	4.3	21	0.5	7200 - 7700	+	-
33.5	*Oncoba spinosa*	4	4.3	18	0.4	6900 - 9200	-	+
33.5	*Bersama abyssinica*	2	2.2	18	0.4	6300 - 7300	+	+
33.5	*Dracaena steudneri*	2	2.2	18	0.4	7400 - 7700	+	-
33.5	*Stoebe kilimandscharica*	5	5.4	18	0.4	10000 - 10300	+	+
36.5	*Ochna ovata*	6	6.5	15	0.3	7200 - 8300	+	-
36.5	*Maytenus heterophylla*	7	7.5	15	0.3	8000 - 8400	-	+
39	*Ritchiea albersii*	6	6.5	14	0.3	6900 - 7500	-	+
39	*Syzygium guineense*	5	5.4	14	0.3	7200 - 7700	+	-
39	*Ekebergia capensis*	11	11.8	14	0.3	6900 - 9100	+	+
41	*Apodytes dimidiata*	6	6.5	11	0.2	7400 - 8300		
42.5	*Clausena anisata*	3	3.2	10	0.2	6900 - 8000	+	+
42.5	*Buddleia polystachya*	6	6.5	10	0.2	7300 - 9050	-	+
44.5	*Diospyros abyssinica*	2	2.2	9	0.2	6300 - 7700	-	+
44.5	*Aningeria adolfi-friedericii*	1	1.0	9	0.2	7500 - 7500	+	-
46	*Psydrax schimperiana*	1	1.0	8	0.2	6300 - 6300	-	+
49	*Albizia gummifera*	4	4.3	7	0.2	6900 - 8300	+	+
49	*Ocotea usambarensis*	2	2.2	7	0.2	7400 - 7500	+	-
49	*Warburgia ugandensis*	2	2.2	7	0.2	6300 - 8100	-	+
49	*Acacia melanoxylon*	3	3.2	7	0.2	7200 - 8400	+	+
49	*Agauria salicifolia*	3	3.2	7	0.2	7900 - 8400	+	+
53.5	*Ilex mitis*	5	5.4	6	0.1	6300 - 8200	-	+
53.5	*Rapanea melanophloeos*	5	5.4	6	0.1	8400 - 9300	+	+

Table 11. (continued).

Rank	Species	No. of transects where found	% of transects where present	No. of stems	% of total stems	Elevation (feet)	Wetter forest	Drier forest
53.5	*Rhamnus prinoides*	5	5.4	6	0.1	6900 - 8500	-	+
53.5	*Lepidotrichilia ametica*	1	1.0	6	0.1	8250-8500	+	-
56.5	*Afrocrania volkensii*	2	2.2	5	0.1	7200 - 9050	+	-
56.5	*Teclea nobilis*	4	4.3	5	0.1	6900 - 8100	+	+
58	*Lasianthus kilimandsharicus*	3	3.2	4	0.1	7200 - 7700	+	-
61.5	*Chrysophyllum gorungosanum*	2	2.2	3	0.1	7200 - 7700	+	-
61.5	*Caesaria battiscombei*	2	2.2	3	0.1	7500 - 7700	+	-
61.5	*Polyscias kikuyuensis*	1	1.0	3	0.1	7400 - 8200	+	+
61.5	*Celtis africana*	2	2.2	3	0.1	7400 - 7600	-	+
61.5	*Peddiea fischeri*	2	2.2	3	0.1	7200 - 8000	+	-
61.5	*Pinus patula*	2	2.2	3	0.1	7200 - 7700	+	-
68.5	*Halleria lucida*	1	1.0	2	<0.1	7400 - 7650	+	-
68.5	*Podocarpus falcatus*	2	2.2	2	<0.1	9000 - 9300	-	+
68.5	*Allophylus abyssinicus*	1	1.0	2	<0.1	8200 - 8400	-	+
68.5	*Macaranga capensis*	1	1.0	2	<0.1	7200 - 7500	+	-
68.5	*Rhus natalensis*	1	1.0	2	<0.1	8000 - 8400	-	+
68.5	*Pygeum africana*	1	1.0	2	<0.1	8300 - 8300	-	+
68.5	*Zanthoxylum usambarense*	1	1.0	2	<0.1	6300 - 6300	+	+
68.5	*Faurea saligna*	2	2.2	2	<0.1	9200 - 9300	+	-
77	*Dodonaea viscosa*	1	1.0	1	<0.1	8100 - 8100	-	+
77	*Euphorbia candelabrum*	1	1.0	1	<0.1	7300 - 7300	-	+
77	*Drypetes gerrardii*	1	1.0	1	<0.1	8500 - 8500	-	+
77	*Strombosia scheffleri*	1	1.0	1	<0.1	7200 - 7200	+	-
77	*Senna didymobotrya*	1	1.0	1	<0.1	8350 - 8350	-	+
77	*Vernonia sp.*	1	1.0	1	<0.1	9300 - 9300	-	+
77	*Toddalia asiatica*	1	1.0	1	<0.1	8000-8500	+	-
77	*Trimeria sp.*	1	1.0	1	<0.1	8000-8500	-	+
77	*Unidentified sp.*	1	1.0	1	<0.1	8100 - 8100	-	+

Table 12. Abundance of species of trees (dbh >10cm) in each phase of the wildlife fence around the Aberdares ecosystem, Kenya, as determined by belt-transects (1997-98).

Phase 1 Fence (transects 1-19).

Rank	Species	No. of transects where present	% of transects where present	No. of stems	% of total stems
1	*Olea europaea*	8	42	108	13.2
2	*Teclea simplifolia*	8	42	95	11.6
3	*Cassipourea malosana*	14	74	94	11.5
4	*Nuxia congesta*	6	32	85	10.4
5	*Podocarpus latifolius*	7	37	80	9.8
6	*Vangueria infausta*	11	58	44	5.4
7.5	*Neoboutonia macrocalyx*	3	16	36	4.4
7.5	*Ehretia cymosa*	11	58	36	4.4
9	*Fagaropsis angolensis*	8	42	31	3.8
10	*Juniperus procera*	3	16	29	3.6
11	*Cussonia spicata*	1	5	22	2.7
12	*Calodendrum capense*	6	32	21	2.6
13	*Bersama abyssinica*	2	11	18	2.2
14	*Oncoba spinosa*	3	16	17	2.1
15	*Ritchiea albersii*	6	32	14	1.7
16	*Olinia rochetiana*	3	16	12	1.5
17.5	*Tabernaemontana pachysiphon*	2	11	9	1.1
17.5	*Diospyros abyssinica*	2	11	9	1.1
19.5	*Clausena aniseta*	2	11	8	1.0
19.5	*Psydrax schimperiana*	1	5	8	1.0
21	*Ekebergia capensis*	5	26	7	0.9
22	*Warburgia ugandensis*	1	5	6	0.7
23	*Ilex mitis*	4	21	5	0.6
24	*Lepidotrichilia volkensii*	2	27	4	0.5
26	*Albizia gummifera*	1	5	3	0.4
26	*Polyscias kikuyunsis*	1	5	3	0.4
26	*Celtis africana*	2	11	3	0.3
28	*Casaeria battiscombei*	1	5	2	0.3
28	*Zanthoxylum usambarense*	1	5	2	0.3
28	*Apodytes dimidiata*	1	5	2	0.2
31	*Teclea nobilis*	1	5	1	0.1
31	*Dombeya torrida*	1	5	1	0.1
31	*Euphorbia candelabrum*	1	5	1	0.1
Total	33	129	-	816	100.0

Table 12. (continued). Phase 2 Fence (transects 20-29).

Rank	Species	No. of transects where present	% of transects where present	No. of stems	% of total stems
1	*Nuxia congesta*	8	80	74	41.6
2	*Juniperus procera*	4	40	52	29.2
3	*Podocarpus latifolius*	5	50	25	14.0
4	*Olea europaea*	3	30	21	11.8
5	*Afrocrania volkensii*	1	10	4	2.3
6.5	*Buddleia polystachya*	1	10	1	0.6
6.5	*Olea capensis*	1	10	1	0.6
Total	7	23	-	178	100.0

Table 12. (continued). Phase 3 Fence (transects 30-46).

Rank	Species	No. of transects where present	% of transects where present	No. of stems	% of total stems
1	*Olea europaea*	16	94	238	28.2
2	*Nuxia congesta*	11	65	160	19.0
3	*Juniperus procera*	15	88	139	16.5
4	*Podocarpus latifolius*	6	35	90	10.7
5	*Olinia rochetiana*	9	53	43	5.1
6	*Olea capensis*	8	41	42	5.0
7	*Euclea divinorum*	4	24	38	4.5
8	*Elaeodendron buchananii*	3	18	26	3.1
9	*Trimeria grandifolia*	5	29	25	3.0
10	*Teclea simplifolia*	1	6	10	1.2
12	*Maytenus heterophylla*	2	12	4	0.5
12	*Rapanea melanophloeos*	3	18	4	0.5
12	*Hypericum revolutum*	2	12	4	0.5
14.5	*Teclea nobilis*	1	6	3	0.4
14.5	*Dombeya torrida*	1	6	3	0.4
17	*Rhus natalensis*	1	6	2	0.2
17	*Ekebergia capense*	1	6	2	0.2
17	*Podocarpus falcatus*	1	6	2	0.2
22.5	*Toddalia asiatica*	1	6	1	0.1
22.5	*Trimeria sp.*	1	6	1	0.1
22.5	*Dodonaea viscosa*	1	6	1	0.1
22.5	*Oncoba spinosa*	1	6	1	0.1
22.5	*Schefflera volkensii*	1	6	1	0.1
22.5	*Hagenia abyssinica*	1	6	1	0.1
22.5	*Faurea saligna*	1	6	1	0.1
22.5	*Trimeria sp.*	1	6	1	0.1
Total	27	98	-	844	100.0

Table 12. (continued). Phase 4 Fence (transects 47-55).

Rank	Species	No. of transects where present	% of transects where present	No. of stems	% of total stems
1	*Nuxia congesta*	5	56	87	24.1
2	*Neoboutonia macrocalyx*	6	68	54	15.0
3	*Tabernaemontana pachysiphon*	6	67	40	11.1
4	*Podocarpus latifolius*	6	67	32	8.9
5	*Macaranga kilimandscharica*	5	57	27	7.5
6	*Galiniera saxifraga*	6	67	20	5.5
7	*Xymalos monospora*	5	56	18	5.0
8	*Psychotria mahonii*	5	56	13	3.6
9	*Ochna ovata*	4	44	12	3.3
10	*Dracaena steudneri*	1	11	11	3.0
11	*Cassipourea malosana*	3	33	9	2.5
12	*Schefflera volkensii*	4	44	7	2.0
13.5	*Euclea divinorum*	1	11	6	1.7
13.5	*Lepidotrichilia emetica*	1	11	6	1.7
16	*Albizia gummifera*	3	33	4	1.1
16	*Agauria salicifolia*	1	11	4	1.1
16	*Syzygium guineense*	1	11	4	1.1
18.5	*Ekebergia capensis*	2	22	2	0.6
18.5	*Apodytes dimidiata*	2	22	2	0.6
21	*Suregada procera*	1	11	1	0.3
21	*Lepidotrichilia volkensii*	1	11	1	0.3
21	*Rapanea melanoploeos*	1	11	1	0.3
Total	22	70	-	361	100.0

Table 12. (continued). Phase 5 Fence (transects 56-59).

Rank	Species	No. of transects where present	% of transects where present	No. of stems	% of total stems
1	*Neoboutonia macrocalyx*	4	100	72	24.8
2	*Psychotria mahonii*	4	100	62	21.4
3	*Galiniera saxifraga*	3	75	52	17.9
4	*Macaranga kilimandscharica*	4	100	36	12.4
5	*Tabernaemontana pachysiphon*	4	100	24	8.3
6	*Podocarpus latifolius*	3	75	13	4.5
7.5	*Nuxia congesta*	1	25	7	2.4
7.5	*Dracaena steudneri*	1	25	4	1.4
9	*Xymalos monospora*	1	25	3	1.0
12	*Ekebergia capensis*	2	50	2	0.7
12	*Halleria lucida*	1	25	2	0.7
12	*Lepidotrichilia volkensii*	1	25	2	0.7
12	*Syzygium guineense*	1	25	2	0.7
12	*Ochna ovata*	1	25	2	0.7
16	*Agauria salicifolia*	1	25	1	0.3
16	*Ochna holstii*	1	25	1	0.3
16	*Lasianthus kilimandscharicus*	1	25	1	0.3
Total	17	34	-	290	100.0

Table 12. (continued). Phase 6 Fence (transects 60-69).

Rank	Species	No.of transects where present	% of transects where present	No. of stems	% of total stems
1	*Juniperus procera*	5	50	116	14.3
2	*Macaranga kilimandscharica*	3	50	99	12.2
3	*Neoboutonia macrocalyx*	5	50	91	11.2
4	*Nuxia congesta*	5	50	82	10.1
5	*Podocarpus latifolius*	6	60	79	9.7
6	*Psychotria mahonii*	4	40	36	4.4
7	*Suregada procera*	2	20	34	4.2
8	*Canthium oligocarpum*	3	30	33	4.1
9	*Tabernaemontana pachysiphon*	3	30	30	3.7
10	*Erica arborea*	2	20	24	3.0
11	*Hagenia abyssinica*	1	10	21	2.6
12	*Ochna holstii*	3	30	20	2.5
13	*Schefflera volkensii*	3	30	18	2.2
14.5	*Lepidotrichilia volkensii*	3	30	14	1.7
14.5	*Xymalos monospora*	2	20	14	1.7
16	*Cassipourea malosana*	2	20	10	1.2
17	*Aningeria adolfi-friedericii*	1	10	9	1.1
18	*Syzygium guineense*	3	30	8	1.0
19.5	*Ocotea usambarensis*	2	20	7	0.9
19.5	*Apodytes dimidiata*	3	30	7	0.9
21	*Olea capensis*	1	10	6	0.7
23	*Hypericum revolutum*	2	20	5	0.6
23	*Acacia melanoxylon*	2	20	5	0.6
23	*Olea europaea*	2	20	5	0.6
25	*Buddleia polystachya*	2	20	4	0.5
29	*Chrysophylum gorungosanum*	2	20	3	0.4
29	*Lasianthus kilimandscharicus*	2	20	3	0.4
29	*Peddiea fischeri*	2	20	3	0.4
29	*Galiniera saxifraga*	2	20	3	0.4
29	*Dombeya torrida*	1	10	3	0.4
29	*Pinus patula*	2	20	3	0.4
34	*Macaranga capensis*	1	10	2	0.2
34	*Clausena anisata*	1	10	2	0.2
34	*Pygeum africanum*	1	10	2	0.2
34	*Allophylus abyssinicus*	1	10	2	0.2

Table 12. (continued). Phase 6 Fence (continued).

Rank	Species	No.of transects where present	% of transects where present	No. of stems	% of total stems
34	*Agauria salicifolia*	1	10	2	0.2
41	*Strombosia scheffleri*	1	10	1	0.1
41	*Teclea nobilis*	1	10	1	0.1
41	*Afrocrania volkensii*	1	10	1	0.1
41	*Ochna ovata*	1	10	1	0.1
41	*Rapanea melanophloeos*	1	10	1	0.1
41	*Rhamnus prinoides*	1	10	1	0.1
41	*Drypetes gerrardii*	1	10	1	0.1
41	*Ilex mitis*	1	10	1	0.1
41	*Casaeria battiscombei*	1	10	1	0.1
Total	45	95	-	814	100.0

Table 12. (continued). Phase 7 (transects 70-89).

Rank	Species	No. of transects where present	% of transects where present	No. of stems	% of total stems
1	*Juniperus procera*	11	55	293	27.7
2	*Nuxia congesta*	14	65	191	18.1
3	*Olea europaea*	7	35	187	17.7
4	*Elaeodendron buchananii*	6	30	130	12.3
5	*Olinia rochetiana*	5	25	65	6.2
6	*Dombeya torrida*	8	40	62	5.9
7	*Hypericum revolutum*	9	45	53	5.0
8	*Hagenia abyssinica*	6	30	47	4.5
9	*Stoebe kilimandscharica*	5	25	18	1.7
10	*Rhamnus prinoides*	2	10	4	0.4
11	*Acacia melanoxylon*	1	5	2	0.2
14	*Olea capensis*	1	5	1	0.1
14	*Erica arborea*	1	5	1	0.1
14	*Ekebergia capensis*	1	5	1	0.1
14	*Faurea saligna*	1	5	1	0.1
14	*Vernonia sp.*	1	5	1	0.1
Total	16	79	-	1057	100.0

Table 12. (continued). Phase 8 (transects 90-93).

Rank	Species	No.of transects where present	% of transects where present	No. of stems	% of total stems
1	*Olinia rochetiana*	2	50	22	22.2
2.5	*Nuxia congesta*	3	75	17	17.2
2.5	*Dombeya torrida*	3	75	17	17.2
4	*Juniperus procera*	3	75	12	12.1
5	*Maytenus heterophylla*	2	50	11	11.1
6	*Elaeodendron buchananii*	2	50	6	6.1
7	*Buddleia polystachya*	2	50	5	5.1
12	*Hypericum revolutum*	1	25	1	1.0
12	*Senna didymobotrya*	1	25	1	1.0
12	*Hagenia abyssinica*	1	25	1	1.0
12	*Olea europaea*	1	25	1	1.0
12	*Olea capensis*	1	25	1	1.0
12	*Cussonia spicata*	1	25	1	1.0
12	*Warburgia ugandensis*	1	25	1	1.0
12	*Rhamnus prinoides*	1	25	1	1.0
12	*Unidentified sp.*	1	25	1	1.0
Total	16	26	-	99	100.0

Table 13. Rare and endemic species of plants of the Aberdare ecosystem, Kenya (Agnew & Agnew, 1994; Beentje, 1994).

Species	Life form	Rare	Endemic *		Altitude (m)	Habitat
			AE	AE& MK		
Alchemilla hageniae	Herb/ shrub		+		3000-3600	*Erica* woodland, stream edges
Asplenium praegracile	Fern	+			2920	Dense shade near streams
Barbarea intermedia	Herb	+			3000-3900	Lower edge of alpine zone
Carduus sylvarum	Herb			+	1740-2500	Deep forest shade
Crotalaria jacksonii	Shrub	+			2200-3000	Forest margins
Fragaria vesca	Herb	+			High	Found once
Galium thunbergianum	Herb	+			2050-3750	Wet montane forest
Helichrysum brownei	Shrub			+	3500-3900	Shrubby vegetation on drier sides
Helichrysum chionoides	Shrub			+	3000-3900	Alpine zone, bogs , stream sides
Helichrysum gloria-dei	Shrub		+		3490-4000	Alpine zone
Helichrysum guilelmi	Shrub	+			3300-3820	Upper forest
Isoglossa substrobilina	Herb	+			1600-2200	Rain forest, montane forest
Lactuca paradoxa	Herb	+			2900	Montane forest
Leucas volkensii	Herb	+			1990-3090	Upland forest
Lobelia bambuseti	Shrub	+		+	2700-4000	*Podocarpus*/ bamboo forest, hearthland
Lobelia deckenii	Herb		+		3350-3850	Wet moorland
Ophioglossum sp.A	Fern	+	+		3300	Bog
Phragmanthera regularis	Shrub	+			2100-2530	*Juniperus* forest
Rubus friesiorum	Shrub	+			3000-3400	Forest edge
Secamone alpini	Woody climber	+			2150	Limuru
Senecio johnstonii	Shrub			+	2500-3800	Swampy sites in alpine zone

Table 13. (continued).

Species	Life form	Rare	Endemic*		Altitude (m)	Habitat
			AE	AE& MK		
Senecio keniensis	Shrub	+	+		3000-3800	Swampy sites in moorland
Senecio maranguensis	Shrub	+			2720-2950	Upper forest edge
Smilax aspera	Climber	+			2200	Evergreen upland forest
Solanum sp.J	Herb/ shrub	+			2170-2400	Clearings in mountain forest
Stellaria mannii	Herb	+			1550-2250	Shady path sides
Valeriana kilimandscharica	Herb		+		3100-3800	Alpine zone
Vernonia pteropoda	Shrub	+			1800-2750	Wet montane forest undergrowth

*AE and MK = Aberdares ecosystem and Mount Kenya.

ENDEMIC AND RARE PLANTS.

Species of plants endemic to the Aberdares ecosystem, or rare, are mostly found at high elevations (alpine zone). At the low altitude of the fence-line, the probability of encountering an endemic plant is low. It is at the lower altitude where man's impact on the forest is greatest. Therefore, heavily exploited species with low regeneration capability and restricted distribution are the most vulnerable at the fence-line.

Ocotea usambarensis and *Podocarpus falcatus* are in this category. Both are affected by pit-sawyers and heavily exploited in the Aberdares. *O. usambarensis* has been reported to have regeneration problems (Kigumo, 1987), while *P. falcatus* is largely restricted to the northern Aberdares (Schmitt, 1991). Data from this survey are not adequate to plot the relative frequency of *O. usambarensis*, but no stem of diameter <50 cm was recorded. Data from earlier survey shows a semi-bimodal distribution for the whole Aberdares ecosystem, with most stems being of lower and upper class diameter (FAO, 1994). The distribution suggests either periodic regeneration or selective removal of the mid-diameter stems (very big stems usually have heart rots while pole sized ones are not suitable for lumber).

Table 14. Orchids that are of conservation concern in the Aberdares Conservation Area, Kenya. This list was provided by B. Bytebier, East African Herbarium, National Museums of Kenya (1999).

Name	District	Location in Aberdares	Elevation (m)	Notes
Angraecum chamaeanthus	Nyandarua	Sasumua Dam	2340	Tanzania, Burundi, Malawi, Transvaal, Zimbabwe. Kenya also in Elgeyo, Taita Hills.
Angraecum decipiens	Kiambu, Nyeri	Not Aberdares but near	1890-2042	Tanzania. Kenya: Karen /Langata, Kijabe, Mweiga Estate
Angraecum humile	Several in Aberdares	S. Mathioya River	2439	Tanzania, Rwanda , Zimbabwe. Kenya also Kericho, Taita Hills, Kakamega. Restricted to wet forest.
Bonatea volkensiana	Nyeri	Naro Moru R. Lodge (not Aberdares but near)	-	Kenya and Tanzania endemic.
Diaphananthe montana	Kiambu	Kinale	2480	Kenyan endemic. Restricted to forest ≥ 2300 m.
Disa fragrans ssp. *deckenii*	Nyeri, Nyandarua	Karuru Falls, Sasumua Dam	2814-2500	Kenya,Tanzania, Uganda, Ethiopia, Sudan, Zaire. Highlands ≥ 2100 m. Uncommon.
Disperis kilimanjarica	Kiambu	Karimenu River, Gatamayu Forest	2591	Kenya, Uganda, Tanzania, Rwanda, Burundi, Malawi, Zambia. Montane forest and bamboo.
Habenaria keniensis	Nyandarua	Kinangop	2439-2682	Kenyan endemic. Forest margins ≥ 1950m.
Habenaria linderi	Nyandarua	Sasumua Dam	2400-2469	Kenya, Uganda, Burundi. Grasslands ≥ 2100m .
Holothrix pentadactyla	Several in Aberdares	E. Aberdares	2865	Kenyan endemic. Upland grassland and rocky ground. Only in Aberdares, Mt. Kenya, Mau, Cherangani.

Table 14. (continued).

Name	District	Location in Aberdares	Elevation (m)	Notes
Polystachya bicarinata	Muranga	Tuso Forest	2591	Uganda, Zaire, Rwanda, Burundi. Kenya also Elgeyo, Kericho, Cherangani, ≥ 1800m.
Polystachya caespitifica ssp. *latilabris*	Kiambu, Nyandarua, Muranga	Karimenu River, Sasumua Dam, Tuso Forest	-	Subspecies endemic to wet forest of Kenya and Tanzania.
Polystachya heckmanniana	Nyandarua	Kinangop Forest	-	Tanzania, Malawi. Upland moist forests. In Kenya only in Aberdares.
Satyrium fimbriatum	Nakuru, Nyandarua, Aberdares (several)	Gilgil, Kinangop, moorlands	1829-2804	Kenya, Tanzania, Uganda, Sudan. Open grassland, near streams, forest edges, stony slopes, rocky legdes, ≥ 2000 m.
Sphyrarhynchus schliebenii	Thika	West of Thika	1600	Tanzania, endemic to Mt. Meru and East Usambaras. According to Stewart (1996), also in Aberdares (but needs confirmation).
Tridactyle furcistipes	Nyandarua	Kinangop	2560-2682	Tanzania, Uganda. Kenya also Cheranganis, Mt. Kenya, Mau, Tinderet, Karisia Hills. Highland forest.

Table 15. Summary of information on exploitation and uses of trees in the Aberdares ecosystem, Kenya (1997-98).

Rank	Species	Where most abundant	Where most exploited	Uses
1	*Nuxia congesta*	Higher elevation (>8000 ft) all over Aberdares	Little pressure	–
2	*Juniperus procera*	Northern and western Aberdares	Ndaragwa, Geta, Shamata, Wanjohi. Big stems almost depleted at Geta and Wanjohi	Posts, lumber
3	*Olea europaea*	Northern and western Aberdares	Ndaragwa, Geta, Rhino Gate, Wanjohi. Big stems almost depleted at Geta and Wanjohi	Firewood, charcoal
4	*Podocarpus latifolius*	Higher elevation (>8000 ft) especially at Sub-Headquarters, Shamata, and S. Kinangop	Shamata, Thuti. Systematically being felled along forest roads at Thuti.	Lumber
5	*Neoboutonia macrocalyx*	Disturbed high rainfall areas. Salient to Kieni	Kamae, Kieni, Kinale, Gatamayu	Poles (construction industry, Nairobi)
6	*Elaeodendron buchananii*	Ridge tops prone to fire especially in North Kinangop	Little pressure	–
7	*Macaranga kilimandscharica*	Disturbed high rainfall areas. Kiandongoro to Kieni	Kieni, Gatamayu, Kinale	Poles (construction industry, Nairobi)

Table 15. (continued).

Rank	Species	Where most abundant	Where most exploited	Uses
8	*Olinia rochetiana*	Rhino Gate, North Kinangop, Geta, Wanjohi	Little pressure	–
9	*Psychotria mahonii*	Disturbed high rainfall areas. Kiandongoro to Kieni	Kamae, Kieni, Kinale, Gatamayu	Poles (construction industry, Nairobi)
10	*Cassipourea malosana*	Salient	Little pressure	-
11	*Teclea simplifolia*	Ark Gate (Salient), Mugaka, Ndaragwa	Little pressure	–
12	*Tabernaemontana pachysiphon*	High rainfall areas. Ruhuruini Gate, Kiandongoro to Kieni	Little pressure	–
13	*Dombeya torrida*	River valleys and depressions. Shamata, N. Kinangop, Geta, Wanjohi	Little pressure	–
14	*Galiniera saxifraga*	High rainfall areas. Kiandongoro to Kieni	Little pressure	–
15	*Hagenia abyssinica*	Above the bamboo zone	Geta, Wanjohi	Lumber
16	*Hypericum revolutum*	Shamata, S. Kinangop, Geta	Little pressure	–

Table 15. (continued).

Rank	Species	Where most abundant	Where most exploited	Uses
17	*Olea capensis*	Shamata, Rhino Gate	Shamata	Lumber
18.5	*Euclea divinorum*	Rhino Gate	Little pressure	–
18.5	*Vangueria infausta*	Ark Gate	Little pressure	–
20.5	*Ehretia cymosa*	Ark Gate	Little pressure	–
20.5	*Xymalos monospora*	Forest edge in high rainfall areas. Ruhuruini Gate, Kiandongoro to Kieni	All places it occurs	Construction posts, beehives
22	*Suregada procera*	Understorey of little disturbed forest in high rainfall areas	Kieni, Gatamayu	Building posts
23	*Canthium oligocarpum*	S. Kinangop	Little pressure	–
25	*Schefflera volkensii*	Bamboo zone	Little pressure	–
26.5	*Trimeria grandifolia*	Rhino Gate, Mugaka	Little pressure	–
26.5	*Erica arborea*	S. Kinangop	Little pressure	–

Table 15. (continued).

Rank	Species	Where most abundant	Where most exploited	Uses
28	*Cussonia spicata*	Honi River Camp (Salient)	Little pressure	–
30	*Lepidotrichilia volkensii*	Bamboo zone	Little pressure	–
30	*Calodendrum capense*	Ark Gate	Little pressure	–
30	*Ochna holstii*	Kiandongoro to Kieni	Kieni, Gatamayu	Firewood
33.5	*Oncoba spinosa*	Along rivers and depressions near Ark Gate	Little pressure	–
33.5	*Bersama abyssinica*	Ark Gate	Little pressure	–
33.5	*Dracaena steudneri*	Thuti, Mununga	Little pressure	–
33.5	*Stoebe kilimandscharica*	Moorland	Fire	Shamata, Mutubio gate
36.5	*Ochna ovata*	Kiandongoro to Kieni	Kieni , Gatamayu	Firewood
36.5	*Maytenus heterophylla*	Mugaka, N. Kinangop, Geta	Little pressure	–
39	*Ritchiea albersii*	Ark Gate	Little pressure	–
39	*Syzygium guineense*	Kieni, Gatamayu (forest edges)	Little pressure	–

Table 15. (continued).

Rank	Species	Where most abundant	Where most exploited	Uses
39	*Ekebergia capensis*	Ark Gate	Little pressure	–
41	*Apodytes dimidiata*	Gatamayu, Hubuini	Gatamayu	Lumber
42.5	*Clausena anisata*	Ark Gate	Little pressure	–
42.5	*Buddleia polystachya*	Geta	Little pressure	–
42.5	*Diospyros abyssinica*	Ark Gate	Little pressure	–
42.5	*Aningeria adolfi-friedericii*	High rainfall areas especially around Ruhuruini Gate and Gatamayu	Gatamayu	Lumber
46	*Psydrax schimperiana*	Tree Tops Gate	Little pressure	–
49	*Albizia gummifera*	Thuti	Little pressure	–
49	*Ocotea usambarensis*	Gatamayu	Eliminated at Thuti. Almost depleted at Kieni and Wanyaga	Lumber
49	*Warburgia ugandensis*	Tree Tops Gate	Almost depleted in other areas	Lumber
49	*Acacia melanoxylon*	Near *A. melanoxylon* plantations. S. Kinangop, Kieni	Little pressure	–

Table 15. (continued).

Rank	Species	Where most abundant	Where most exploited	Uses
49	*Agauria salicifolia*	Wanjerere, Gatare, S. Kinangop	Little pressure	–
53.5	*Ilex mitis*	Ark Gate	Little pressure	–
53.5	*Rapanea melanophloeos*	Above bamboo zone. Shamata	Shamata	Poles
53.5	*Rhamnus prinoides*	Ark Gate, S. Kinangop	Little pressure	–
53.5	*Lepidotrchilia ametica*	Gathima River	Little pressure	-
56.5	*Afrocrania volkensii*	High rainfall areas along waterways	Little pressure	–
56.5	*Teclea nobilis*	Ark Gate, Ndaragwa	Ndaragwa	Poles
58	*Lasianthus kilimandscharicus*	High rainfall areas. Wanyaga to Kieni	Kieni, Gatamayu	Stakes, withies
61.5	*Chrysophyllum gorungosanum*	Kieni	Kieni, Gatamayu	Lumber
61.5	*Casaeria battiscombei*	Forest margins in high rainfall areas	Little pressure	–

Table 15. (continued).

Rank	Species	Where most abundant	Where most exploited	Uses
61.5	*Polyscias kikuyuensis*	Honi River Camp (Salient), Kieni, Gatamayu, Kamae	Wherever it occurs	Roots (medicinal)
61.5	*Celtis africana*	Honi River Camp (Salient)	Little pressure	–
61.5	*Peddiea fischeri*	High rainfall areas	Little pressure	–
61.5	*Pinus patula*	In *P. patula* plantations	Little pressure	–
68.5	*Halleria lucida*	Thuti, Mununga	Little pressure	–
68.5	*Podocarpus falcatus*	Shamata	Shamata	Lumber
68.5	*Allophylus abyssinicus*	S. Kinangop	Little pressure	–
68.5	*Macaranga capensis*	Kieni	Kieni	Poles, firewood
68.5	*Rhus natalensis*	Rhino Gate	Little pressure	–
68.5	*Pygeum africana*	S. Kinangop, N. Kinangop, Wanjohi	Wanjohi	Lumber
68.5	*Zanthoxylum usambarense*	Rhino Gate, Gatamayu	Gatamayu, big stems almost depleted	Lumber

Table 15. (continued).

Rank	Species	Where most abundant	Where most exploited	Uses
68.5	*Faurea saligna*	High elevation fire prone areas, Shamata	Little pressure	–
77	*Dodonaea viscosa*	Rhino Gate, Ndaragwa	Little pressure	–
77	*Euphorbia candelabrum*	Honi River Camp (Salient)	Little pressure	–
77	*Drypetes gerrardii*	S. Kinangop	Little pressure	–
77	*Strombosia scheffleri*	Kieni	Kieni	Lumber
77	*Senna didymobotrya*	Highly degraded areas, Geta,	Little pressure	–
77	*Vernonia sp.*	Highly degraded areas, Geta	Little pressure	–
77	*Toddalia asiatica*	Rhino Gata	Little pressure	-
77	*Trimeria sp.*	Rhino Gate	Little pressure	-
77	*Unidentified sp.*	Wanjohi	Little pressure	–

Table 16. Summary of results of 93 tree belt transects in the Aberdares ecosystem, Kenya (1997-98). See Table 9 and Map 18.

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
1	*Neoboutonia macrocalyx*	3	30	25-33
	Lepidotrichilia volkensii	1	20	-
	Podocarpus latifolius	1	76	-
2	*Casaeria battiscombei*	2	33	18-48
	Tabernaemontana pachysiphon	6	17	14-36
	Cassipourea malosana	3	33	28-41
	Lepidotrichilia volkensii	3	14	10-20
	Neoboutonia macrocalyx	10	24	15-36
	Teclea nobilis	1	13	-
	Vangueria infausta	1	13	-
	Ekebergia capensis	2	57	41-74
3	*Cassipourea malosana*	2	37	33-41
	Podocarpus latifolius	1	61	-
	Tabernaemontana pachysiphon	3	12	10-13
	Neoboutonia macrocalyx	23	17	13-53
	Clausena anisata	3	13	10-18
	Vangueria infausta	3	13	13-13
	Podocarpus latifolius	2	27	20-33
	Dombeya torrida	1	6	-
4	*Ehretia cymosa*	11	14	10-20
	Fagaropsis angolensis	1	23	-
	Teclea simplifolia	17	15	10-20
	Calodendrum capense	8	25	10-41
	Diospyros abyssinica	7	15	10-20
	Vangueria infausta	11	13	10-20
	Ritchiea albersii	3	13	10-18
	Clausena anisata	5	12	10-18
	Cassipourea malosana	9	13	10-20
5	*Ilex mitis*	2	13	10-15
	Albizia gummifera	3	51	38-74

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
5	*Ekebergia capensis*	1	15	-
	Oncoba spinosa	3	18	15-20
	Ehretia cymosa	5	13	10-15
	Olea europaea	1	28	-
	Ritchiea albersii	1	18	-
	Teclea simplifolia	2	10	10-10
6	*Teclea simplifolia*	19	14	10-18
	Ekebergia capensis	2	11	10-13
	Vangueria infausta	1	10	-
	Ehretia cymosa	1	23	-
	Fagaropsis angolensis	2	17	13-20
	Olea europaea	1	64	-
	Podocarpus latifolius	1	36	-
	Cassipourea malosana	4	12	10-15
	Calodendrum capense	1	18	-
7	*Teclea simplifolia*	18	13	10-20
	Calodendrum capense	9	30	15-48
	Fagaropsis angolensis	4	16	10-18
	Cassipourea malosana	9	12	10-13
	Vangueria infausta	3	18	13-20
	Olinia rochetiana	5	30	25-51
	Nuxia congesta	1	51	-
	Olea europaea	3	41	28-51
8	*Calodendrum capense*	1	61	-
	Ehretia cymosa	4	15	13-18
	Ritchiea albersii	3	16	13-18
	Vangueria infausta	1	15	-
	Bersama abyssinica	6	12	10-18
	Cassipourea malosana	1	18	-
9	*Fagaropsis angolensis*	8	25	15-56
	Cassipourea malosana	3	20	15-25

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
9	*Ehretia cymosa*	1	13	-
	Vangueria infausta	2	14	14-14
	Ilex mitis	1	13	-
	Ritchiea albersii	2	18	18-18
10	*Oncoba spinosa*	10	16	10-23
	Ekebergia capensis	1	15	-
	Olea europaea	1	28	-
	Calodendrum capense	1	18	-
	Fagaropsis angolensis	3	43	13-61
	Teclea simplifolia	2	14	10-18
	Vangueria sp.	1	13	-
	Cassipourea malosana	1	13	-
	Ehretia cymosa	2	18	18-18
	Ritchiea albersii	3	14	13-15
11	*Vangueria infausta*	18	17	10-25
	Cassipourea malosana	32	14	10-23
	Teclea simplifolia	14	19	10-28
	Fagaropsis angolensis	4	20	15-30
	Ehretia cymosa	5	22	18-33
	Ritchiea albersii	2	24	18-25
	Oncoba spinosa	4	15	10-18
12	*Psydrax schimperiana*	8	15	10-30
	Olea europaea	18	15	13-20
	Ehretia cymosa	2	18	13-23
	Vangueria infausta	1	13	-
	Bersama abyssinica	12	19	10-23
	Calodendrum capense	1	30	-
13	*Zanthoxylum usambarense*	2	33	13-53
	Fagaropsis angolensis	6	26	18-33
	Ehretia cymosa	3	13	13-15
	Ilex mitis	1	10	-

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
13	*Cassipourea malosana*	3	12	10-15
	Warburgia ugandensis	6	24	23-30
	Diospyros abyssinica	2	32	18-41
14	*Juniperus procera*	8	36	18-53
	Olea europaea	22	27	15-51
	Teclea simplifolia	19	15	10-20
	Olinia rochetiana	4	18	15-20
	Ilex mitis	1	18	-
	Nuxia congesta	5	20	15-25
	Cassipourea malosana	2	15	15-15
	Ehretia cymosa	1	20	-
15	*Fagaropsis angolensis*	3	51	23-69
	Euphorbia candelabrum	1	50	-
	Polyscias kikuyuensis	3	40	25-51
	Teclea simplifolia	4	20	10-51
	Celtis africana	1	23	-
	Vangueria infausta	2	14	13-15
	Ehretia cymosa	1	10	-
	Olea europaea	16	26	15-51
	Juniperus procera	3	53	30-84
	Nuxia congesta	12	19	15-30
16	*Olea europaea*	46	21	10-41
	Nuxia congesta	62	18	10-28
	Olinia rochetiana	3	10	10-10
	Cussonia spicata	22	24	13-61
	Celtis africana	2	11	10-13
	Juniperus procera	18	27	13-66
17	*Podocarpus latifolius*	38	59	43-89
	Cassipourea malosana	5	33	28-41
18	*Nuxia congesta*	2	61	33-56
	Podocarpus latifolius	5	53	15-81
	Cassipourea malosana	1	36	-

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
19	*Podocarpus latifolius*	32	51	28-89
	Cassipourea malosana	17	34	23-53
	Apodytes dimidiata	2	56	48-64
	Nuxia congesta	3	83	66-94
	Ekebergia capensis	1	28	-
20	*Nuxia congesta*	10	71	33-127
	Podocarpus latifolius	6	73	64-84
21	*Nuxia congesta*	13	41	23-122
	Podocarpus latifolius	3	72	30-127
	Juniperus procera	5	62	46-84
	Afrocrania volkensii	4	34	25-46
22	*Nuxia congesta*	19	63	36-142
	Buddleia polystachya	1	23	-
	Podocarpus latifolius	4	85	58-114
23	*Juniperus procera*	17	42	25-97
	Olea europaea	5	29	15-74
24	*Nuxia congesta*	2	70	56-84
	Podocarpus latifolius	2	95	89-102
25	*Nuxia congesta*	4	52	35-75
26	*Juniperus procera*	21	27	15-48
27	*Juniperus procera*	9	35	23-56
	Olea europaea	3	25	13-38
	Nuxia congesta	1	20	-
28	*Olea europaea*	13	36	15-86
	Nuxia congesta	23	47	15-102
	Olea capensis	1	23	-
29	*Podocarpus latifolius*	10	96	61-102
	Nuxia congesta	2	75	43-107

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
30	*Olea europaea*	32	22	11-49
	Juniperus procera	12	32	18-45
	Toddalia asiatica	1	18	-
	Trimeria grandifolia	5	17	12-23
	Olinia rochetiana	9	15	11-20
	Trimeria sp.	1	18	-
	Euclea divinorum	11	16	11-24
	Elaeodendron buchananii	2	16	16-17
31	*Juniperus procera*	12	38	20-77
	Olea europaea	18	22	11-73
	Elaeodendron buchananii	5	18	13-22
	Euclea divinorum	3	17	14-20
	Trimeria grandifolia	3	14	11-17
	Olea capensis	2	36	31-41
32	*Olea europaea*	12	26	11-82
	Juniperus procera	9	43	11-80
	Elaeodendron buchananii	3	17	14-18
	Rhus natalensis	2	39	38-39
	Teclea nobilis	3	16	13-20
	Trimeria grandifolia	4	14	12-16
	Maytenus heterophylla	2	15	15-16
33	*Maytenus heterophylla*	2	16	15-17
	Euclea divinorum	15	13	11-20
	Olea europaea	26	23	10-45
	Dodonaea viscosa	1	17	-
	Trimeria grandifolia	11	13	11-19
	Juniperus procera	3	20	13-31
34	*Teclea simplifolia*	10	13	10-15
	Olea europaea	3	34	21-41
	Trimeria grandifolia	2	15	12-17

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
35	*Nuxia congesta*	7	37	21-83
	Olinia rochetiana	7	30	16-57
	Juniperus procera	6	55	18-101
	Olea europaea	4	58	40-67
	Olea capensis	1	37	-
36	*Olinia rochetiana*	4	26	20-42
	Olea europaea	21	43	16-66
	Olea capensis	10	32	22-48
	Nuxia congesta	13	51	20-98
	Juniperus procera	3	67	54-84
37	*Nuxia congesta*	13	24	11-53
	Olea europaea	6	16	11-15
	Juniperus procera	16	38	17-72
	Podocarpus latifolius	28	22	12-33
38	*Olea europaea*	19	24	11-79
	Juniperus procera	18	67	26-155
	Olinia rochetiana	7	20	12-29
	Podocarpus latifolius	33	19	11-37
	Nuxia congesta	16	27	11-61
	Olea capensis	1	20	-
39	*Olea europaea*	6	53	22-103
	Nuxia congesta	24	47	14-128
	Olinia rochetiana	5	38	20-60
	Podocarpus latifolius	2	43	39-51
	Olea capensis	1	114	-
	Ekebergia capensis	2	52	50-54
40	*Olea europaea*	12	42	29-94
	Nuxia congesta	20	43	16-124
	Olea capensis	1	99	-
	Podocarpus latifolius	1	73	-

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
41	*Nuxia congesta*	9	33	16-46
	Oncoba spinosa	1	15	-
	Olinia rochetiana	4	29	13-44
	Olea capensis	8	23	16-44
	Podocarpus falcatus	2	64	30-99
	Elaeodendron buchananii	5	15	12-20
	Juniperus procera	4	63	32-144
	Olea europaea	1	16	-
	Rapanea melanophloeos	1	21	-
42	*Olea capensis*	18	22	11-47
	Olea europaea	12	25	13-55
	Elaeodendron buchananii	9	17	11-29
	Juniperus procera	8	45	19-94
	Nuxia congesta	5	37	20-53
	Olinia rochetiana	3	34	17-64
43	*Juniperus procera*	1	95	-
	Dombeya torrida	3	48	33-72
	Nuxia congesta	4	38	12-68
	Podocarpus falcatus	1	32	-
	Teclea nobilis	1	23	-
	Olea capensis	1	66	-
44	*Nuxia congesta*	18	41	13-127
	Olea europaea	6	57	22-87
	Podocarpus latifolius	12	42	13-97
	Olinia rochetiana	2	45	29-61
	Juniperus procera	4	69	54-78
	Rapanea melanophloeos	2	11	10-13
	Schefflera volkensii	1	120	-
	Hypericum revolutum	2	17	16-18

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
45	*Podocarpus latifolius*	14	36	14-59
	Olinia rochetiana	2	42	40-43
	Olea europaea	12	47	11-55
	Juniperus procera	5	50	34-87
	Rapanea melanophloeos	1	19	-
	Elaeodendron buchananii	2	18	11-24
	Nuxia congesta	17	45	14-106
	Hypericum revolutum	2	42	25-60
46	*Juniperus procera*	38	31	12-58
	Olea europaea	48	19	11-41
	Hagenia abyssinica	1	48	-
	Nuxia congesta	14	23	14-33
	Faurea saligna	1	16	-
47	*Xymalos monospora*	1	48	-
	Psychotria mahonii	3	41	29-51
	Macaranga kilimandscharica	3	33	17-44
	Ekebergia capensis	1	19	-
	Tabernaemontana pachysiphon	2	19	15-23
	Albizia gummifera	1	93	-
48	*Neoboutonia macrocalyx*	11	27	11-57
	Tabernaemontana pachysiphon	11	25	19-41
	Xymalos monospora	3	30	21-43
	Macaranga kilimandscharica	5	56	49-66
	Schefflera volkensii	4	72	56-95
	Podocarpus latifolius	1	30	-
	Ochna ovata	2	41	25-57
	Syzygium guineense	4	31	14-55
	Galiniera saxifraga	1	25	-
	Psychotria mahonii	3	27	21-25
	Suregada procera	1	12	-

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
49	*Nuxia congesta*	38	42	16-127
	Podocarpus latifolius	15	51	29-76
	Lepidotrichilia emetica	6	24	14-29
	Schefflera volkensii	1	102	-
	Cassipourea malosana	2	29	28-30
50	*Neoboutonia macrocalyx*	22	22	10-45
	Podocarpus latifolius	3	40	36-47
	Ekebergia capensis	1	45	-
	Cassipourea malosana	5	34	20-46
	Apodytes dimidiata	1	14	-
	Galiniera saxifraga	3	17	15-20
	Ochna ovata	1	44	-
	Tabernaemontana pachysiphon	3	30	14-39
51	*Podocarpus latifolius*	9	32	20-44
	Apodytes dimidiata	1	29	-
	Tabernaemontana pachysiphon	3	26	24-29
	Nuxia congesta	24	32	12-70
	Neoboutonia macrocalyx	1	11	-
	Galiniera saxifraga	3	17	15-20
	Lepidotrichilia volkensii	1	15	-
	Cassipourea malosana	2	43	32-53
52	*Neoboutonia macrocalyx*	12	21	13-38
	Albizia gummifera	2	64	45-83
	Macaranga kilimandscharica	13	35	21-53
	Psychotria mahonii	3	20	12-34
	Tabernaemontana pachysiphon	17	21	11-36
	Nuxia congesta	2	22	11-32
	Ochna ovata	4	19	12-32
	Draceana steudneri	11	18	12-25
	Galiniera saxifraga	11	20	11-38
	Xymalos monospora	9	18	13-34
	Euclea divinorum	6	16	9-141

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
53	*Neoboutonia macrocalyx*	5	26	14-41
	Ochna ovata	5	49	13-84
	Tabernaemontana pachysiphon	4	19	15-25
	Macaranga kilimandscharica	1	28	-
	Podocarpus latifolius	1	31	-
	Schefflera volkensii	1	127	-
	Psychotria mahonii	1	53	-
	Albizia gummifera	1	52	-
	Galiniera saxifraga	1	20	-
	Xymalos monospora	1	11	-
54	*Nuxia congesta*	8	29	10-60
	Xymalos monospora	4	27	21-42
	Psychotria mahonii	3	16	13-18
	Galiniera saxifraga	1	10	-
	Agauria salicifolia	4	55	41-67
	Macaranga kilimandscharica	5	32	24-48
	Rapanea melanophloeos	1	22	-
55	*Nuxia congesta*	15	25	15-48
	Podocarpus latifolius	3	62	42-77
	Neoboutonia macrocalyx	3	17	15-22
	Schefflera volkensii	1	97	-
56	*Neoboutonia macrocalyx*	12	26	13-45
	Nuxia congesta	7	27	15-40
	Macaranga kilimandscharica	21	44	32-71
	Tabernaemontana pachysiphon	6	16	10-24
	Psychotria mahonii	14	21	11-42
	Galiniera saxifraga	16	19	11-32
	Podocarpus latifolius	2	21	20-21

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
57	*Neoboutonia macrocalyx*	13	19	11-27
	Psychotria mahonii	40	19	10-37
	Podocarpus latifolius	9	17	11-31
	Macaranga kilimandscharica	5	53	27-74
	Ekebergia capensis	1	10	-
	Tabernaemontana pachysiphon	5	24	12-45
	Galiniera saxifraga	19	14	10-27
	Dracaena steudneri	7	14	10-21
	Halleria lucida	2	20	18-21
58	*Psychotria mahonii*	6	17	12-21
	Galiniera saxifraga	17	17	10-28
	Neoboutonia macrocalyx	14	21	10-43
	Podocarpus latifolius	2	40	30-43
	Agauria salicifolia	1	93	-
	Tabernaemontana pachysiphon	5	14	11-19
	Macaranga kilimandscharica	8	35	16-45
59	*Ekebergia capensis*	1	94	-
	Lepidotrichilia volkensii	2	23	15-30
	Xymalos monospora	4	15	13-20
	Neoboutonia macrocalyx	33	32	13-71
	Macaranga kilimandscharica	2	38	33-43
	Tabernaemontana pachysiphon	8	22	15-46
	Syzygium guineense	2	34	25-43
	Ochna ovata	2	64	46-81
	Ochna holstii	1	48	-
	Psychotria mahonii	2	28	28-28
	Lasianthus kilimandscharicus	1	15	-

Table 16. (continued)

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
60	*Chrysophyllum gorungosanum*	1	66	-
	Syzygium guineense	3	23	10-46
	Macaranga kilimandscharica	25	25	11-50
	Tabernaemontana pachysiphon	6	14	12-15
	Lasianthus kilimandscharicus	2	16	14-18
	Nuxia congesta	3	88	50-120
	Psychotria mahonii	7	16	11-26
	Strombosia scheffleri	1	16	-
	Peddiea fischeri	2	14	12-16
	Ocotea usambarensis	1	75	-
	Lepidotrichilia volkensii	2	13	12-14
	Neoboutonia macrocalyx	3	27	22-30
	Podorcarpus latifolius	2	12	12-12
	Macaranga capensis	2	21	20-22
	Ochna holstii	5	24	14-35
	Suregada procera	16	17	10-35
61	*Macaranga kilimandscharica*	50	31	10-56
	Psychotria mahonii	9	22	15-30
	Podorcarpus latifolius	5	28	17-53
	Apodytes dimidiata	1	21	-
	Tabernaemontana pachysiphon	3	24	20-30
	Neoboutonia macrocalyx	2	33	20-45
	Lasianthus kilimandscharicus	1	10	-
	Teclea nobilis	1	17	-
	Schefflera volkensii	3	112	91-135
	Chrysophyllum gorungosanum	2	45	40-50
	Cassipourea malosana	1	23	-
	Afrocrania volkensii	1	119	-
62	*Tabernaemontana pachysiphon*	21	19	10-50
	Macaranga kilimandscharica	9	26	10-62
	Anigeria adolfi-friedericii	9	71	18-200
	Apodytes dimidiata	4	20	16-27

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
62	*Ocotea usambarensis*	6	58	50-80
	Neoboutonia macrocalyx	6	19	13-26
	Lepidotrichilia volkensii	2	18	15-20
	Ochna holstii	14	20	12-27
	Psychotria mahonii	16	21	10-45
	Syzygium guineense	4	37	25-55
	Podorcarpus latifolius	16	20	10-37
	Suregada procera	18	23	12-60
	Ochna ovata	1	15	-
63	*Neoboutonia macrocalyx*	58	17	10-30
	Lepidotrichilia volkensii	10	12	10-15
	Galiniera saxifraga	2	13	10-15
	Schefflera volkensii	4	80	60-100
	Podorcarpus latifolius	4	34	13-70
	Olea capensis	6	22	10-70
	Clausena anisata	2	10	10-10
	Xymalos monospora	4	18	12-30
	Cassipourea malosana	9	24	10-53
	Nuxia congesta	7	21	12-34
64	*Erica arborea*	19	21	10-33
	Canthium oligocarpum	14	14	11-26
	Rapanea melanopholoeos	1	15	-
	Hypericum revolutum	1	18	-
	Juniperus procera	38	39	19-89
	Rhamnus prinoides	1	10	-
	Acacia melanoxylon	1	36	-
	Podorcarpus latifolius	33	15	10-17
	Olea europaea	4	17	11-29
	Nuxia congesta	33	19	12-38
	Schefflera volkensii	11	25	13-38
65	*Drypetes gerrardii*	1	42	-
	Canthium oligocarpum	17	15	10-28

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
65	*Hypericum revolutum*	4	15	11-18
	Allophylus abyssinicus	2	23	16-30
	Podorcarpus latifolius	50	20	13-42
	Buddleia polystachya	1	27	-
	Juniperus procera	21	50	13-90
	Nuxia congesta	38	20	10-48
	Dombeya torrida	3	16	14-22
66	*Olea europaea*	1	33	-
	Pygeum africanum	2	35	29-40
	Juniperus procera	24	42	25-80
	Hagenia abyssinica	21	32	10-80
	Buddleia polystachya	3	16	14-20
	Acacia melanoxylon	4	23	15-50
67	*Juniperus procera*	27	40	11-96
	Pinus patula	2	16	10-21
	Agauria salicifolia	2	18	15-20
	Ilex mitis	1	28	-
	Podorcarpus latifolius	2	21	16-26
68	*Pinus patula*	1	14	-
	Juniperus procera	6	47	25-70
	Erica arborea	5	14	11-16
	Canthium oligocarpum	2	14	12-15
69	*Xymalos monospora*	10	14	10-18
	Nuxia congesta	1	30	-
	Macaranga kilimandscharica	14	28	14-50
	Peddiea fischeri	1	15	-
	Apodytes dimidiata	2	15	13-17
	Neoboutonia macrocalyx	22	20	10-32
	Galiniera saxifraga	1	10	-
	Ochna holstii	1	26	-
	Casaeria battiscombei	1	10	-

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
69	*Syzygium guineense*	1	28	-
	Psychotria mahonii	4	18	14-23
70	*Olea capensis hochstetteri*	1	30	-
	Olea europaea	11	33	23-56
	Juniperus procera	19	69	30-104
	Nuxia congesta	26	25	10-53
	Elaeodendron buchananii	1	15	-
	Dombeya torrida	1	10	-
	Olinia rochetiana	1	10	-
71	*Dombeya torrida*	5	13	10-15
	Juniperus procera	63	41	15-61
	Olea europaea	36	23	10-43
	Olinia rochetiana	1	10	-
	Nuxia congesta	18	25	10-46
72	*Dombeya torrida*	19	25	13-41
	Nuxia congesta	9	36	10-66
	Rhamnus prinoides	2	13	10-15
	Juniperus procera	32	35	10-69
	Olinia rochetiana	2	53	23-84
	Hypericum revolutum	3	28	20-36
	Erica arborea	1	15	-
	Ekebergia capensis	1	61	-
73	*Nuxia congesta*	14	41	10-132
	Juniperus procera	21	58	28-89
	Olea europaea	13	20	10-30
	Elaeodendron buchananii	3	10	10-13
74	*Olea europaea*	28	23	15-48
	Juniperus procera	57	43	10-76
	Nuxia congesta	6	30	10-84

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
75	*Elaeodendron buchananii*	70	15	10-30
	Olea europaea	41	15	10-20
	Olinia rochetiana	36	15	10-41
	Juniperus procera	48	38	10-64
	Faurea saligna	1	18	-
	Nuxia congesta	7	25	13-33
76	*Elaeodendron buchananii*	55	15	10-30
	Rhamnus prinoides	2	10	10-10
	Juniperus procera	34	41	10-99
	Olinia rochetiana	25	18	10-28
	Olea europaea	39	18	10-24
	Nuxia congesta	12	24	10-36
77	*Dombeya torrida*	23	36	10-58
	Nuxia congesta	49	28	10-102
	Olea europaea	19	41	15-71
	Elaeodendron buchananii	1	13	-
	Juniperus procera	1	140	-
78	*Acacia melanoxylon*	2	15	10-19
	Nuxia congesta	24	48	27-70
	Dombeya torrida	1	18	-
79	*Stoebe kilimandscharica*	1	28	-
80	*Hypericum revolutum*	2	10	10-10
	Stoebe kilimandscharica	1	10	-
81	*Hypericum revolutum*	2	12	10-14
	Stoebe kilimandscharica	1	10	-
82	*Hagenia abyssinica*	1	18	-

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
83	*Hagenia abyssinica*	7	58	40-70
	Stoebe kilimandscharica	9	14	10-20
	Hypericum revolutum	4	12	10-14
84	*Hagenia abyssinica*	4	21	12-40
	Hypericum revolutum	1	10	-
	Stoebe kilimandscharica	6	24	10-58
85	*Hagenia abyssinica*	4	12	11-13
	Hypericum revolutum	10	14	10-41
	Nuxia congesta	6	80	50-104
	Dombeya torrida	1	36	-
	Juniperus procera	1	17	-
86	*Hagenia abyssinica*	9	20	11-50
	Juniperus procera	4	27	20-35
	Hypericum revolutum	7	14	10-21
	Nuxia congesta	2	15	13-16
87	*Dombeya torrida*	11	17	10-24
	Hypericum revolutum	21	11	10-15
	Hagenia abyssinica	22	16	10-34
	Juniperus procera	13	21	10-34
	Nuxia congesta	13	16	13-21
88	*Nuxia congesta*	1	105	-
89	*Nuxia congesta*	4	47	10-94
	Vernonia sp.	1	11	-
	Hypericum revolutum	3	11	10-12
	Dombeya torrida	1	34	-
90	*Senna didymobotrya*	1	19	-
	Nuxia congesta	1	10	-
	Dombeya torrida	9	44	22-107

Table 16. (continued).

Transect	Tree species	Sample size	Mean dbh (cm)	Range dbh (cm)
90	*Hypericum revolutum*	1	13	-
	Hagenia abyssinica	1	55	-
91	*Dombeya torrida*	6	15	10-35
	Buddleia polystachya	3	11	11-12
	Olea europaea	1	10	-
	Nuxia congesta	1	25	-
	Elaeodendron buchananii	1	14	-
	Juniperus procera	1	64	-
92	*Juniperus procera*	9	49	36-67
	Olinia rochetiana	1	11	-
	Maytenus heterophylla	6	14	11-17
93	*Nuxia congesta*	15	25	10-102
	Olea capensis	1	11	-
	Olinia rochetiana	21	18	10-28
	Buddleia polystachya	2	20	11-29
	Juniperus procera	2	23	16-30
	Cussonia spicata	1	20	-
	Maytenus heterophylla	5	12	10-17
	Warburgia ugandensis	1	11	-
	Dombeya torrida	2	13	10-15
	Rhamnus priniodes	1	10	-
	Elaeodendron buchananii	5	17	12-21
	Unidentified sp.	1	10	-

ABERDARES FENCE PROJECT RESEARCH: TREE BELT TRANSECTS

Observers:_____
Date:_____

Phase:_____ Section:_____ Transect no.:_____ Altitude (ft):_____

Habitat type:

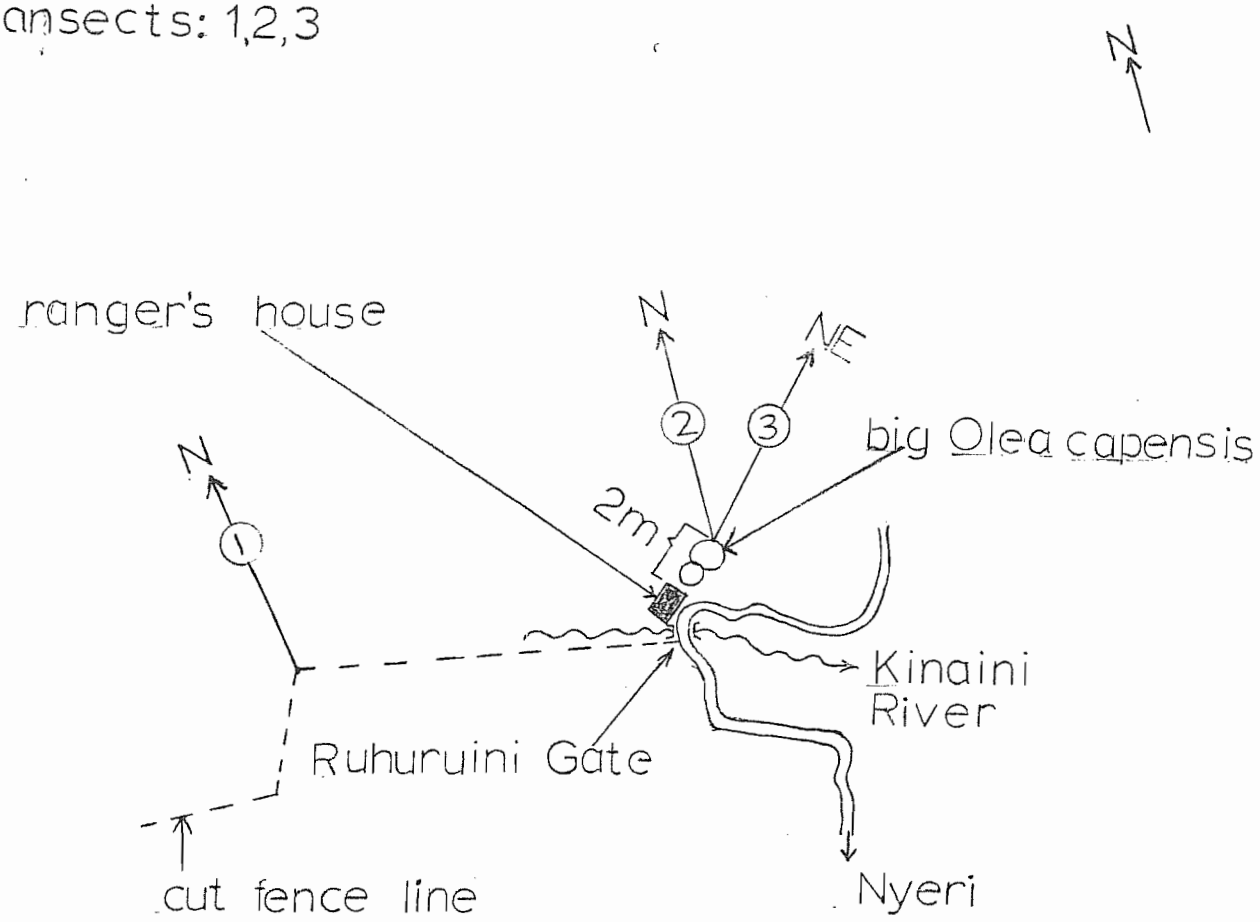
Map:

Species	DBH (cm)	N	Mean

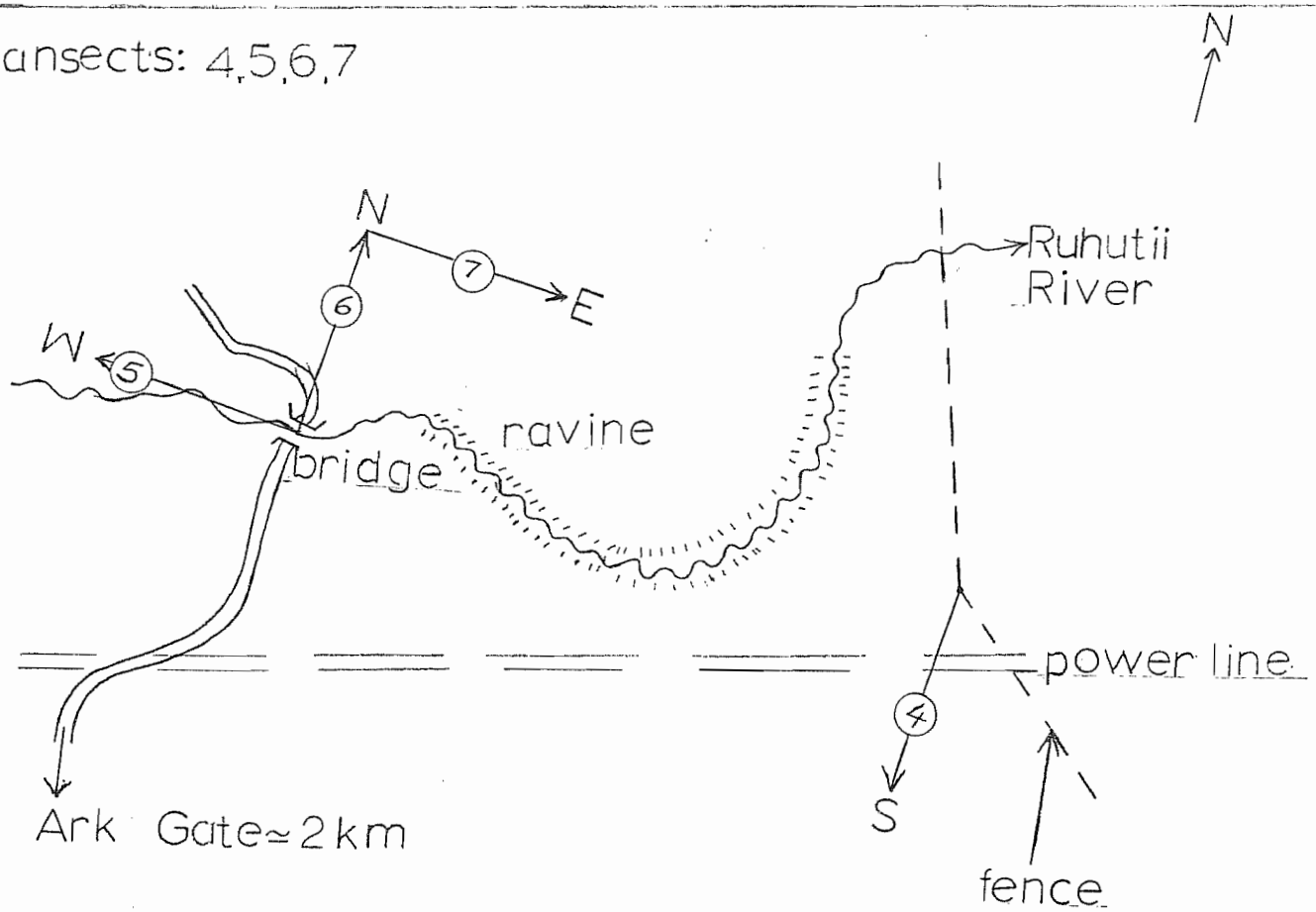
LOCATIONS WHERE 93 TREE BELT-TRANSECTS WERE PLACED DURING THE ABERDARES WILDLIFE FENCE STUDY, KENYA (1997-98)

(See Table 9 and Map 18)

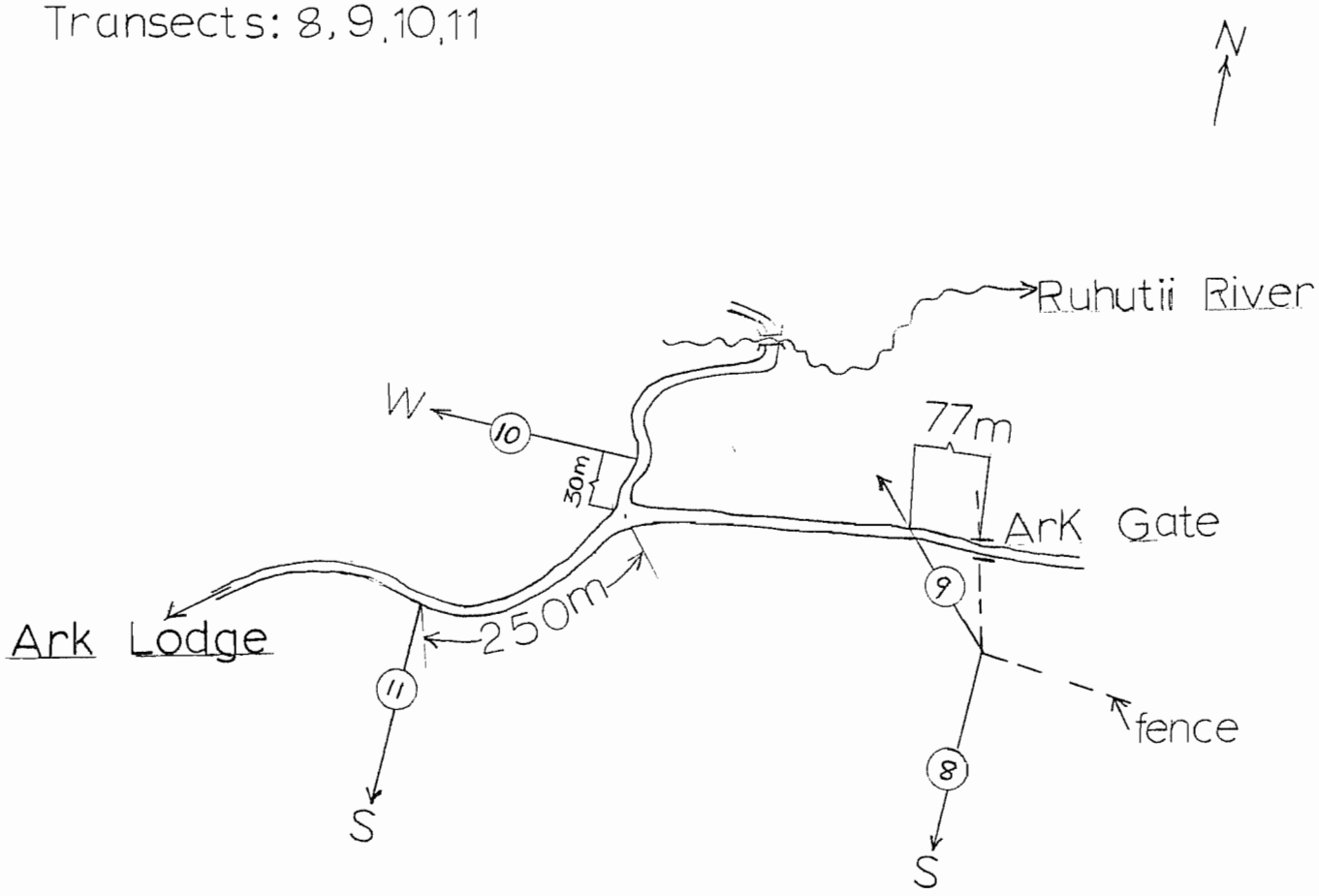
Transects: 1,2,3



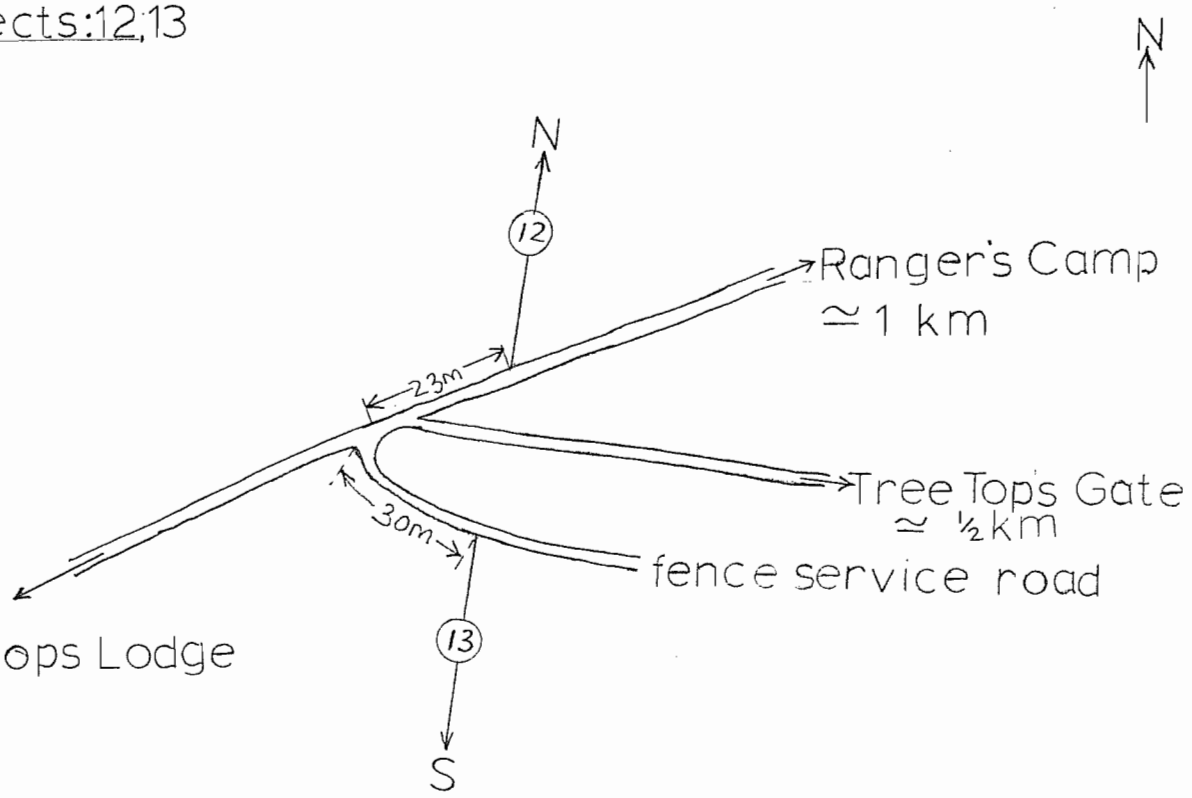
Transects: 4,5,6,7



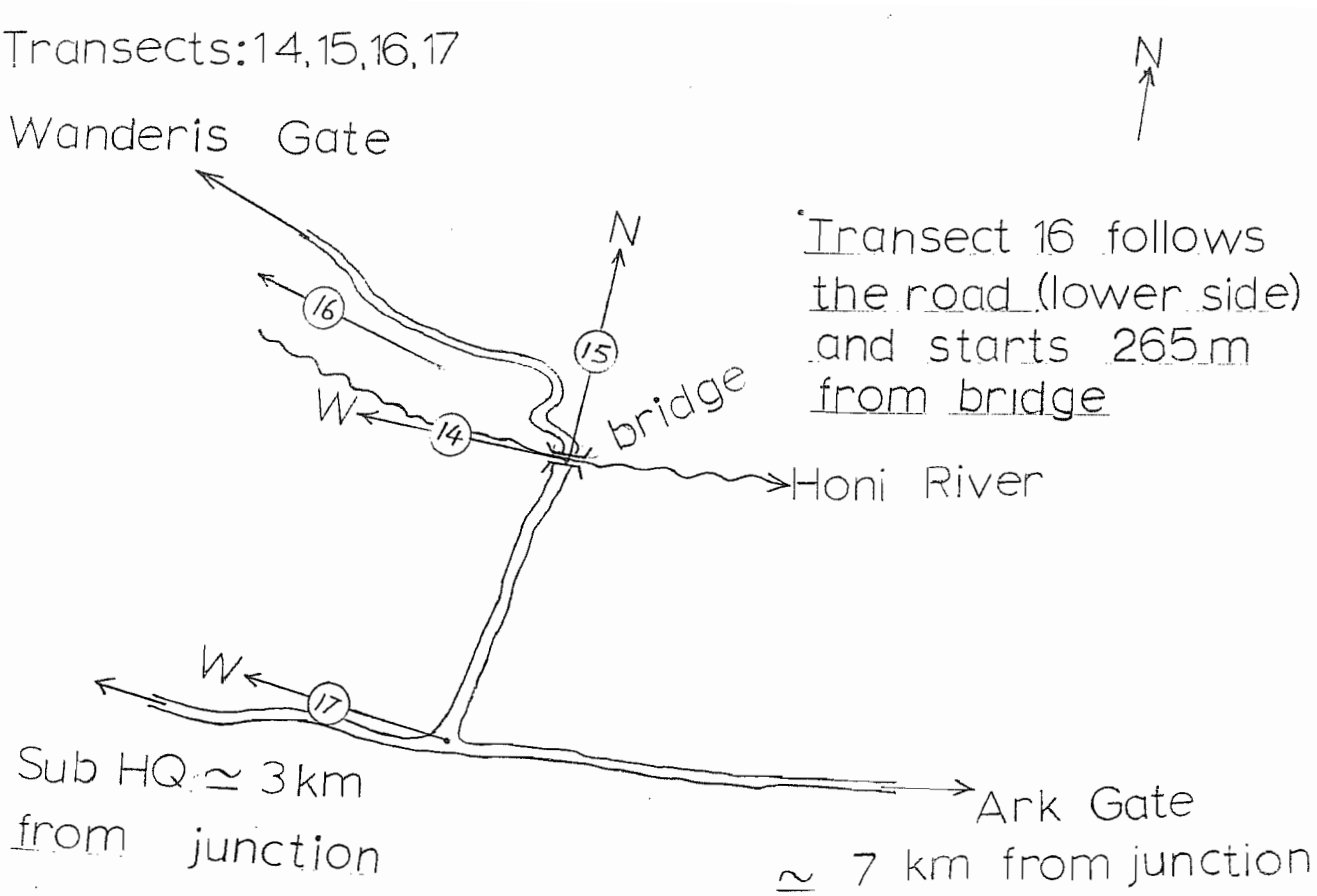
Transects: 8, 9, 10, 11



Transects: 12, 13

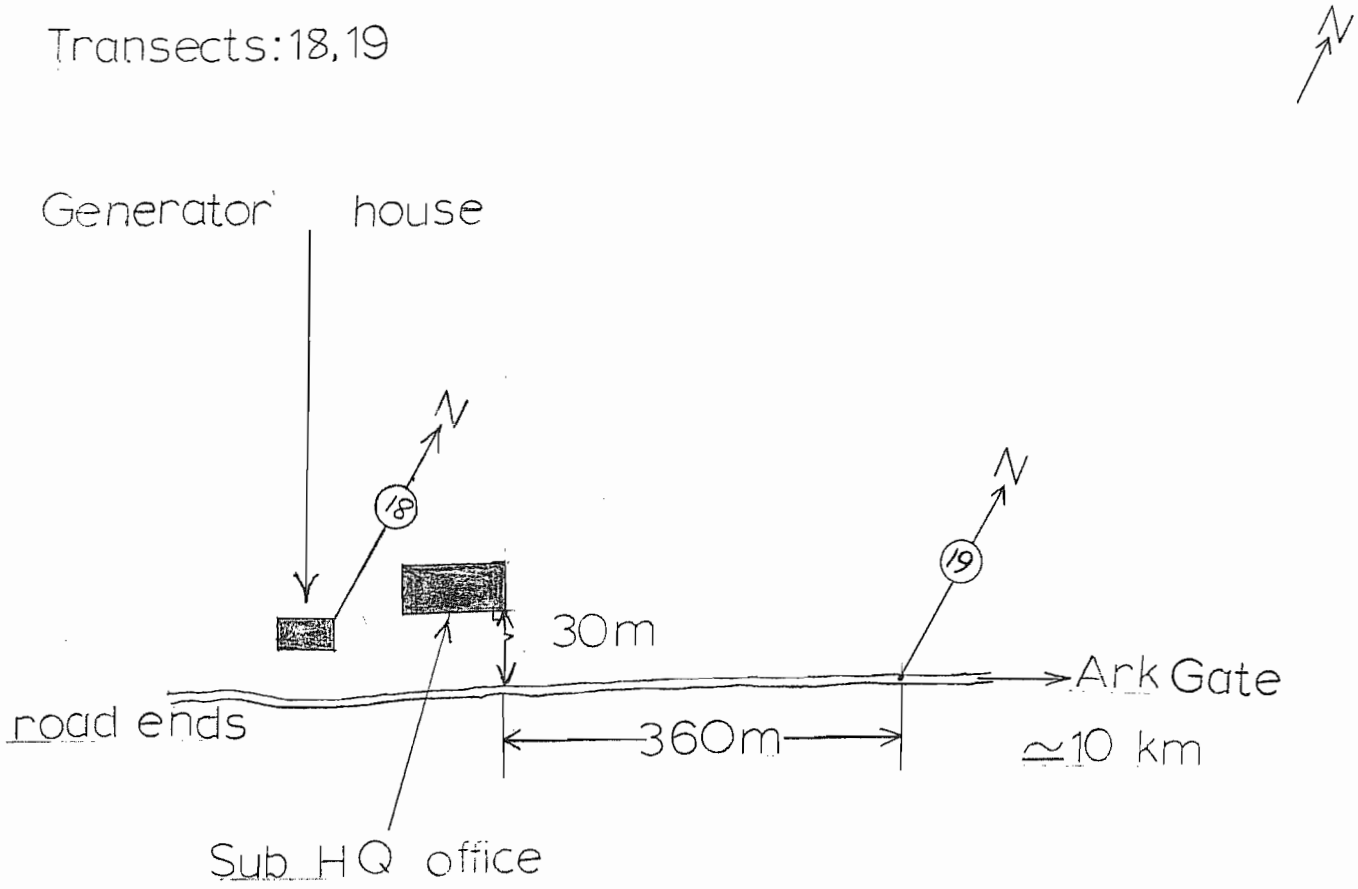


Transects: 14, 15, 16, 17



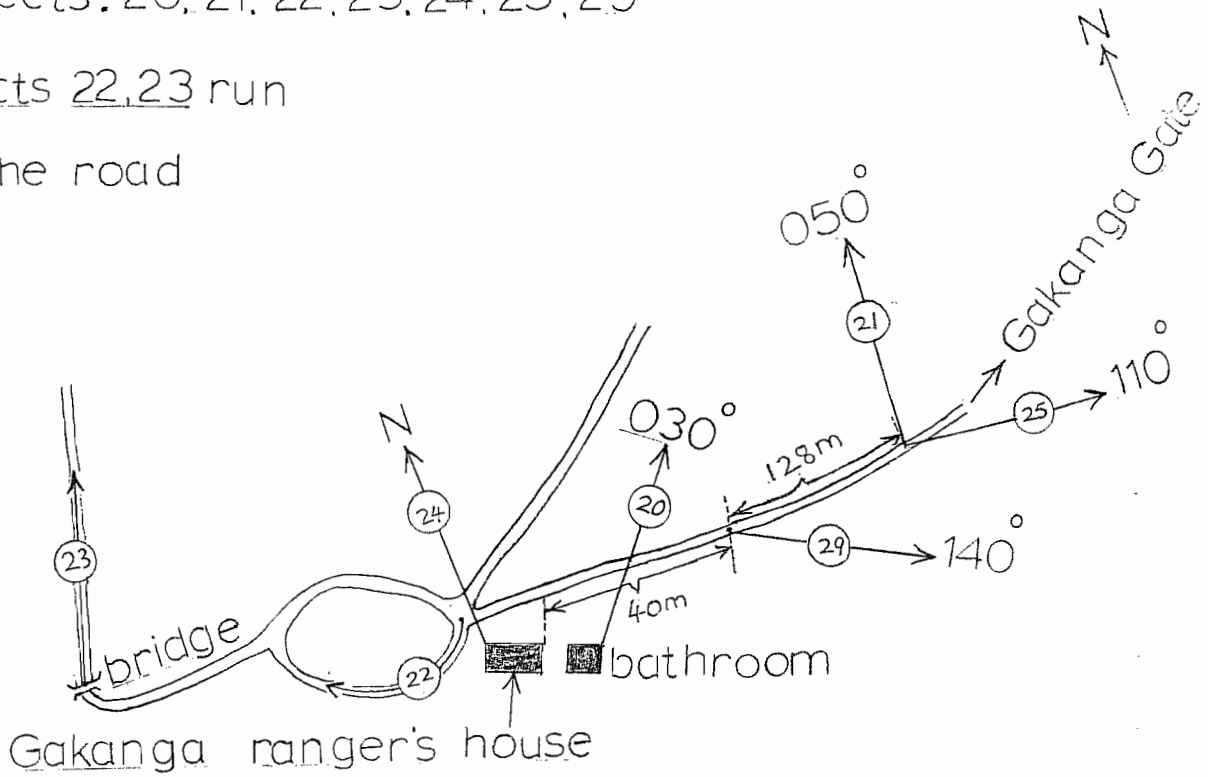
Transect 16 follows the road (lower side) and starts 265 m from bridge

Transects: 18, 19

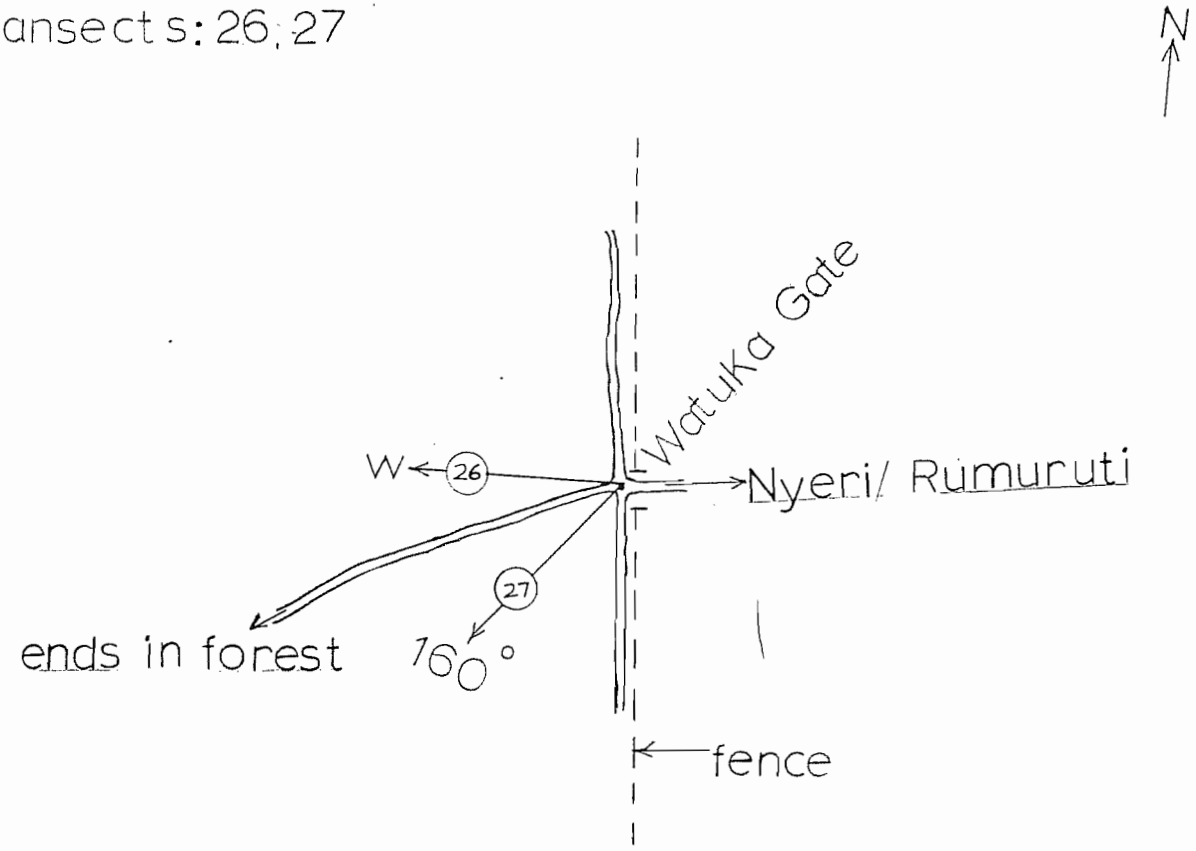


Transects: 20, 21, 22, 23, 24, 25, 29

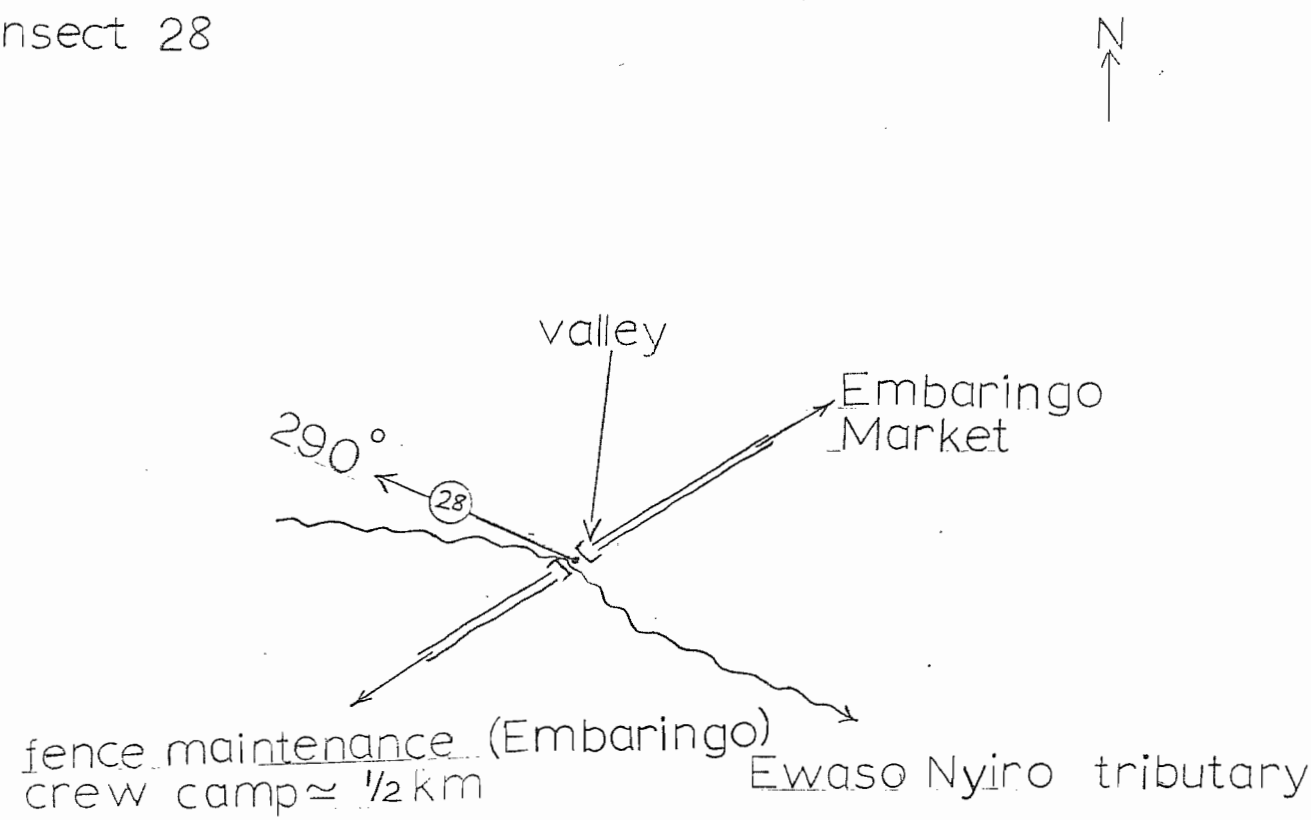
•Transects 22,23 run along the road



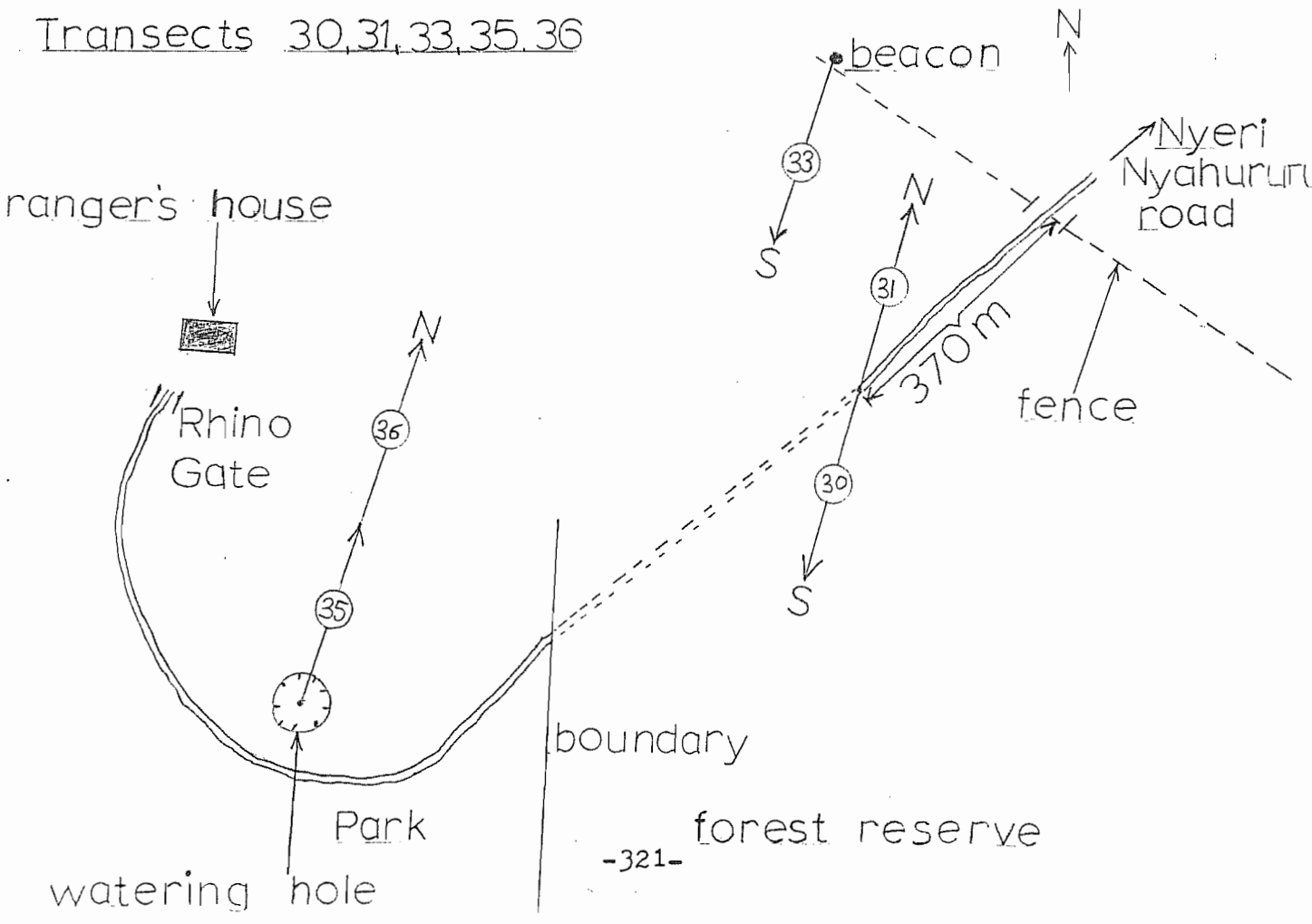
Transects: 26, 27



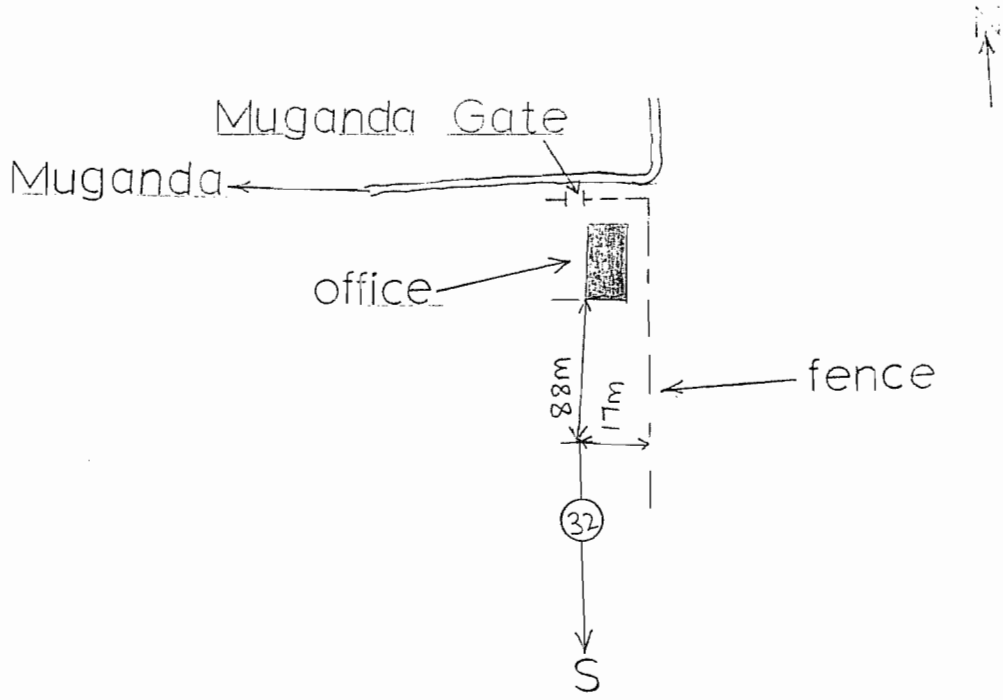
Transect 28



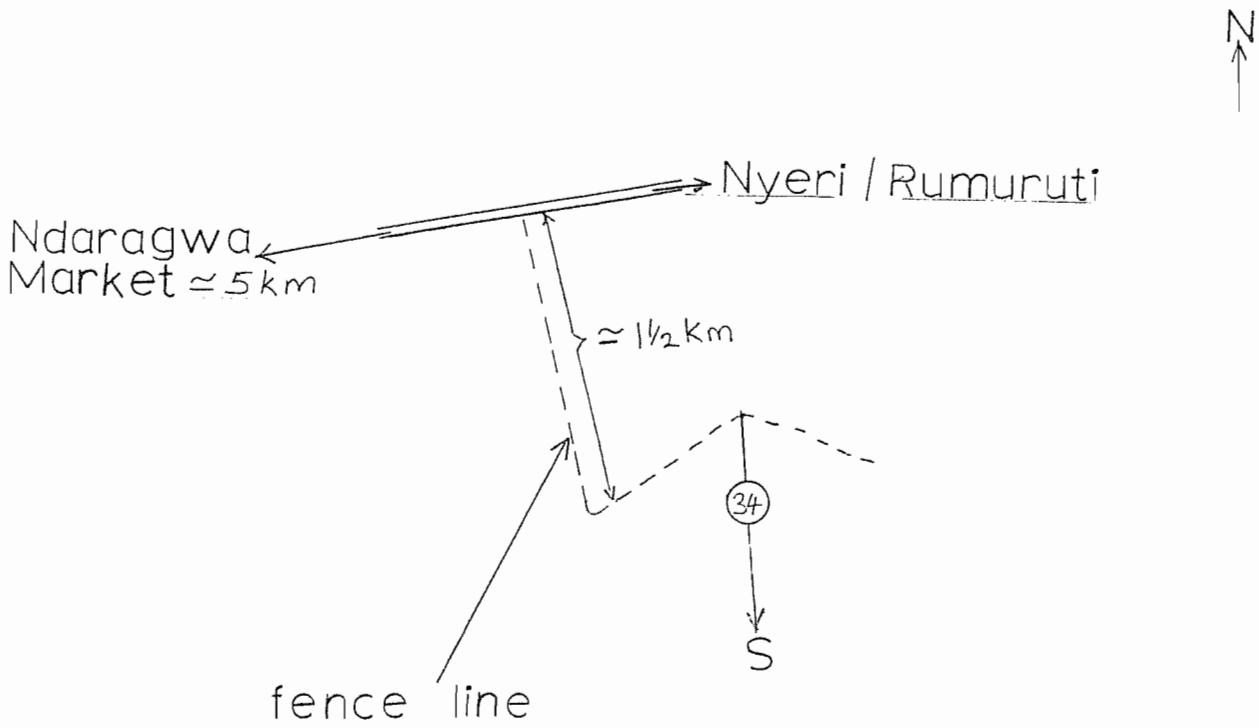
Transects 30, 31, 33, 35, 36



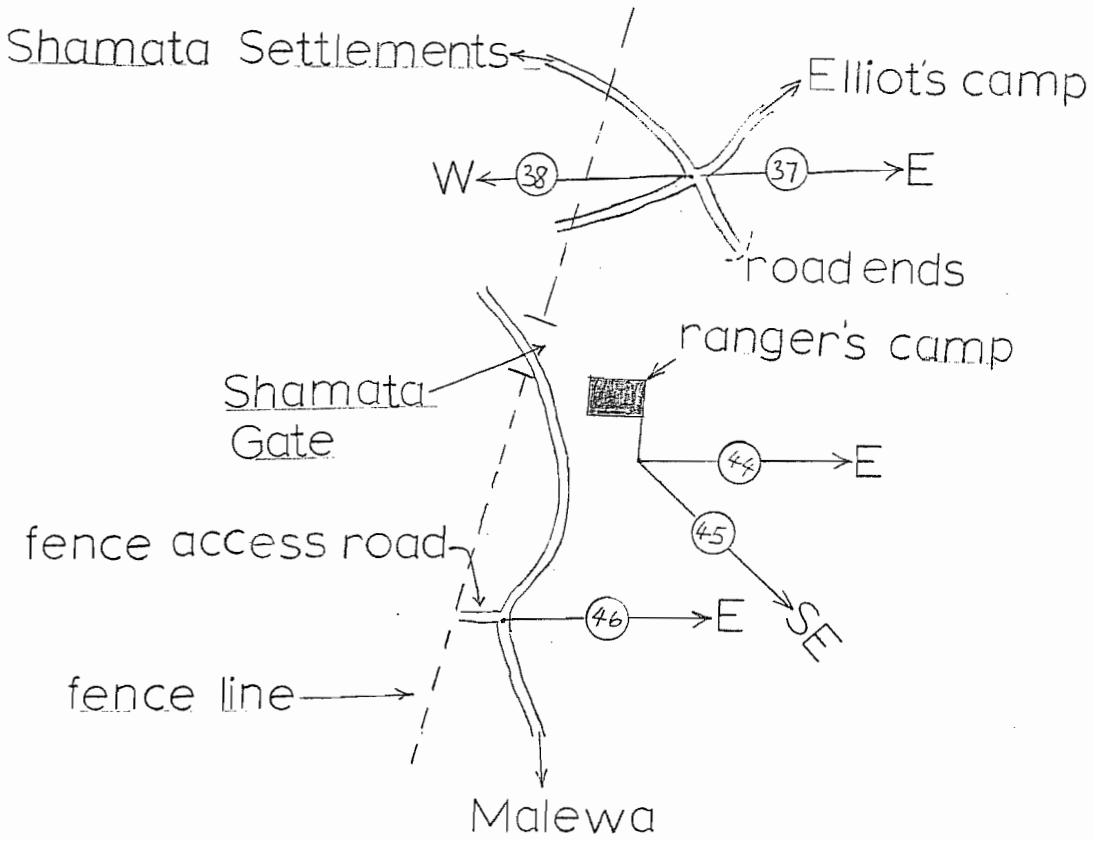
Transect 32



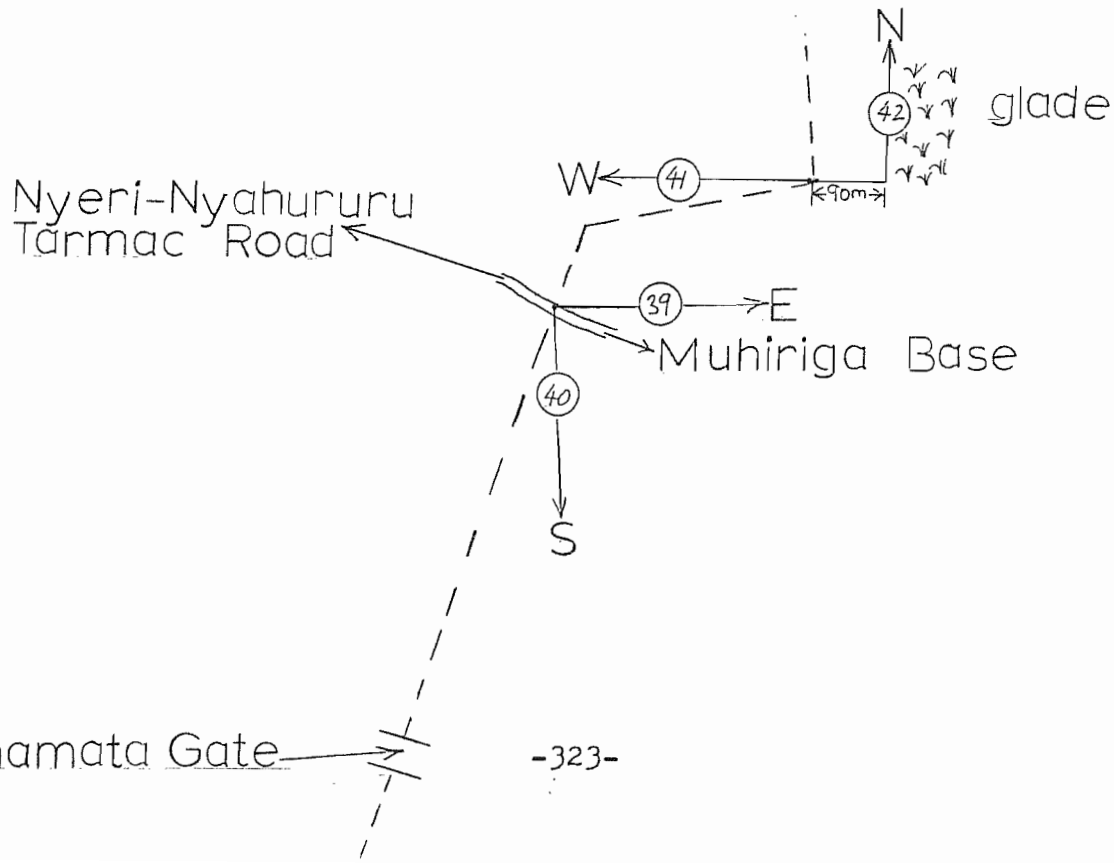
Transect 34



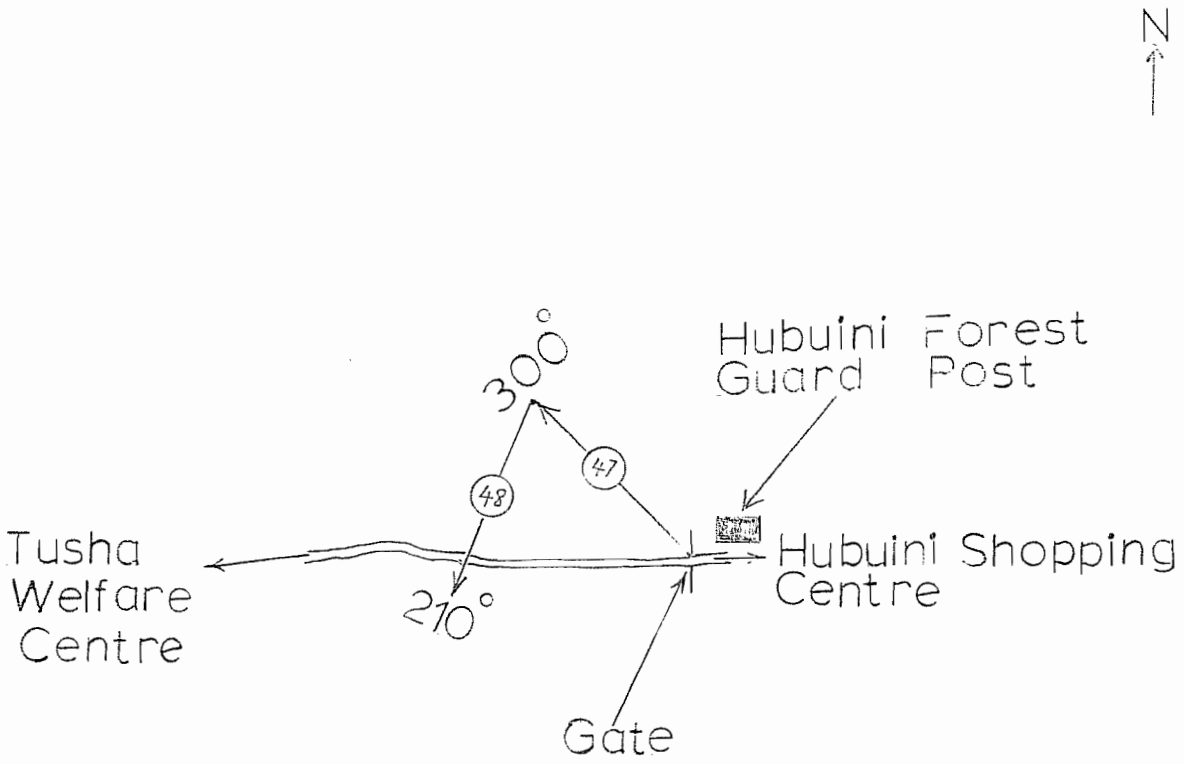
Transect 37, 38, 44, 45, 46



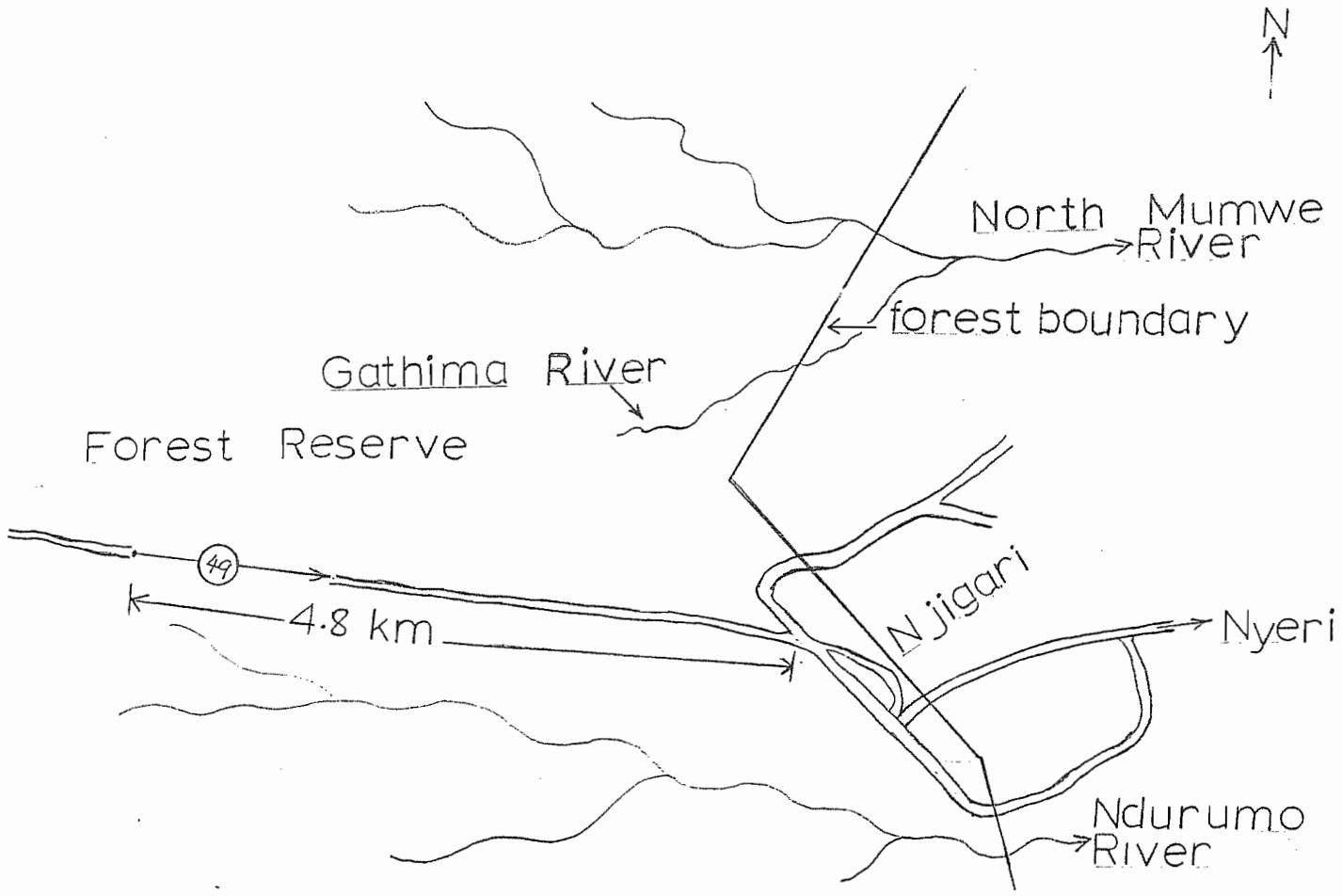
Transect 39, 40, 41, 42, 43



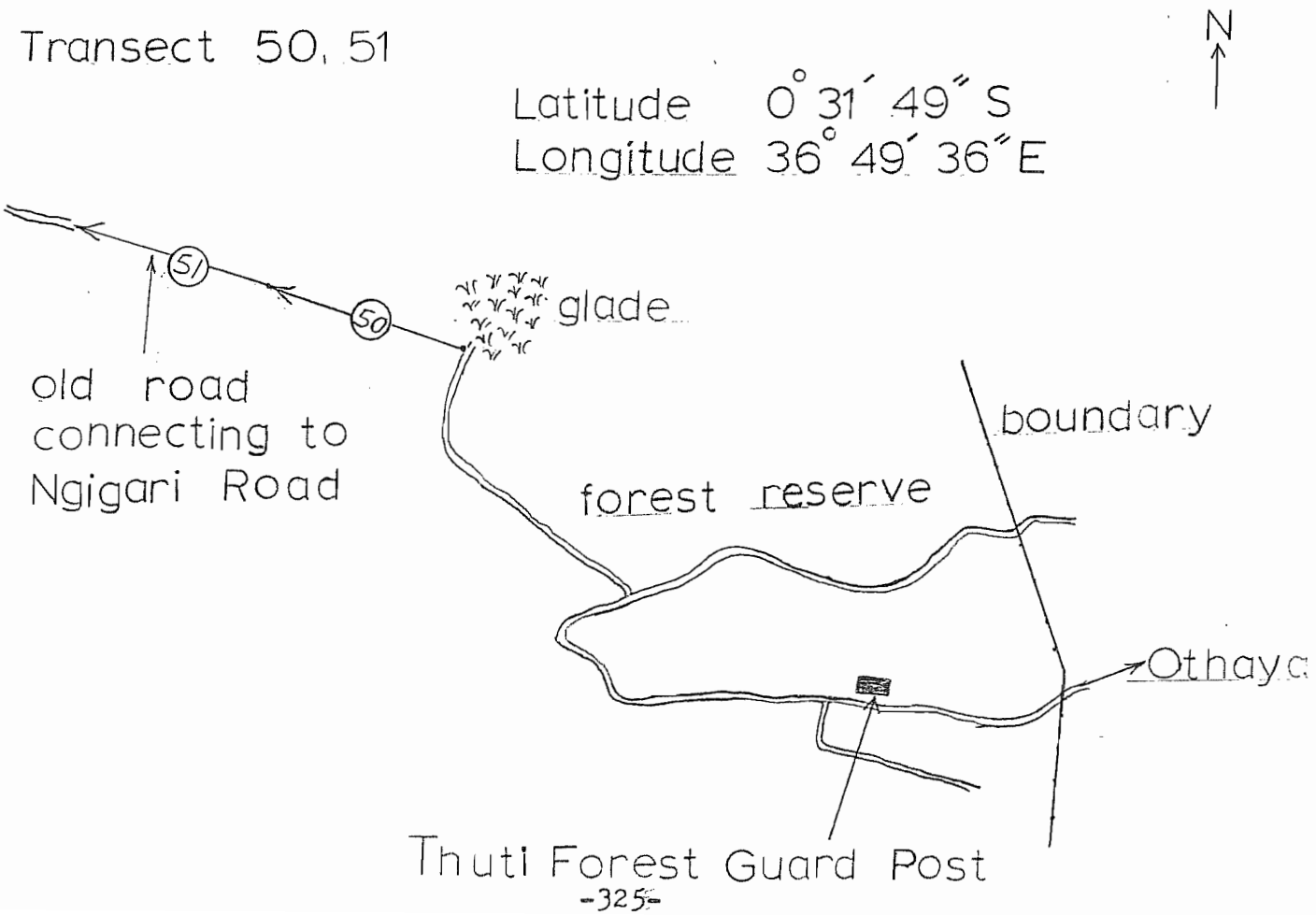
Transects 47, 48



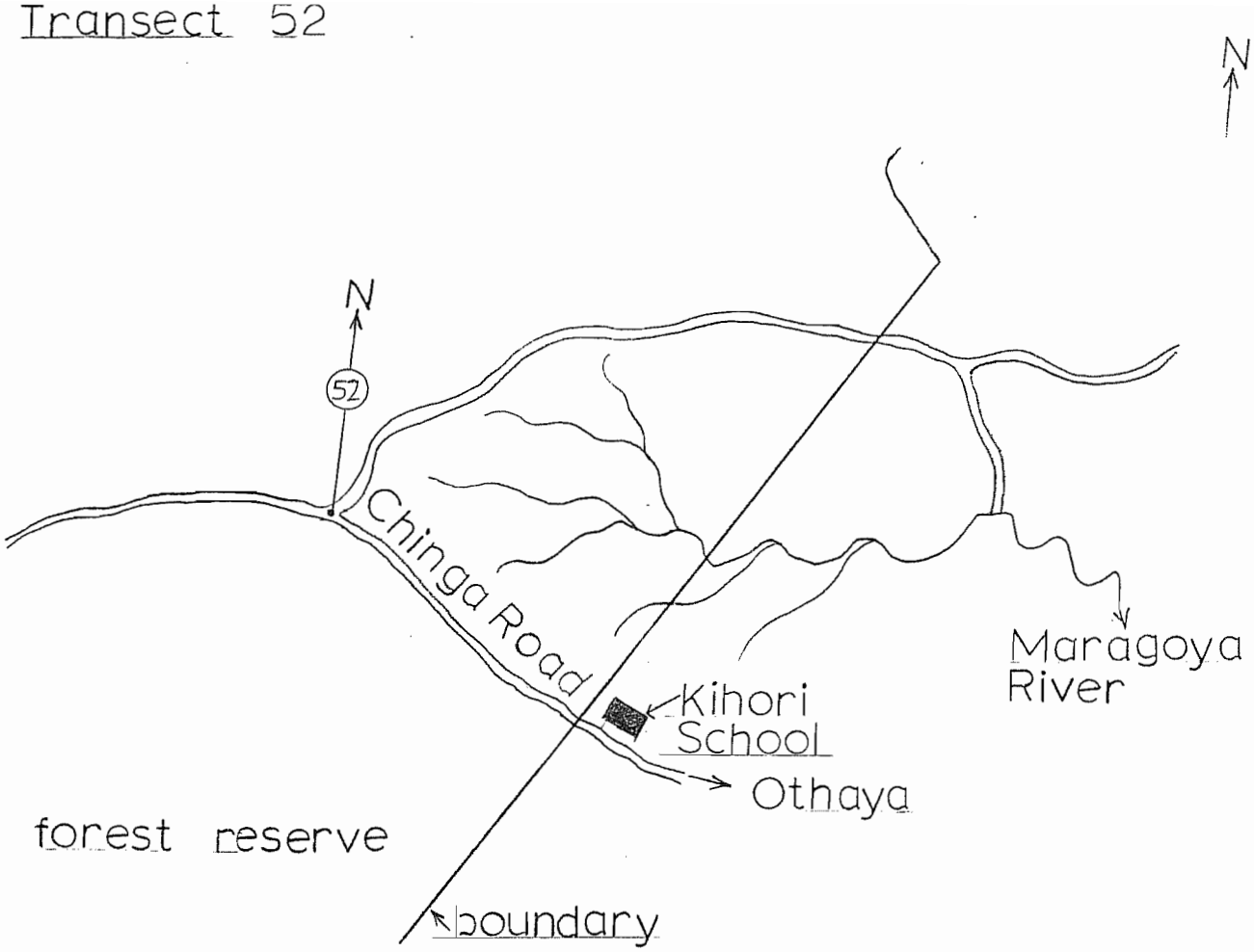
Transect 49



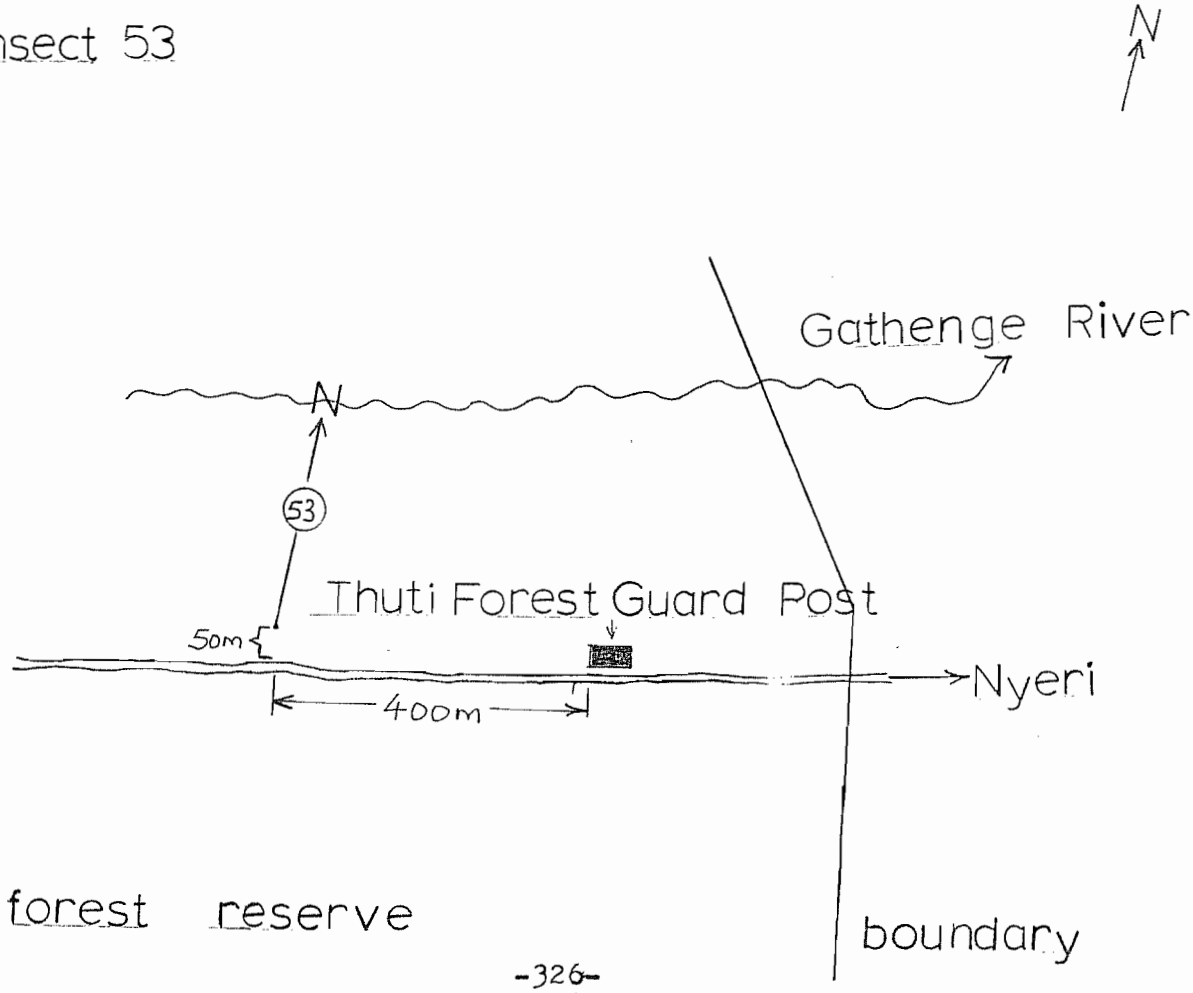
Transect 50, 51



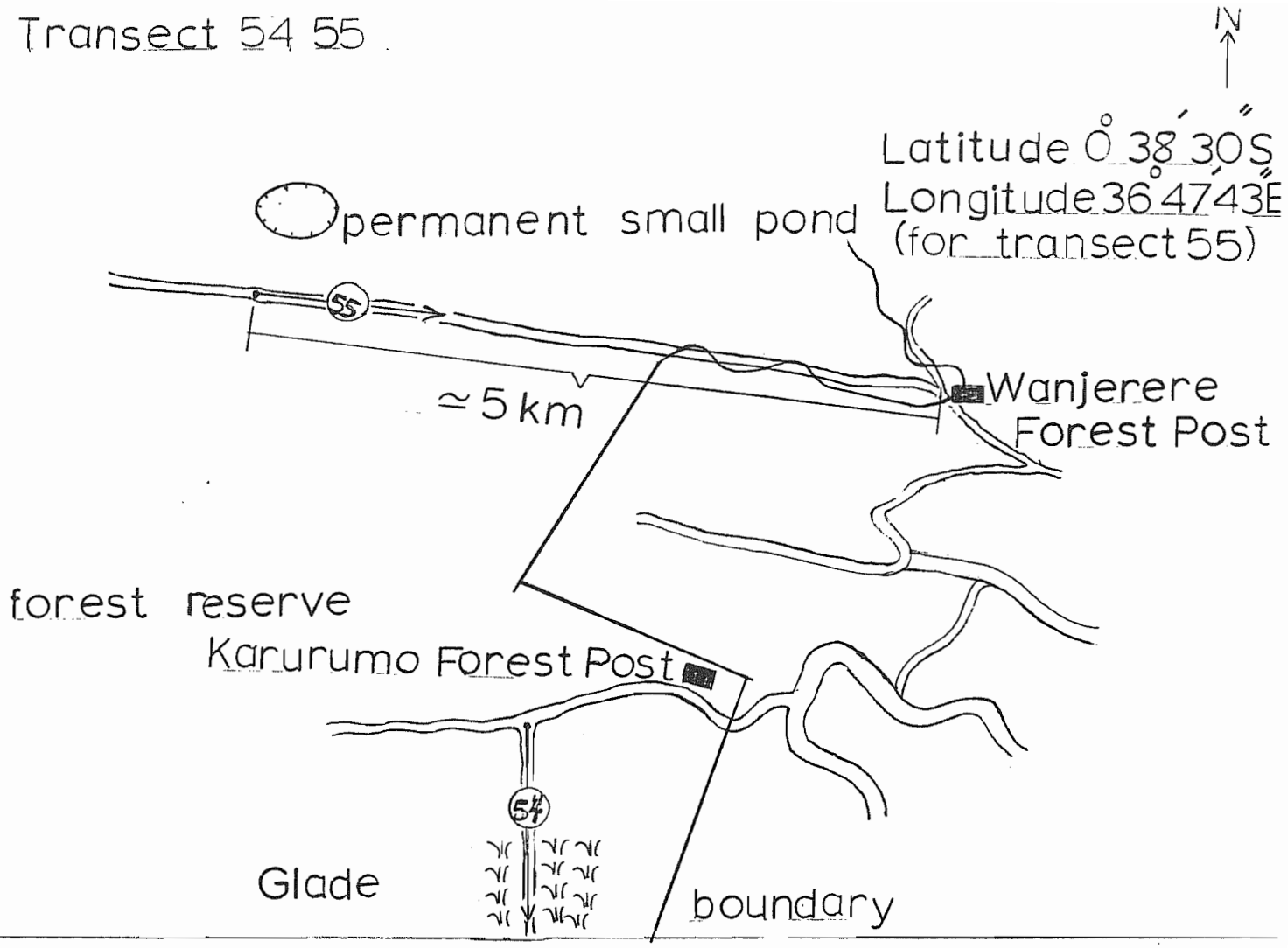
Transect 52



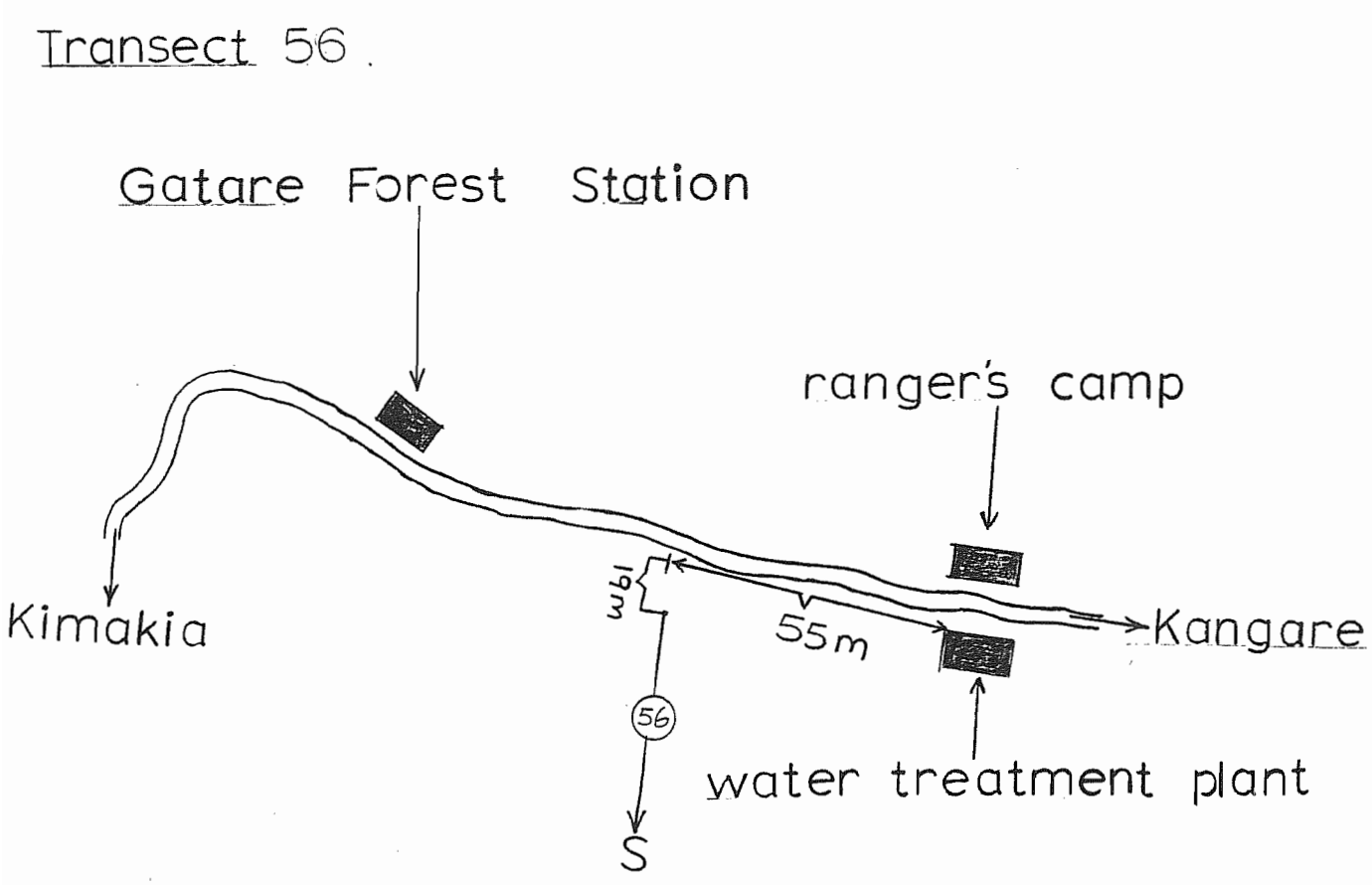
Transect 53



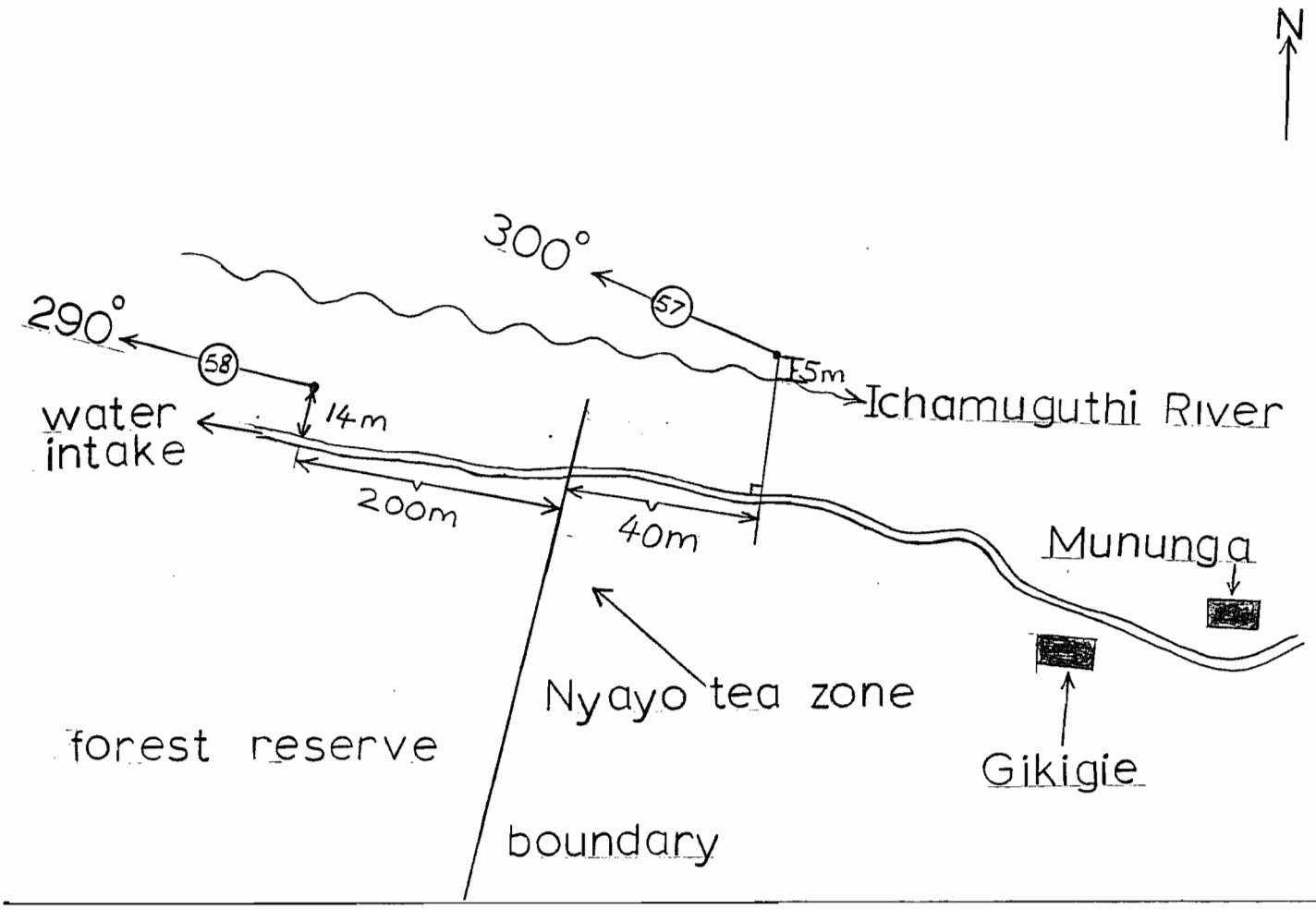
Transect 54 55.



Transect 56.

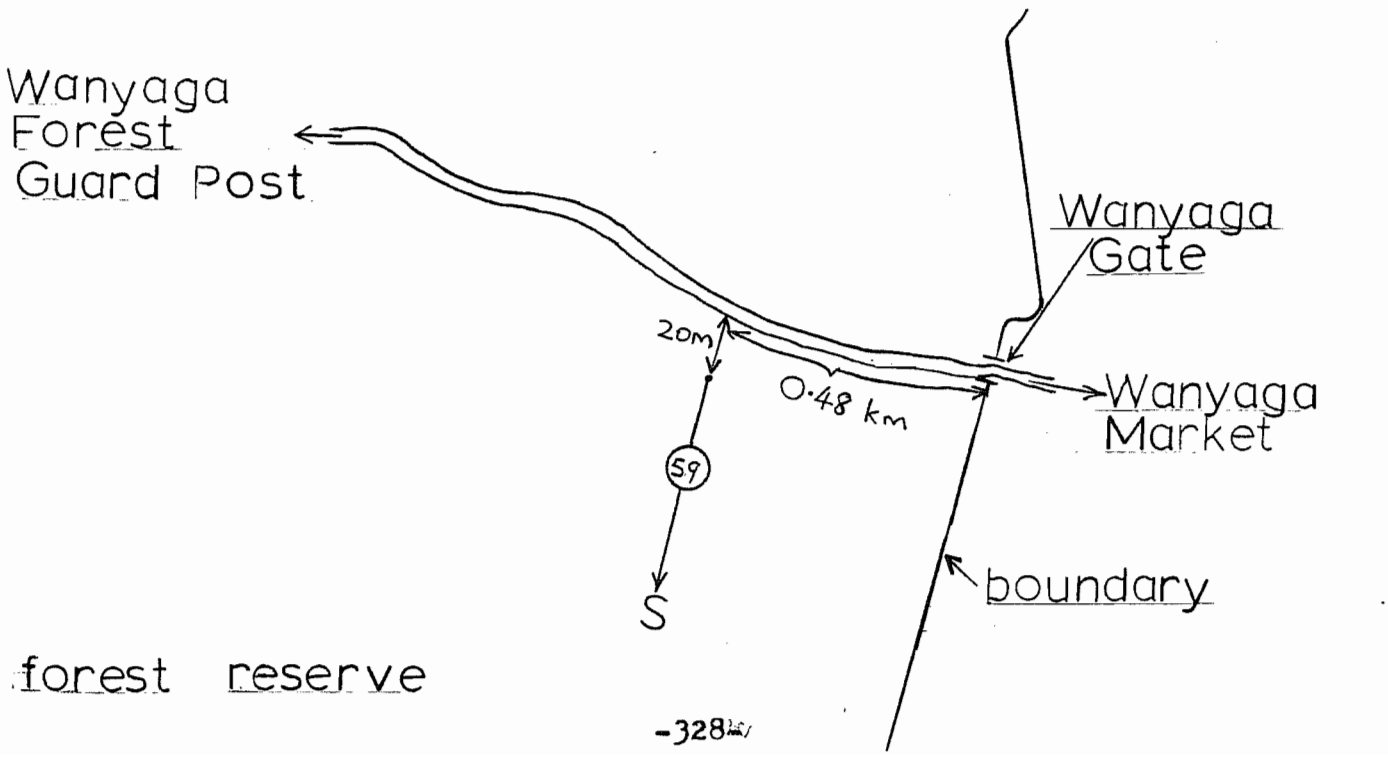


Transects 57, 58

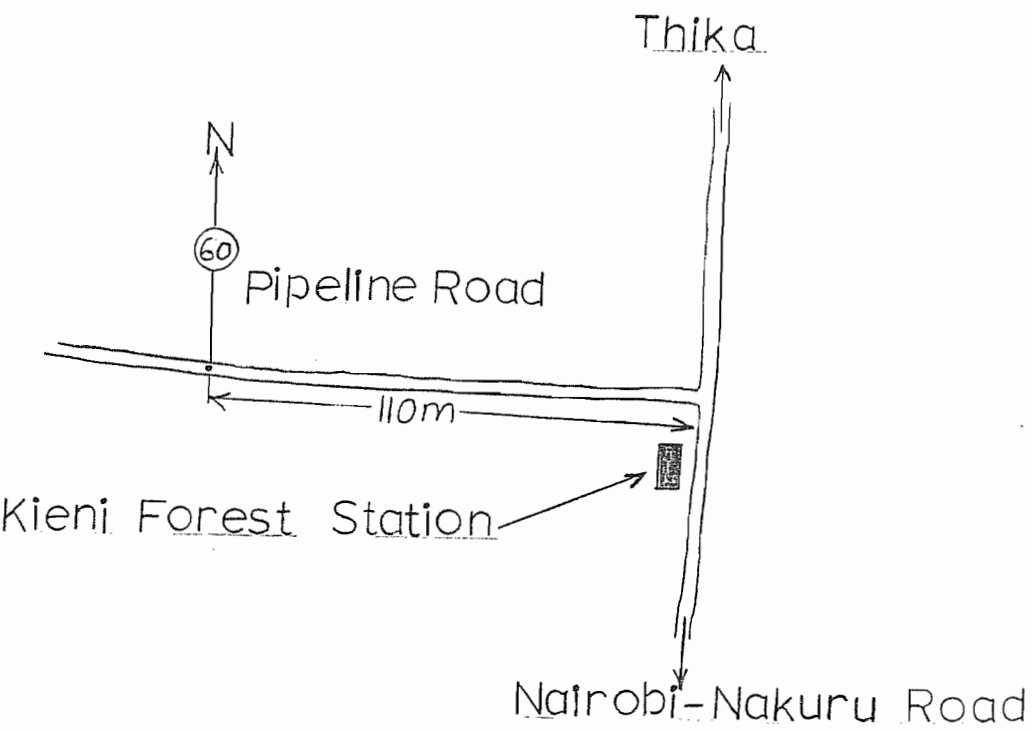


Transect 59

Latitude 0°47′0″S
Longitude 36°47′21″E

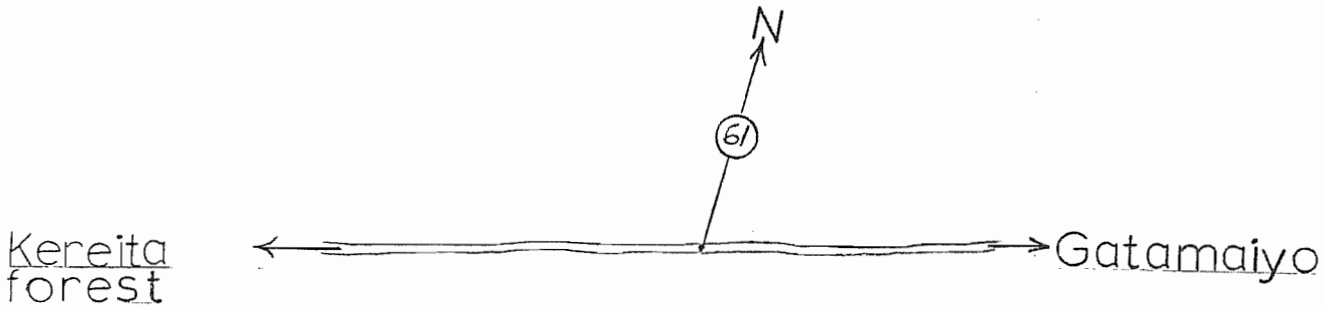


Transect 60



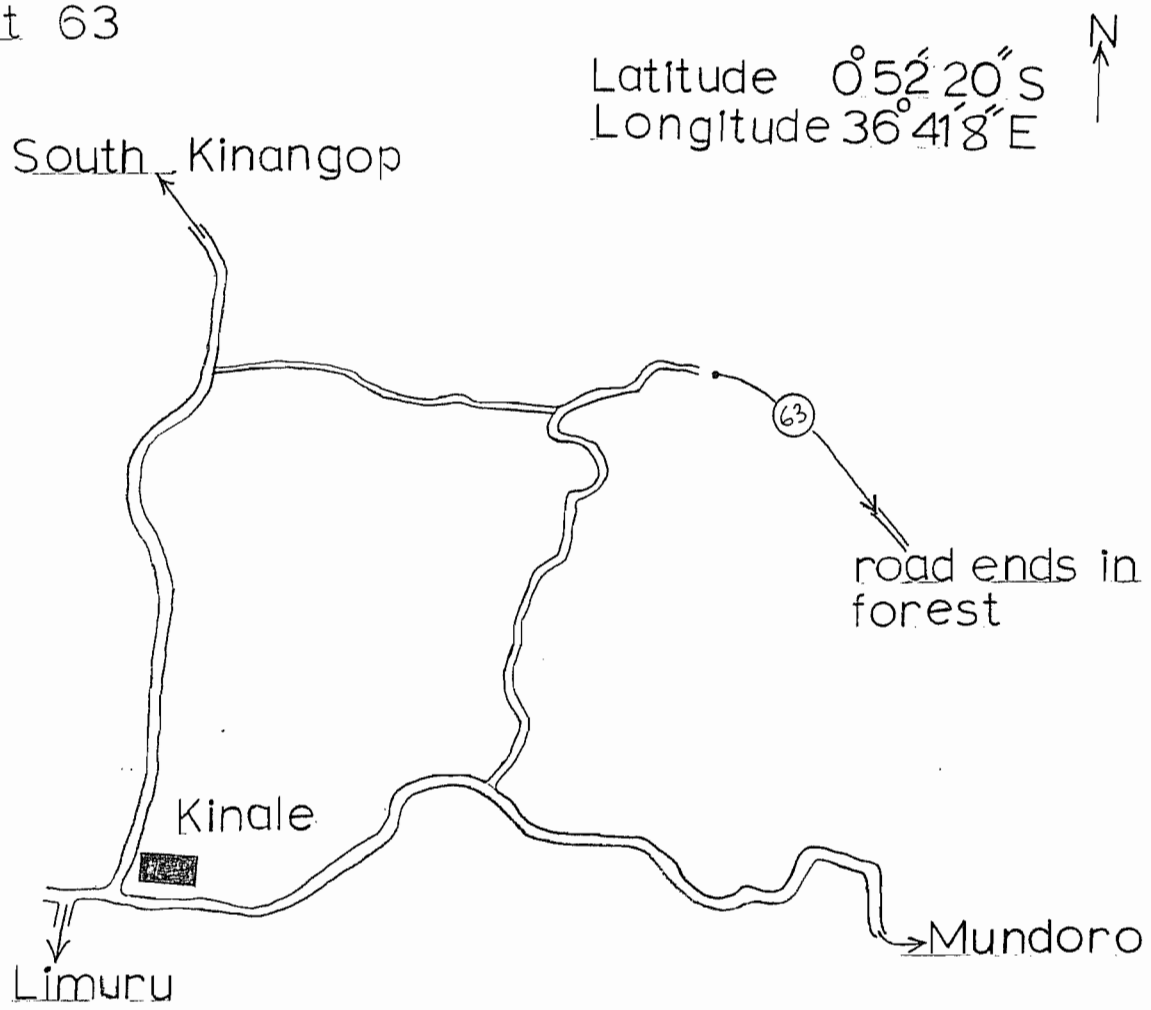
Transect 61

Latitude 0°57.75'S
Longitude 36°39.28'E

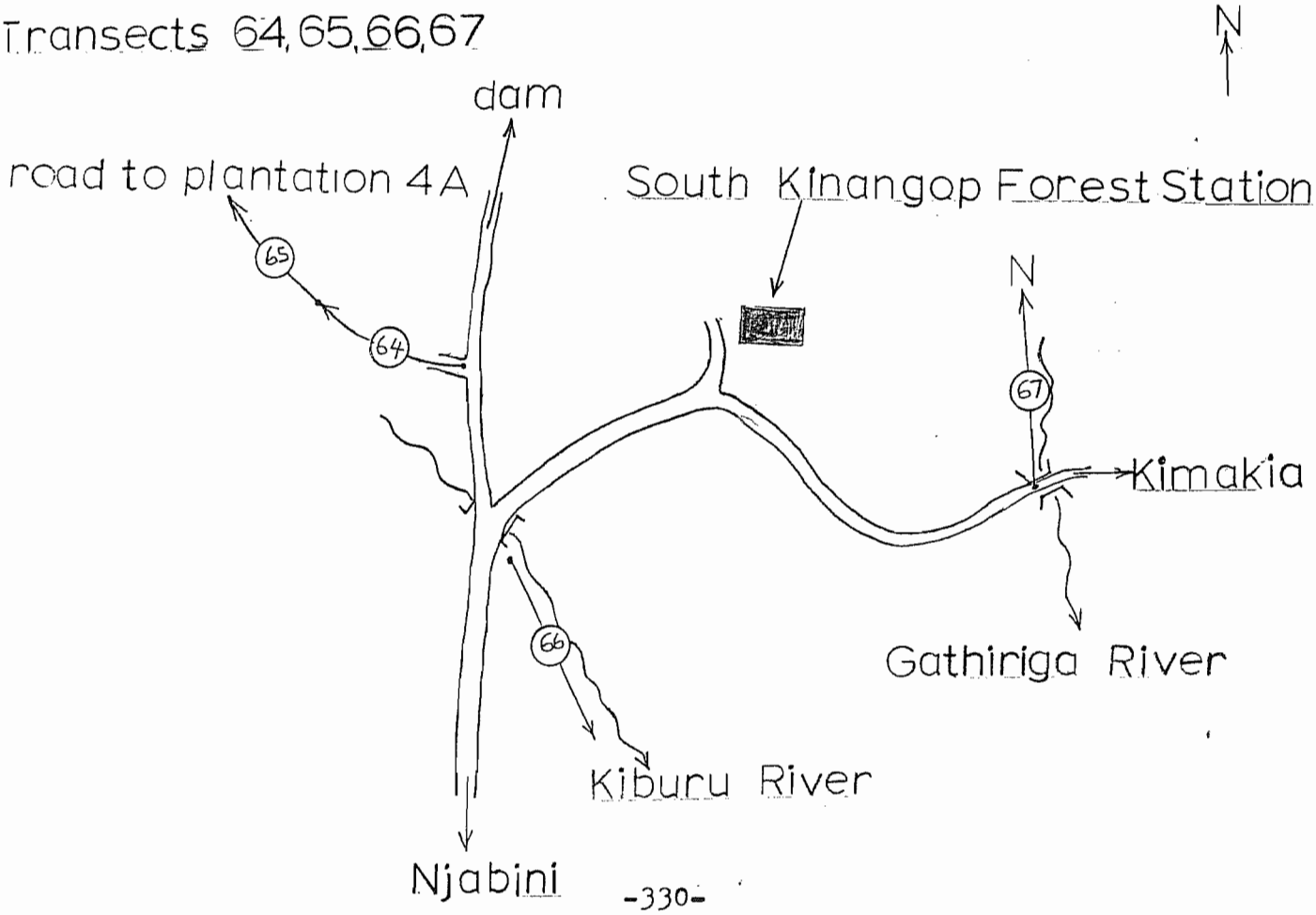


Transect 63

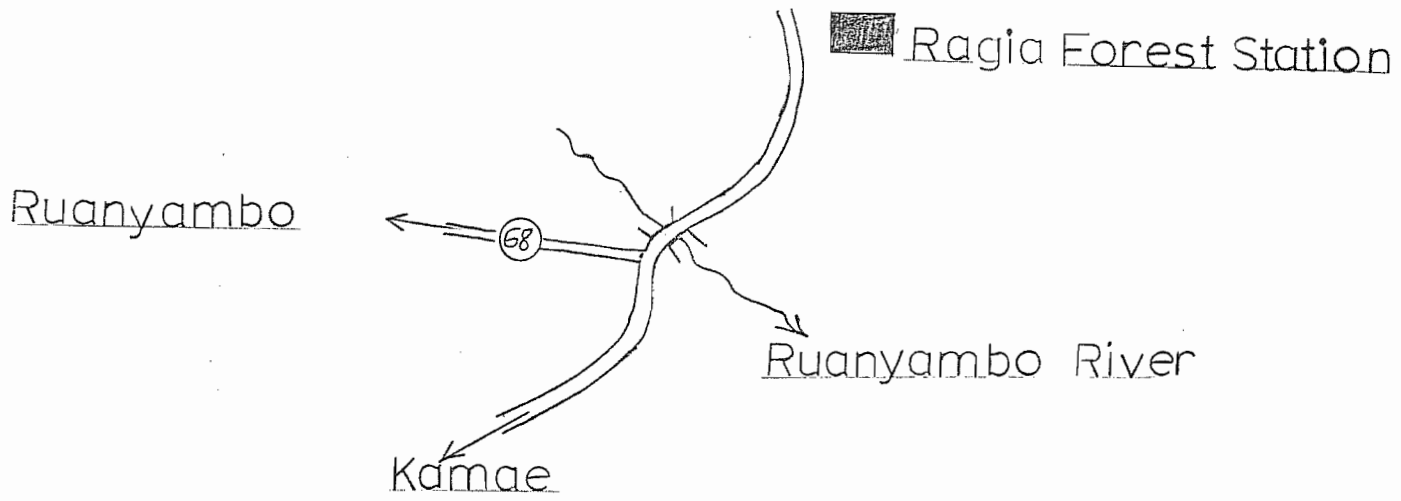
Latitude 0°52'20"S
Longitude 36°41'8"E



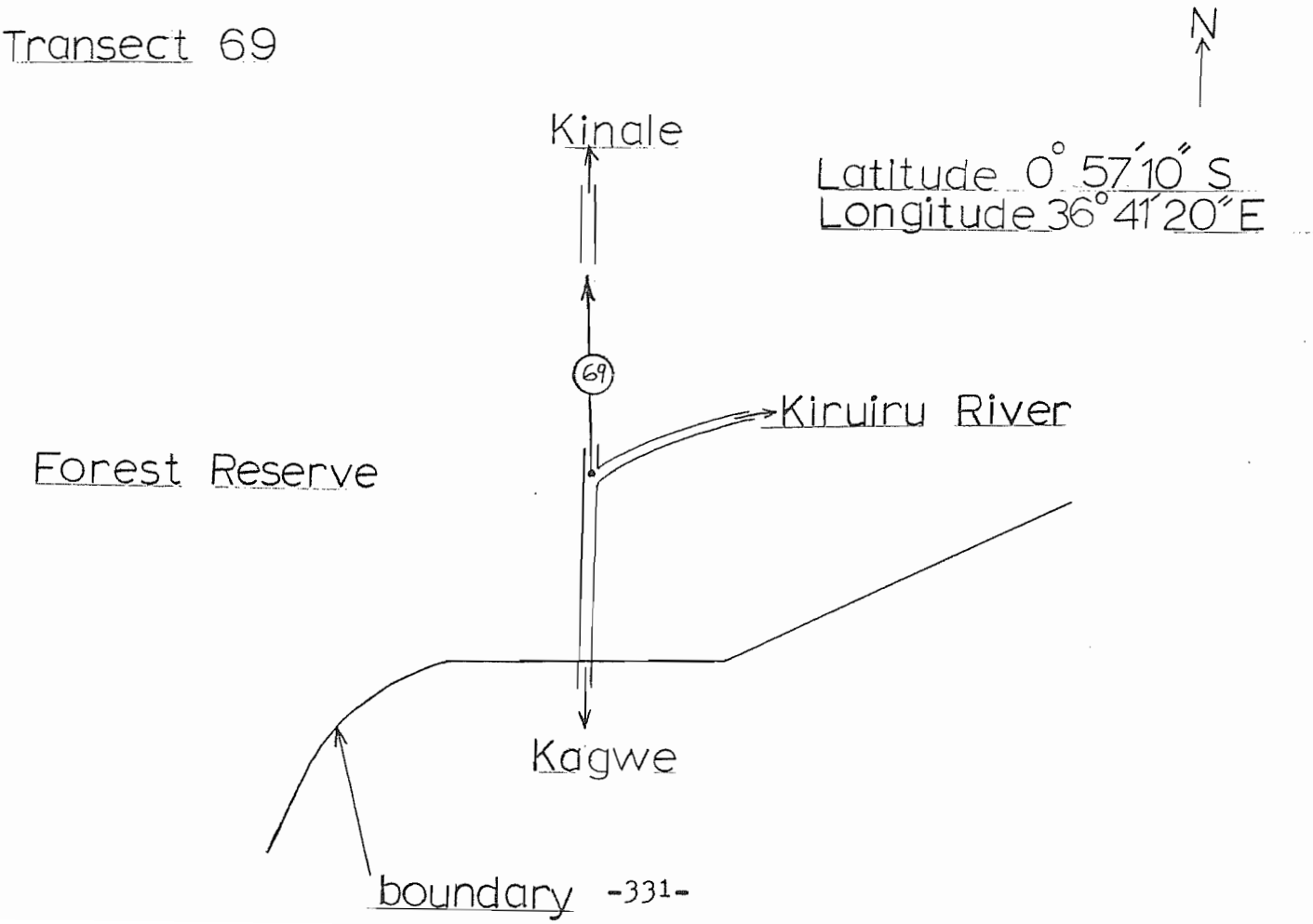
Transects 64, 65, 66, 67



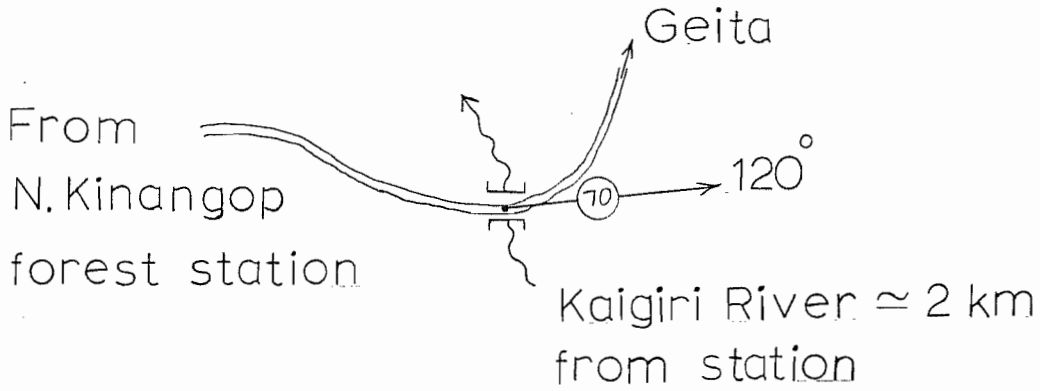
Transect 68



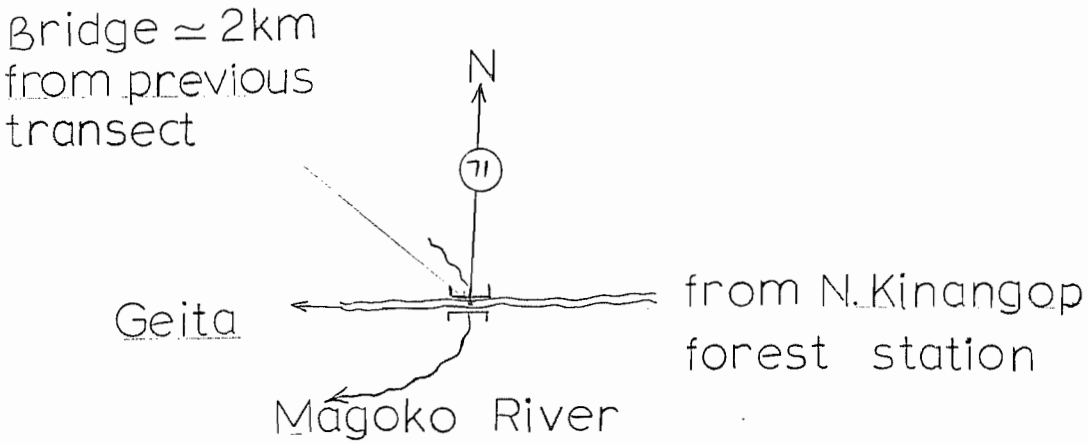
Transect 69



Transect 70



Transect 71 00° 32.29′ S
036° 38.45′ E



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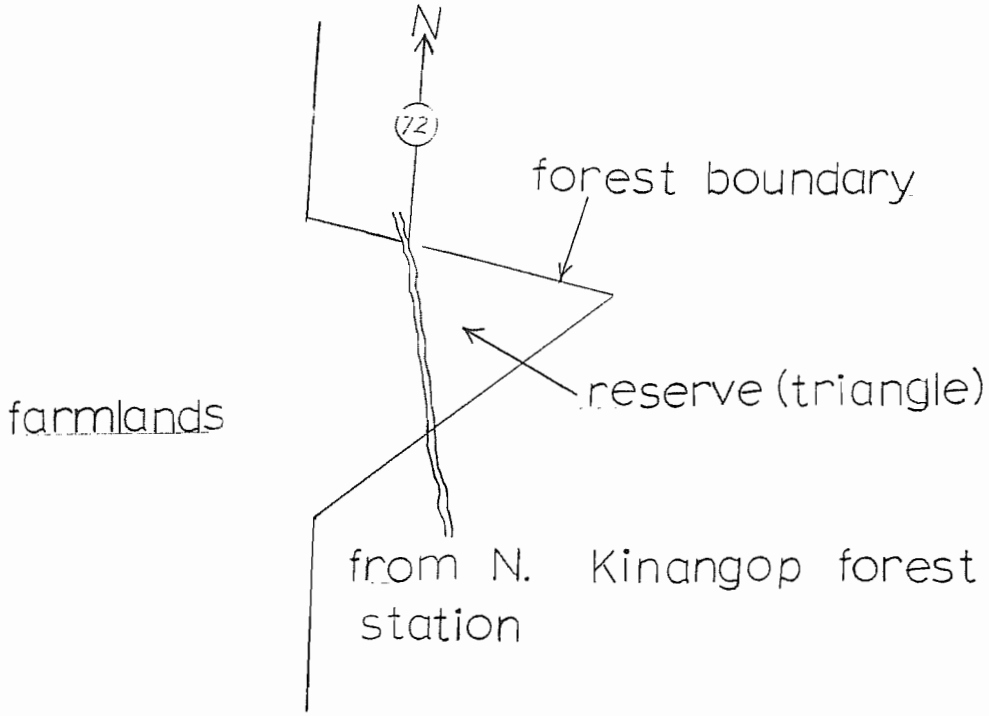

Transect 73 00° 34.88′ S
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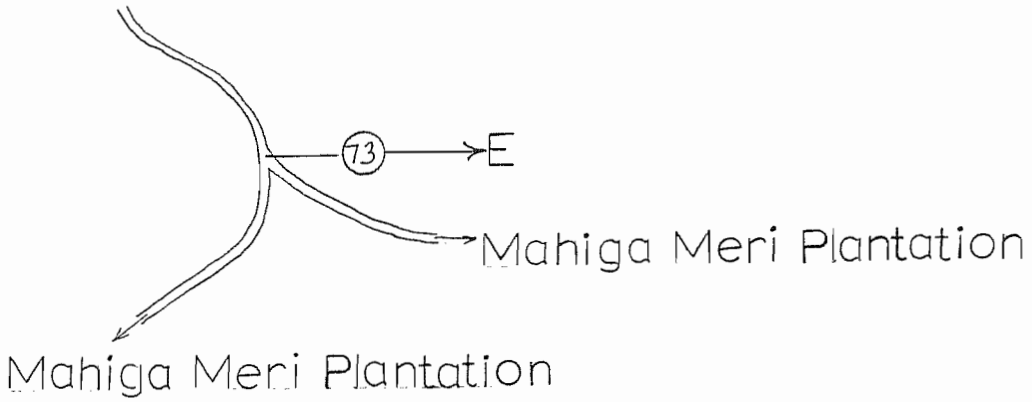
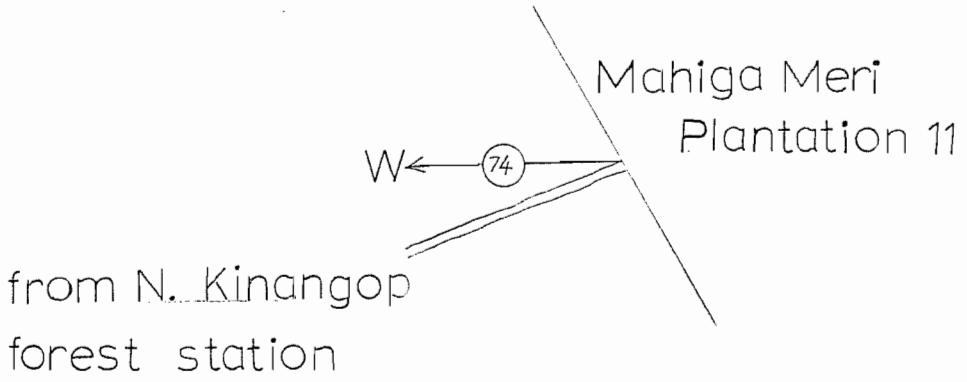
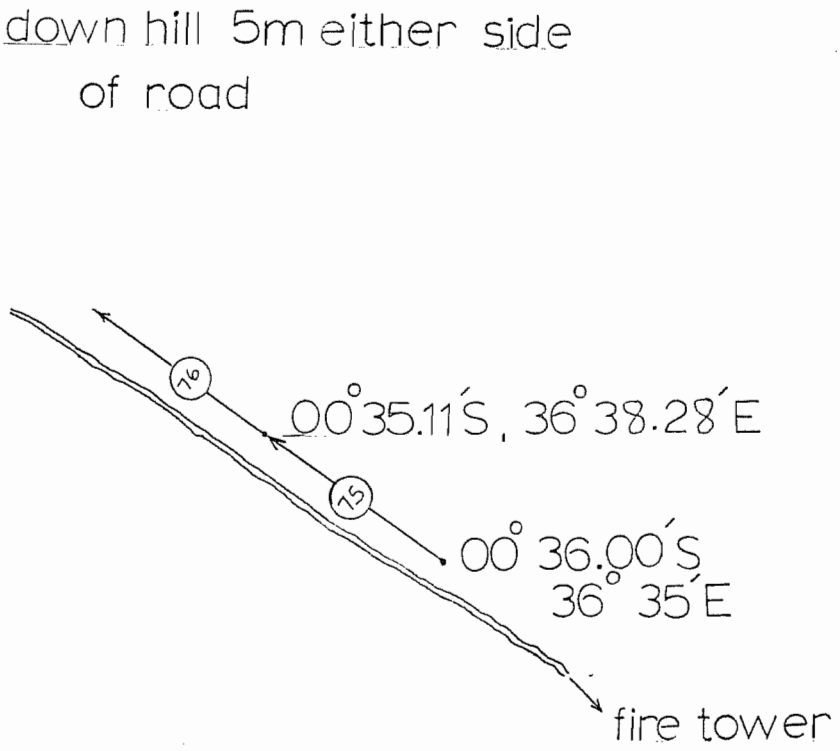


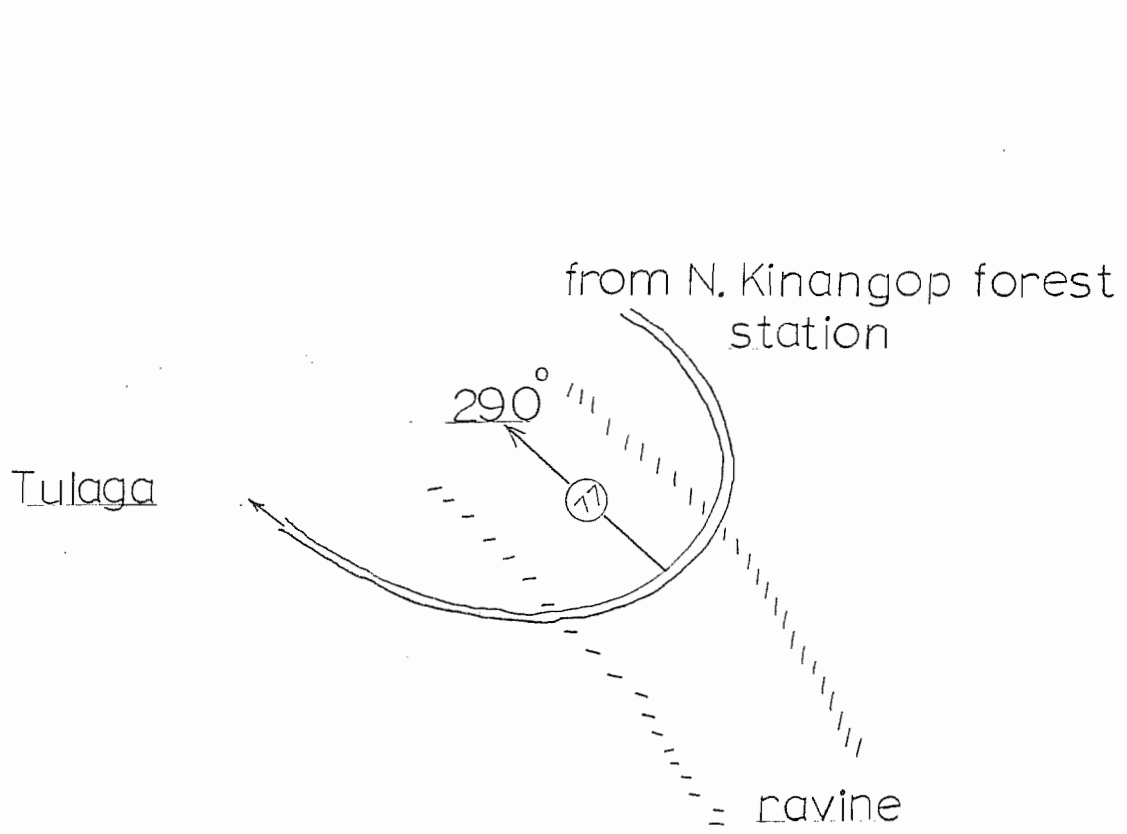
Transect 74



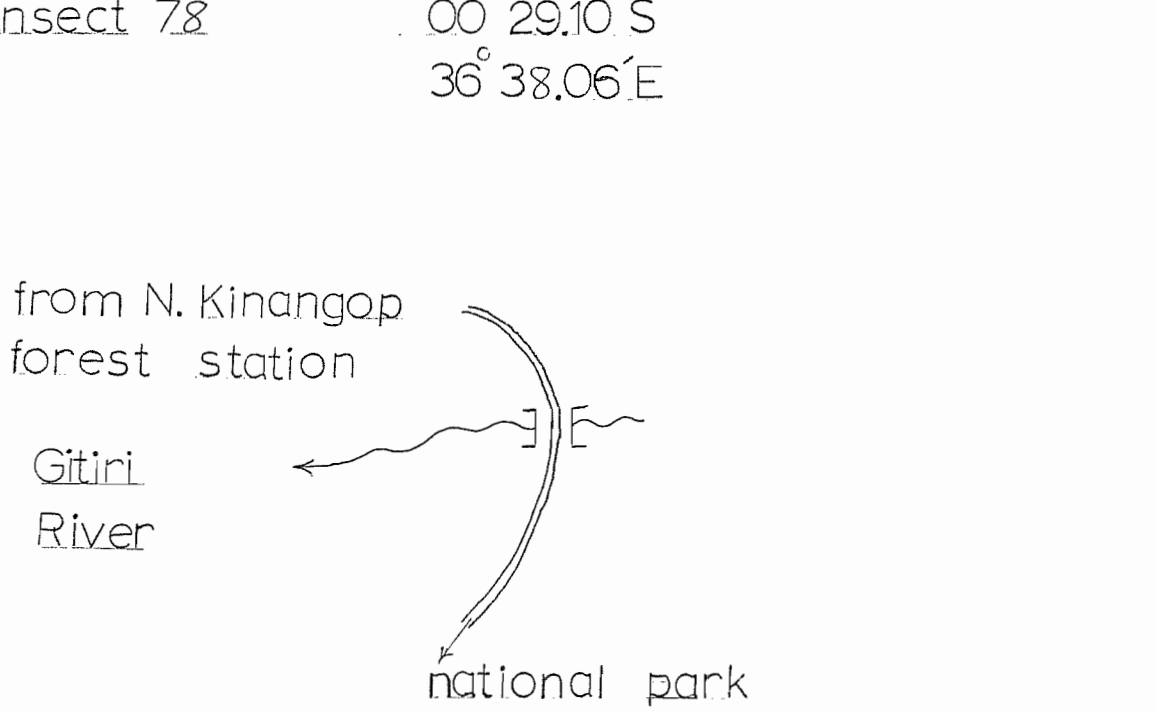
Transects 75, 76



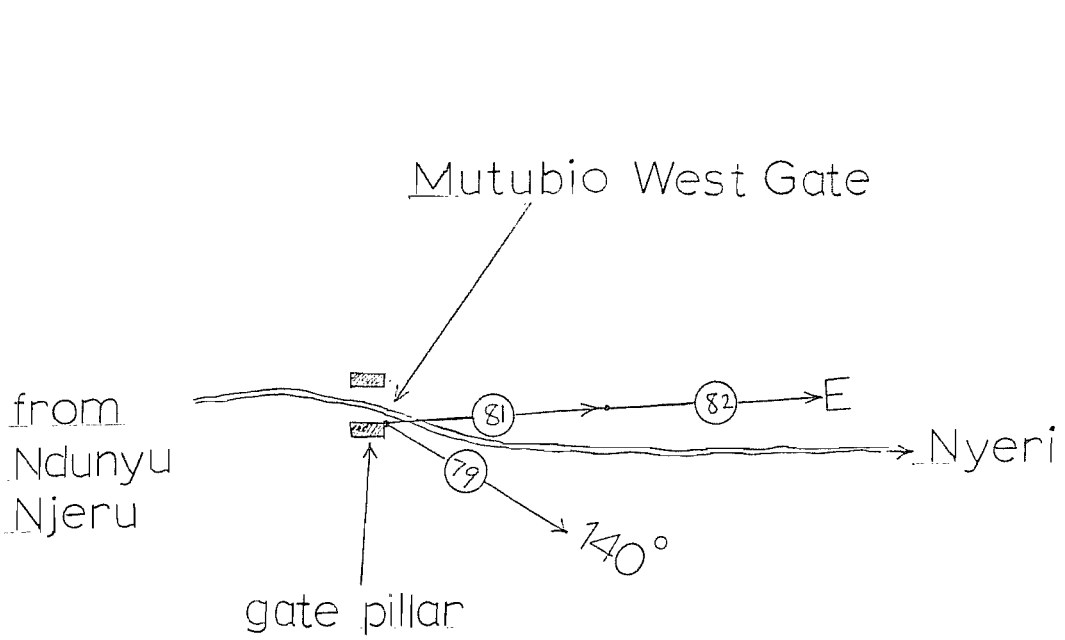
Transect 77



Transect 78 00° 29.10′S 36° 38.06′E



Transects 79, 81, 82



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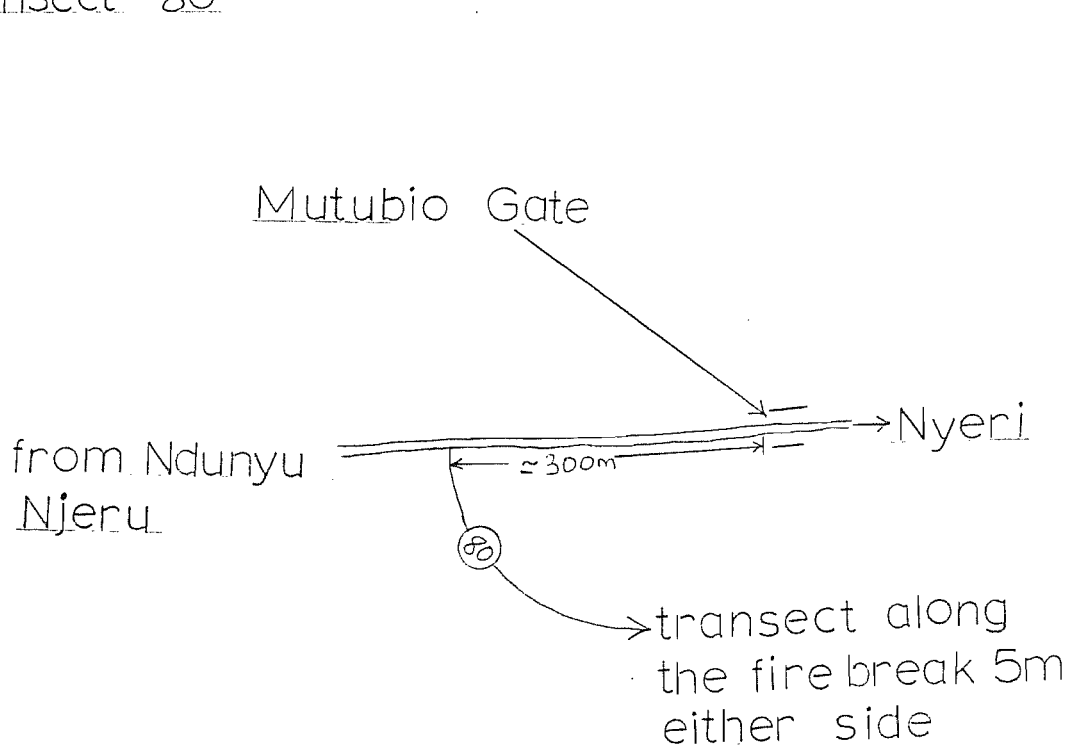
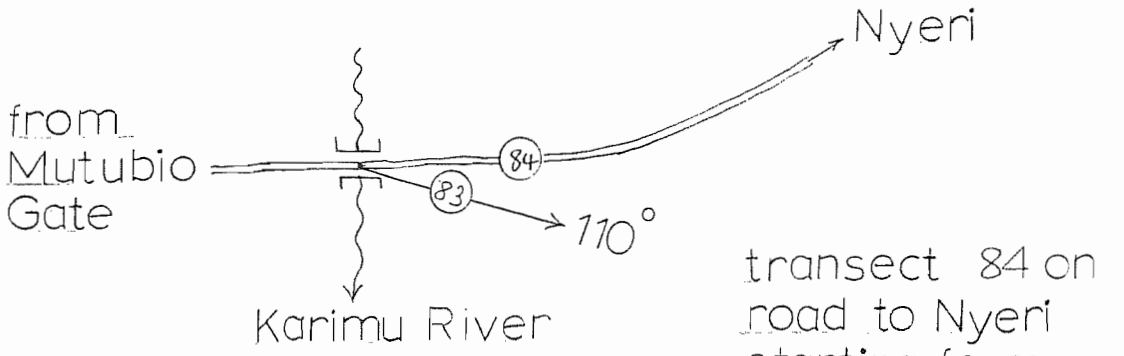


Transects 83, 84

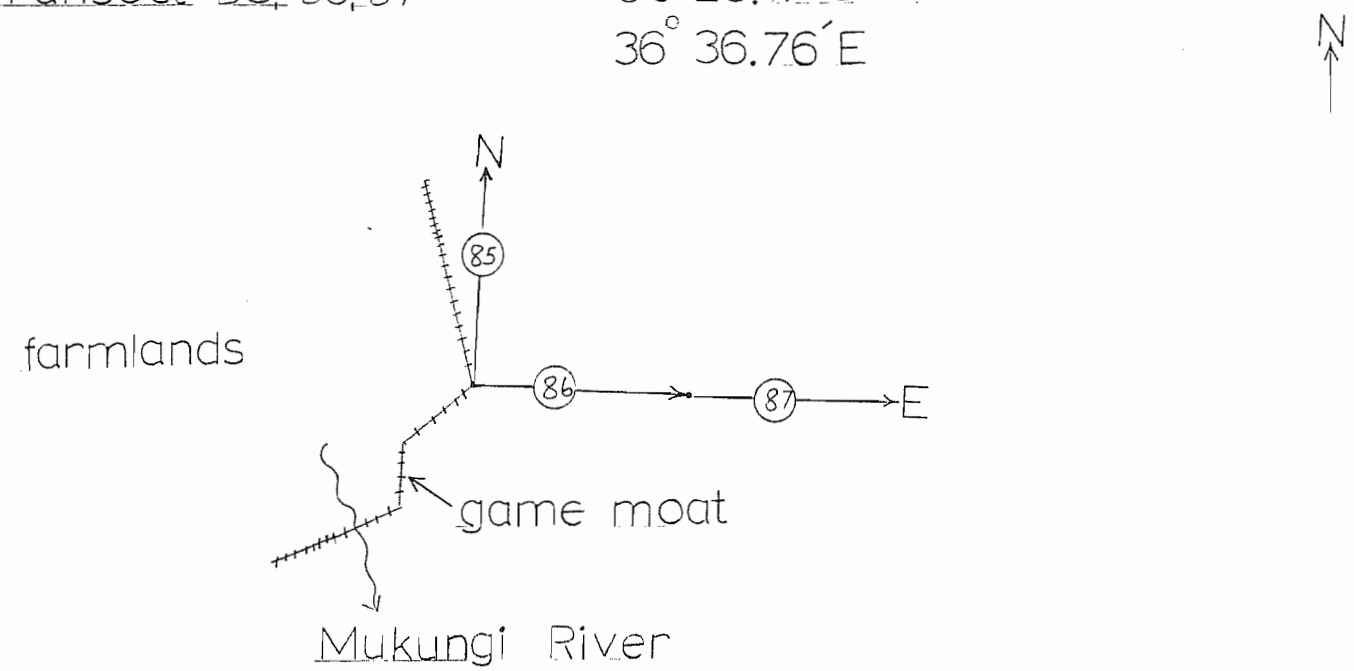


transect 84 on road to Nyeri starting from bridge. 5m either side

---

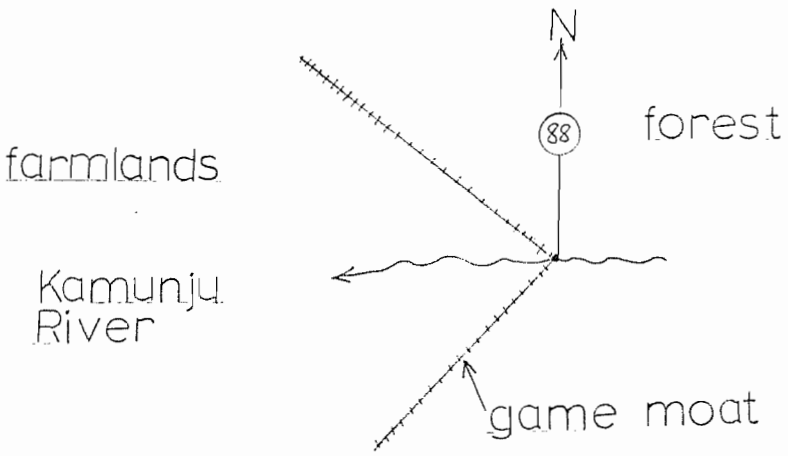
Transect 85, 86, 87

00° 26.17′ S
36° 36.76′ E



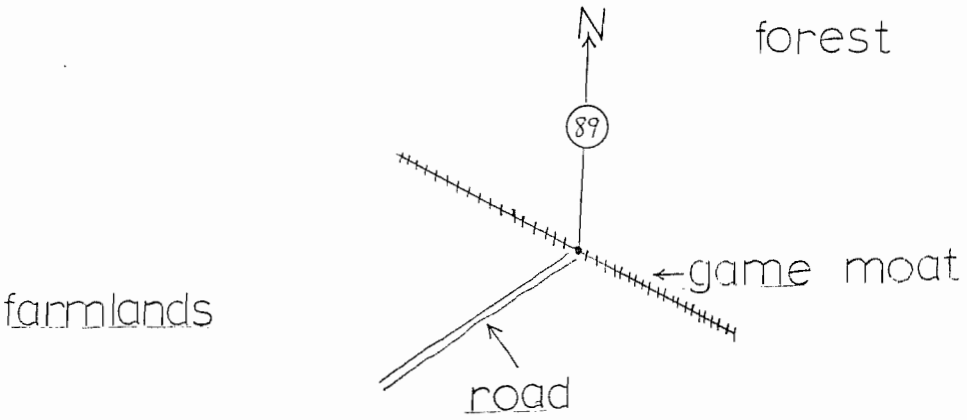
Transect 88

00 24.85 S
36° 35.95´E

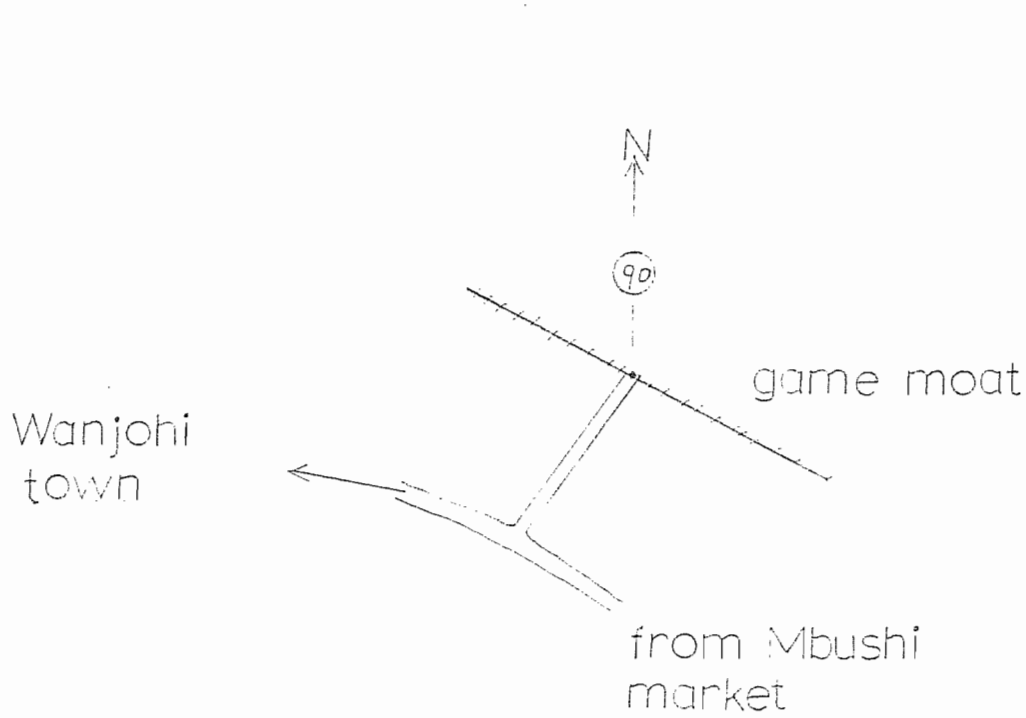


Transect 89

00° 23.00´ S
36° 34.24´ E

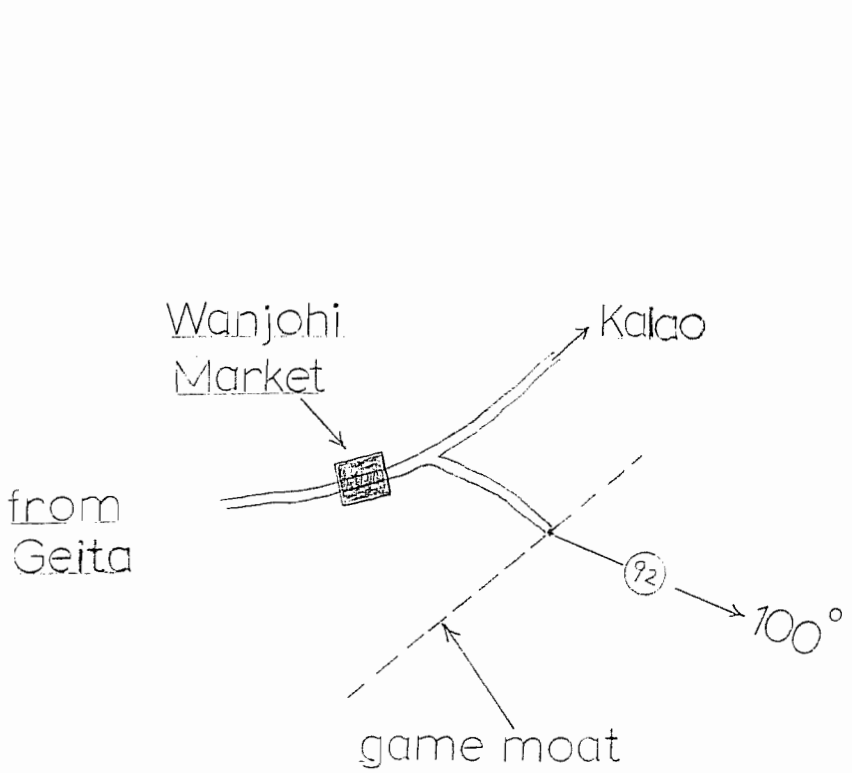


Transect 90 00° 19.50′ S
36° 32.37′ E

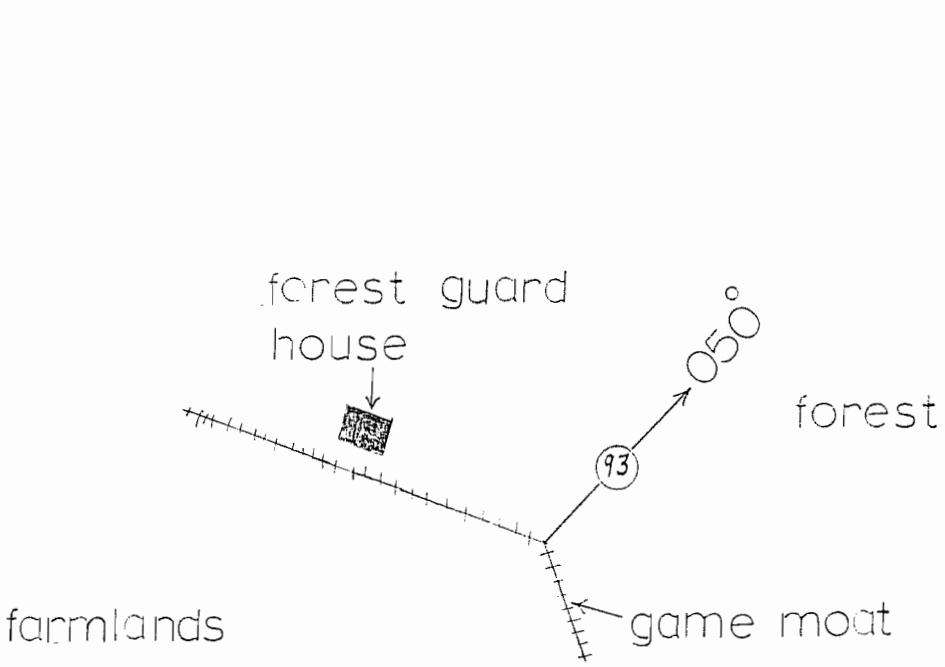


Transect 91 00° 21.09′ S
36° 33.10′ E

Transect 92 00°19.50'S
36°32.37'E



Transect 93 00°18.53'S
36°32.02'E



APPENDIX III

ABERDARES NATIONAL PARK AND ABERDARES FOREST RESERVES

WILDLIFE FENCE PLACEMENT STUDY

DISTRIBUTION AND ABUNDANCE OF BIRDS IN THE ABERDARES ECOSYSTEM, KENYA

DATA FOR FENCE ALIGNMENT DECISIONS AND LONG-TERM MONITORING OF IMPACT

by

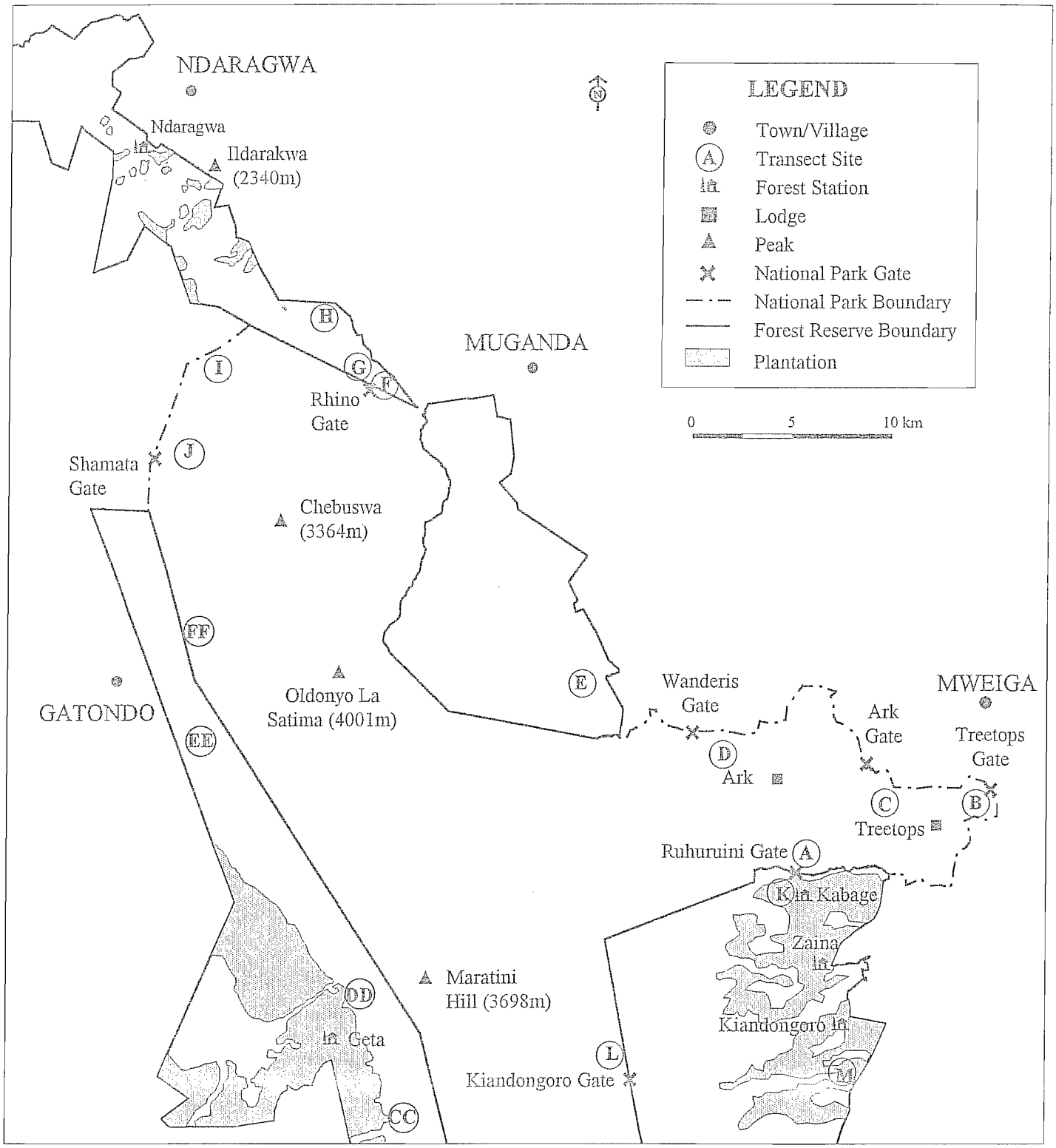
Thomas M. Butynski, PhD

1999

Table 17. Key to Map 19. Fifteen-minutes birds transect sites for the Aberdares Wildlife Fence Placement Study, Kenya (1997-98).

Phase	Site	Transects	Location
1	A	1,6,7	Ruhuruini Gate
	B	8,9,10,11,12	Treetops Gate
	C	13,14,15	Treetops Lodge
	D	16,17,18,19,20,21	Honi River Camp
2	E	22,23,24,25,26,27,28 29,30	Gakanga Ranger's Post
	F	31,32,33,34,35,38,39	Rhino Gate
3	G	40,41	Rhino Gate
	H	36,37	Kiriogo Hill
	I	44,45,46	Ndaragwa
	J	42,43,45,46,47,48,49, 50,51,52,53,54	Shamata Gate
4	K	2,3,4,5,	Ruhuruini Gate
	L	55,56,57,58	Kiandogoro Gate
	M	59,60,61	Hubuini Forest Guard Post
	N	62,63,64,65,66,67,68	Thuti Forest Guard Post
	O	69,70,71	Wanjerere Forest Station
5	P	72,73,74,75,76,77	Gatare/Katonva Gate
	Q	80,81,82,83	Mununga
	R	78,79	Gatare Forest Station
	S	84,85,86,87	Wanyaga
6	T	88,89,90,91,92	Karimenu River
	U	93,94,95,96,97	Kerita
	V	98,99,100,101	Near Thiririka River
	W	102,103,104,105	Ragia Forest Station
7	X	106,107,108	South Kinangop F. Station
	Y	109,110,111,112,113 114,115,116,117	Mutarakwa Forest Station (N. Kinangop)
	Z	118	Nyandarua Triangle
	AA	119,120,121,122,123, 124,125,126,127,128, 129,130	Laigiri River (North North Kinangop F. Station
	BB	131,132,133	Tulaga
	CC	134,135,136,137,138, 139,140,141,142	Nandarasi River, Mutubio Gate/Geta Road
8	DD	144,145,146,147,148, 150	Kamunju River (between Geta and Wanjohi)
	EE	151,152,153,154	Wanjohi Area
	FF	155,156,157,158	Gatondo (near Wanjohi)

Map19. Sites where 15 - minute bird censuses were conducted in the Aberdares Conservation Area, Kenya (1997 - 98). See Table 17.



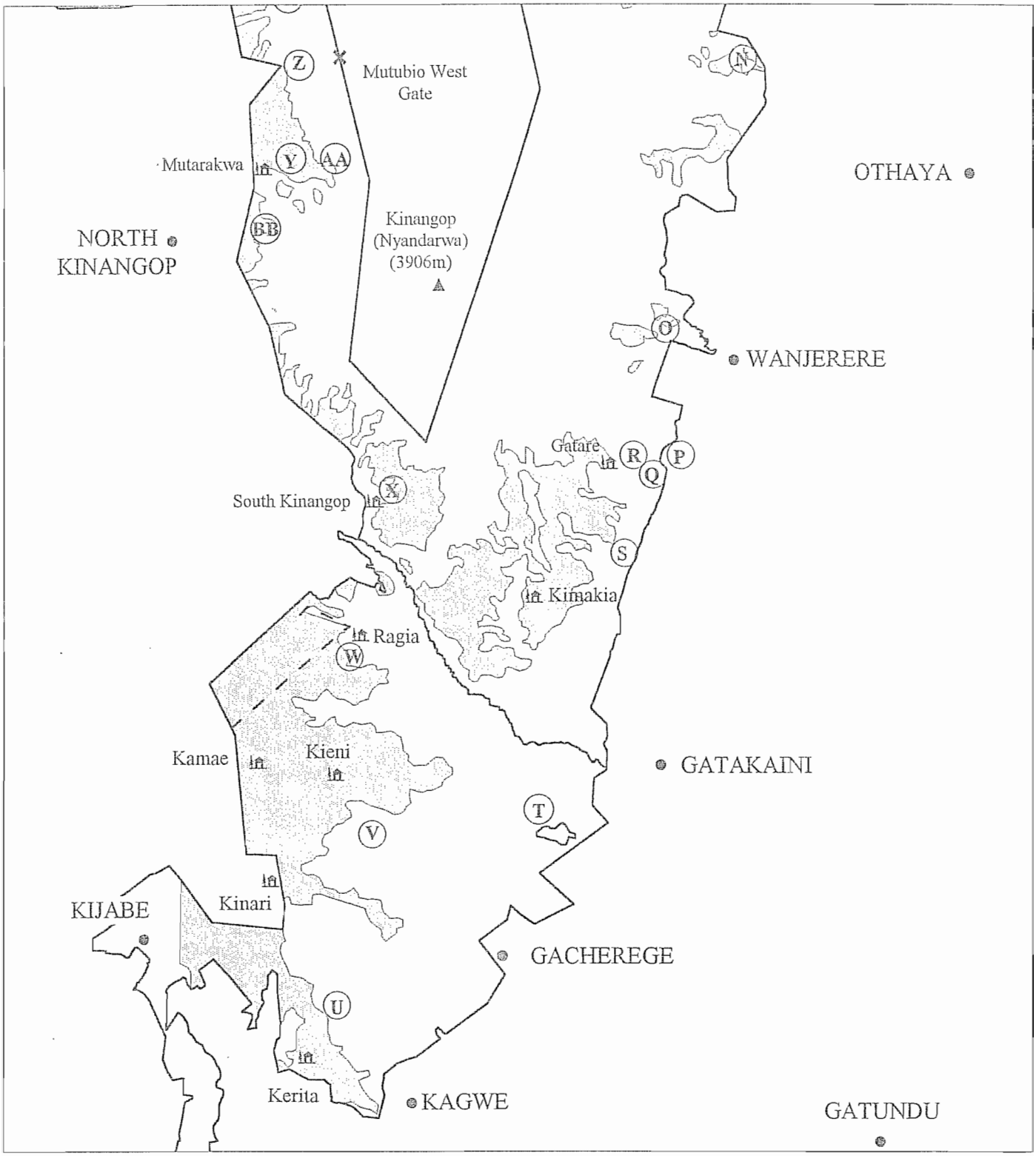

Z
Mutubio West Gate
N
Mutarakwa
Y
AA
OTHAYA
BB
Kinangop (Nyandarwa) (3906m)
NORTH KINANGOP
O
WANJERERE
Gatare
R
P
Q
South Kinangop
X
S
Kimakia
Ragia
W
Kamae
Kieni
GATAKAINI
T
V
KIJABE
Kinari
GACHEREGE
U
Kerita
KAGWE
GATUNDU

Table 18. Species of forest birds in the Aberdares ecosystem, Kenya. Compiled from 158 15-minute censuses along transects, from opportunistic observations during about 100 days of field work, and from records provided by the Ornithology Department, National Museums of Kenya. F = "forest generalist" and FF = "forest dependent" according to Bennun et al. (1996).

Species number	F or FF	Common name	Scientific name
63	FF	African Green Ibis	*Bostrychia olivacea*
*97	F	African Cuckoo Hawk	*Aviceda cuculoides*
98	F	Eurasian Honey Buzzard	*Pernis apivorus*
*99	F	Bat Hawk	*Macheiramphus alcinus*
*114	F	Banded Snake Eagle	*Circaetus cinerascens*
125	F	African Goshawk	*Accipiter tachiro*
*130	FF	Little Sparrowhawk	*Accipiter minullus*
*133	F	Rufous-breasted Sparrowhawk	*Accipiter rufiventris*
134	F	Great Sparrowhawk	*Accipiter melanoleucus*
139	FF	Mountain Buzzard	*Buteo oreophilus*
*154	F	Ayres's Hawk-Eagle	*Hieraaetus ayresii*
157	FF	African Crowned Eagle	*Stephanoaetus coronatus*
*166	F	African Hobby	*Falco cuvieri*
195	F	Scaly Francolin	*Francolinus squamatus*
196	F	Jackson's Francolin	*Francolinus jacksoni*
*202	F	Crested Guineafowl	*Guttera pucherani*
354	F	African Green Pigeon	*Treron calva*
357	F	Tambourine Dove	*Turtur tympanistria*
364	FF	Eastern Bronze-naped Pigeon	*Columba delegorguei*
365	FF	Olive Pigeon	*Columba arquatrix*
369	FF	Lemon Dove	*Aplopelia larvata*
380	FF	Red-fronted Parrot	*Poicephalus gulielmi*
398	FF	Hartlaub's Turaco	*Tauraco hartlaubi*
*408	FF	Black Cuckoo	*Cuculus clamosus*
409	F	Red-chested Cuckoo	*Cuculus solitarius*
416	FF	Barred Long-tailed Cuckoo	*Cercococcyx montanus*
*417	F	African Emerald Cuckoo	*Chrysococcyx cupreus*
*421	F	Yellowbill	*Ceuthmochares aereus*
*443	F	African Barred Owlet	*Glaucidium capense*
444	F	African Wood Owl	*Strix woodfordii*
449	F	Montane Nightjar	*Caprimulgus poliocephalus*
*467	F	Mottled Spinetail	*Telecanthura ussheri*

Table 18. (continued).

Species number	F or FF	Common name	Scientific name
468	F	Scarce Swift	*Schoutedenapus myoptilus*
484	F	Narina Trogon	*Apaloderma narina*
485	FF	Bar-tailed Trogon	*Apaloderma vittatum*
*493	F	Half-collared Kingfisher	*Alcedo semitorquata*
514	F	Cinnamon-chested Bee-eater	*Merops oreobates*
525	FF	White-headed Wood-hoopoe	*Phoeniculus bollei*
543	FF	Crowned Hornbill	*Tockus alboterminatus*
*547	F	Trumpeter Hornbill	*Bycanistes bucinator*
549	F	Silvery-cheeked Hornbill	*Bycanistes brevis*
560	FF	Moustached Green Tinkerbird	*Pogoniulus leucomystax*
563	F	Yellow-rumped Tinkerbird	*Pogoniulus bilineatus*
*590	FF	Least Honeyguide	*Indicator exilis*
606	FF	Fine-banded Woodpecker	*Campethera tullbergi*
*619	FF	African Broadbill	*Smithornis capensis*
*622	FF	African Pitta	*Pitta angolensis*
*675	F	Grey Wagtail	*Motacilla cinerea*
676	F	Mountain Wagtail	*Motacilla clara*
702	F	Yellow-whiskered Greenbul	*Andropadus latirostris*
703	FF	Slender-billed Greenbul	*Andropadus gracilirostris*
705	FF	Mountain Greenbul	*Andropadus nigriceps*
713	FF	Cabanis's Greenbul	*Phyllastrephus cabanisi*
719	FF	Yellow-streaked Greenbul	*Phyllastrephus flavostriatus*
737	FF	African Hill Babbler	*Pseudoalcippe abyssinica*
*751	FF	Mountain Illadopsis	*Illadopsis pyrrhoptera*
756	F	White-starred Robin	*Pogonocichla stellata*
771	F	Ruppell's Robin-Chat	*Cossypha semirufa*
778	FF	Brown-chested Alethe	*Alethe poliocephala*
816	F	Olive Thrush	*Turdus olivaceus*
*825	FF	Orange Ground Thrush	*Zoothera gurneyi*
826	FF	Abyssinian Ground Thrush	*Zoothera piaggiae*
831	F	African Dusky Flycatcher	*Muscicapa adusta*
840	F	White-eyed Slaty Flycatcher	*Melaenornis fischeri*
870	F	Blackcap	*Sylvia atricapilla*
*872	F	Chiffchaff	*Phylloscopus collybita*
876	F	Brown Woodland Warbler	*Phylloscopus umbrovirens*
*883	FF	Evergreen Forest Warbler	*Bradypterus lopezi*
884	F	Cinnamon Bracken Warbler	*Bradypterus cinnamomeus*

Table 18. (continued).

Species number	F or FF	Common name	Scientific name
892	F	Mountain Yellow Warbler	*Chloropeta similis*
898	F	Hunter's Cisticola	*Cisticola hunteri*
940	F	Chestnut-throated Apalis	*Apalis porphyrolaema*
945	FF	Grey Apalis	*Apalis cinerea*
*947	FF	Black-headed Apalis	*Apalis melanocephala*
948	FF	Black-throated Apalis	*Apalis jacksoni*
950	F	Black-collared Apalis	*Apalis pulchra*
967	FF	White-browed Crombec	*Sylvietta leucophrys*
982	F	Montane White-eye	*Zosterops poliogaster*
1002	FF	White-tailed Crested Flycatcher	*Trochocercus albonotatus*
*1020	F	Black-throated Wattle-eye	*Platysteira peltata*
1053	FF	Black-fronted Bush-Shrike	*Malaconotus nigrifrons*
*1055	F	Doherty's Bush-Shrike	*Malaconotus dohertyi*
*1071	F	Northern Puffback	*Dryoscopus gambensis*
1072	F	Black-backed Puffback	*Dryoscopus cubla*
*1079	FF	Purple-throated Cuckoo-shrike	*Campephaga quiscalina*
1080	FF	Grey Cuckoo-shrike	*Coracina caesia*
1088	FF	Montane Oriole	*Oriolus percivali*
*1102	FF	Waller's Starling	*Onychognathus walleri*
*1105	F	Slender-billed Starling	*Onychognathus tenuirostris*
*1122	FF	Abbott's Starling	*Cinnyricinclus femoralis*
*1123	FF	Sharpe's Starling	*Cinnyricinclus sharpii*
1140	F	Collared Sunbird	*Anthreptes collaris*
1143	FF	Olive Sunbird	*Nectarinia olivacea*
*1146	F	Green-headed Sunbird	*Nectarinia verticalis*
1159	F	Northern Double-collared Sunbird	*Nectarinia preussi*
1161	F	Eastern Double-collared Sunbird	*Nectarinia mediocris*
1181	F	Malachite Sunbird	*Nectarinia famosa*
*1183	F	Superb Sunbird	*Nectarinia superba*
*1211	FF	Black-billed Weaver	*Ploceus melanogaster*
1240	FF	Brown-capped Weaver	*Ploceus insignis*
1269	F	Grey-headed Negrofinch	*Nigrita canicapilla*
1279	F	Abyssinian Crimsonwing	*Cryptospiza alvadorii*
*1287	FF	Green-backed Twinspot	*Mandingoa nitidula*
1305	F	Black-headed Waxbill	*Estrilda atricapilla*
1344	FF	Thick-billed Canary	*Serinus burtoni*

* Species not seen during 1997-98 Aberdares wildlife fence study.

Table 19. Summary of bird species richness along each of eight phases of the proposed wildlife fence around the Aberdares ecosystem, Kenya (1997-98). Data obtained from 158 15-minute censuses along transects. See Table 17 and Map 19.

Phase	1	2	3	4	5	6	7	8	Total or mean
Number of transects	17	16	17	18	19	14	50	7	158
Total birds	151	155	122	166	154	129	325	50	1252
Total species	65	42	43	57	45	39	56	21	121
Mean species/ transect	8.9	9.7	7.2	9.2	8.1	9.2	6.5	7.1	7.9

Table 20. Summary of data on the abundance and altitudinal distribution of species of birds in the Aberdares ecosystem, Kenya (1997-98). Data obtained from 158 15-minute censuses along transects and opportunistic observations during about 100 days of field work. No censuses were conducted from 6501-7000 feet. The number of censuses on which each species was found in each range of altitude is given. All common and scientific names according to EANHS (1996).

Elevation (feet)		6000-6500	6501-7000	7001-7500	7501-8000	8001-8500	8501-9000	9001-9500	9501-10000	10001-10500	10501-11000	Total	Elevation range (feet)
Species number	Species												
37	Cattle Egret *Bubulcus ibis*	1										1	6000-6500
*52	Hamerkop *Scopus umbretta*		*									*	6500-7000
62	Hadada Ibis *Bostrychia hagedash*	1	*	2	2	5	2	1				13	6000-9500
63	African Green Ibis *Bostrychia olivacea*							*	1			1	9000-10000
79	African Black Duck *Anas sparsa*			1	*							1	7000-8000
85	Yellow-billed Duck *Anas undulata*								1			1	9500-10000
*98	Eurasian Honey Buzzard *Pernis apivorus*				*		*					*	7500-9000
*100	Black-shouldered Kite *Elanus caeruleus*				*		*					*	7500-9000
117	African Harrier Hawk *Polyboroides typus*	1		*		*						1	6000-8500
125	African Goshawk *Accipiter tachiro*							1	1			2	9000-10000
134	Great Sparrowhawk *Accipiter melanoleucus*				1							1	7500-8000
139	Mountain Buzzard *Buteo oreophilus*	2		2		4	*	3	4			15	6000-10000
142	Augur Buzzard *Buteo augur*		*	*	1	3	1	3		1		9	6500-10500
155	Long-crested Eagle *Lophaetus occipitalis*	1	*		1	1	1	1				5	6000-9500
157	African Crowned Eagle *Stephanoaetus coronatus*			*		1			1			2	8000-10000
*158	Martial Eagle *Polemaetus bellicosus*				*		*					*	7500-9000
173	Greater Kestrel *Falco rupicoloides*					1						1	8000-8500
195	Scaly Francolin *Francolinus squamatus*							1	1			2	9000-10000
196	Jackson's Francolin *Francolinus jacksoni*	1	*	*	*	*	*	2	2		*	5	6000-11000
*199	Yellow-necked Spurfowl *Francolinus leucoscepus*		*									*	6500-7000
*312	Green Sandpiper *Tringa ochropus*		*			*						*	6500-8500
354	African Green Pigeon *Treron calva*	1	*		*							1	6000-8000

Table 20. (continued).

Elevation (feet)		6000-6500	6501-7000	7001-7500	7501-8000	8001-8500	8501-9000	9001-9500	9501-10000	10001-10500	10501-11000	Total	Elevation range (feet)
Species number	Species												
357	Tambourine Dove *Turtur tympanistria*			4	1							5	7000-8000
358	Blue-spotted Wood Dove *Turtur afer*			1								1	7000-7500
*364	Eastern Bronze-naped Pigeon *Columba delegorguei*			*	*							*	7000-8000
365	Olive Pigeon *Columba arquatrix*	1		*	3	3	5	8	*			20	6000-10000
366	Speckled Pigeon *Columba guinea*					2						2	8000-8500
*369	Lemon Dove *Aplopelia larvata*				*							*	7500-8000
370	Red-eyed Dove *Streptopelia semitorquata*	5		1	10	5	5	4				30	6000-9500
373	Ring-necked Dove *Streptopelia capicola*	3			5	4	4	5				21	6000-9500
376	Dusky Turtle Dove *Streptopelia lugens*					6	3	4	1			14	8000-10000
377	Laughing Dove *Streptopelia senegalensis*					1			1			2	8000-10000
380	Red-fronted Parrot *Poicephalus gulielmi*		*	5	5	3	2	8				23	6500-9500
398	Hartlaub's Turaco *Tauraco hartlaubi*		*	19	20	17	4	9	2	2		73	6500-10500
409	Red-chested Cuckoo *Cuculus solitarius*			*		1						1	7000-8500
*420	Diederik Cuckoo *Chrysococcyx caprius*				*							*	7500-8000
422	White-browed Coucal *Centropus superciliosus*	3		3	2	*			1			9	6000-10000
*436	Spotted Eagle-Owl *Bubo africanus*							*				*	9000-9500
*444	African Wood Owl *Strix woodfordii*			*	*	*						*	7000-8500
*449	Montane Nightjar *Caprimulgus poliocephalus*		*	*		*		*	*	*		*	6500-10500
*457	Eurasian Nightjar *Caprimulgus europaeus*					*			*			*	8000-10000
468	Scarce Swift *Schoutedenapus myoptilus*				*	1		1				2	7500-9500
*471	African Black Swift *Apus barbatus*				*							*	7500-8000
*475	Mottled Swift *Apus aequatorialis*						*					*	8500-9000
*476	Alpine Swift *Apus melba*				*		*					*	7500-9000
480	Speckled Mousebird *Colius striatus*	1	*	*	1	1	1					4	6000-9000
484	Narina Trogon *Apaloderma narina*					7	3		1			11	8000-10000
485	Bar-tailed Trogon *Apaloderma vittatum*				1							1	7500-8000

Table 20. (continued).

Elevation (feet)		6000-6500	6501-7000	7001-7500	7501-8000	8001-8500	8501-9000	9001-9500	9501-10000	10001-10500	10501-11000	Total	Elevation range (feet)
Species number	Species												
*499	Giant Kingfisher *Megaceryle maxima*				*							*	7500-8000
514	Cinnamon-chested Bee-eater *Merops oreobates*		*	1	2	1		1				5	6500-9500
524	Hoopoe *Upupa epops*	1		*								1	6000-7500
525	White-headed Wood-hoopoe *Phoeniculus bollei*				*	1		3				4	7500-9500
530	Common Scimitarbill *Rhinopomastus cyanomelas*				1	*						1	7500-8500
543	Crowned Hornbill *Tockus alboterminatus*	1		*	1	*						2	6500-8500
549	Silvery-cheeked Hornbill *Bycanistes brevis*		*	2	2	*						4	6500-8500
560	Moustached Green Tinkerbird *Pogoniulus leucomystax*	1		*				1				2	6000-9500
563	Yellow-rumped Tinkerbird *Pogoniulus bilineatus*			8	2	1	1					12	7000-9000
606	Fine-banded Woodpecker *Campethera tullbergi*				2		*					2	7500-9000
610	Cardinal Woodpecker *Dendropicos fuscescens*			*	1							1	7000-8000
651	Plain Martin *Riparia paludicola*			1			6	3	1			11	7000-10000
652	Sand Martin *Riparia riparia*					1						1	8000-8500
660	Barn Swallow *Hirundo rustica*				1	1	*					2	7500-8500
669	Common House Martin *Delichon urbica*				2							2	7500-8000
672	Black Saw-wing *Psalidoprocne holomelas*	4	*	11	6	8	7	4				40	6000-9500
*673	African Pied Wagtail *Motacilla aguimp*			*								*	7000-7500
676	Mountain Wagtail *Motacilla clara*			1								1	7000-7500
678	Yellow Wagtail *Motacilla flava*	1	*	*								1	6000-7500
*681	Grassland Pipit *Anthus cinnamomeus*					*						*	8000-8500
689	Tree Pipit *Anthus trivialis*			2				1				3	7000-9500
702	Yellow-whiskered Greenbul *Andropadus latirostris*			16	5							21	7000-8000

Table 20. (continued).

Elevation (feet)		6000-6500	6501-7000	7001-7500	7501-8000	8001-8500	8501-9000	9001-9500	9501-10000	10001-10500	10501-11000	Total	Elevation range (feet)
Species number	Species												
703	Slender-billed Greenbul *Andropadus gracilirostris*			1	1	*						2	7000-8500
705	Mountain Greenbul *Andropadus nigriceps*			9	4	3		1			1	18	7000-11000
713	Cabanis's Greenbul *Phyllastrephus cabanisi*			4	4							8	7000-8000
729	Common Bulbul *Pycnonotus barbatus*	6	*	5	3	9	7	3	1			34	6000-10000
737	African Hill Babbler *Pseudoalcippe abyssinica*			7	1	2		1				11	7000-9500
756	White-starred Robin *Pogonocichla stellata*			3	1	3	2			1		10	7000-10500
769	Cape Robin-Chat *Cossypha caffra*	2	*	*	2	2	*					6	6000-9000
771	Ruppell's Robin-Chat *Cossypha semirufa*			2	1							3	7000-8000
778	Brown-chested Alethe *Alethe poliocephala*			1								1	7000-7500
794	Common Stonechat *Saxicola torquata*			*	*	1	1					2	7000-9000
806	Alpine Chat *Cercomela sordida*						*		1	1		2	9000-10500
807	Northern Anteater Chat *Myrmecocichla aethiops*	1										1	6000-6500
814	Little Rock Thrush *Monticola rufocinereus*		*		1							1	7500-8000
816	Olive Thrush *Turdus olivaceus*	1		2	1	2	12	2	2	1		23	6000-10500
826	Abyssinian Ground Thrush *Zoothera piaggiae*							2				2	9000-9500
831	African Dusky Flycatcher *Muscicapa adusta*		*	12	4	5	1	7	3			32	6500-10000
840	White-eyed Slaty Flycatcher *Melaenornis fischeri*	4		7	5	6	1	1				24	6000-9500
*850	Lead-coloured Flycatcher *Myioparus plumbeus*		*									*	6500-7000
870	Blackcap *Sylvia atricapilla*	1		4	1	2						8	6000-8500
873	Willow Warbler *Phylloscopus trochilus*			5	2	3		1				11	7000-9500
876	Brown Woodland Warbler *Phylloscopus umbrovirens*			8	6	10	4	14	2	2	1	47	7000-11000

Table 20. (continued).

Elevation (feet)		6000-6500	6501-7000	7001-7500	7501-8000	8001-8500	8501-9000	9001-9500	9501-10000	10001-10500	10501-11000	Total	Elevation range (feet)
Species number	Species												
884	Cinnamon Bracken Warbler *Bradypterus cinnamomeus*	2		1	2	7	3	4	7	1		27	6000-10500
*891	Dark-capped Yellow Warbler *Chloropeta natalensis*					*						*	8000-8500
892	Mountain Yellow Warbler *Chloropeta similis*			1	1	2	4	4	2			14	7000-10000
893	Singing Cisticola *Cisticola cantans*			1								1	7000-7500
898	Hunter's Cisticola *Cisticola hunteri*	4	*	10	19	16	11	24	13	2	1	100	6000-11000
910	Aberdare Cisticola *Cisticola aberdare*								1			1	9500-10000
933	Grey-backed Camaroptera *Camaroptera brachyura*	1	*	*								1	6000-7500
936	Yellow-breasted Apalis *Apalis flavida*	1		*	2	1						4	6000-8500
940	Chestnut-throated Apalis *Apalis porphyrolaema*		*	25	26	17	10	18	3	1		100	6500-10500
945	Grey Apalis *Apalis cinerea*			19	19	3	1	2				44	7000-9500
948	Black-throated Apalis *Apalis jacksoni*			1	1							2	7000-8000
*950	Black-collared Apalis *Apalis pulchra*			*	*							*	7000-8000
967	White-browed Crombec *Sylvietta leucophrys*				1							1	7500-8000
982	Montane White-eye *Zosterops poliogaster*			15	11	10	4	5	3	2		50	7000-10500
983	Yellow White-eye *Zosterops senegalensis*			2	1		1					4	7000-9000
990	White-bellied Tit *Parus albiventris*	1	*	4	5	1						11	6000-8500
1002	White-tailed Crested Flycatcher *Trochocercus albonotatus*		1	3	1							5	7000-8500
1007	African Paradise Flycatcher *Terpsiphone viridis*			3	1	1						5	7000-8500
1013	Chin-spot Batis *Batis molitor*			2		1			2			5	7000-10000
1032	Red-backed Shrike *Lanius collurio*			*			1					1	7000-9000
1043	Common Fiscal *Lanius collaris*	1				*	1	*		1		3	6000-10500
1048	Brown-crowned Tchagra *Tchagra australis*	2		1								3	6000-7500

Table 20. (continued).

Elevation (feet)		6000-6500	6501-7000	7001-7500	7501-8000	8001-8500	8501-9000	9001-9500	9501-10000	10001-10500	10501-11000	Total	Elevation range (feet)
Species number	Species												
1053	Black-fronted Bush-shrike *Malaconotu nigrifrons*			3								3	7000-7500
1064	Tropical Boubou *Laniarius aethiopicus*	3	*	7	18	15	4	4	2	2		55	6000-10500
1072	Black-backed Puffback *Dryoscopus cubla*			1	1							2	7000-8000
1076	Black Cuckoo-shrike *Campephaga flava*			1								1	7000-7500
1080	Grey Cuckoo-shrike *Coracina caesia*			3	2	*		2				7	7000-9500
1088	Montane Oriole *Oriolus percivali*	4		11	9			1				25	6000-9500
*1095	Pied Crow *Corvus albus*								*			*	9500-10000
*1098	Cape Rook *Corvus capensis*								*			*	9500-10000
1111	Greater Blue-eared Starling *Lamprotornis chalybaeus*				*	1						1	7500-8500
1140	Collared Sunbird *Anthreptes collaris*	1										1	6000-6500
1143	Olive Sunbird *Nectarinia olivacea*			5	2	*						7	7000-8500
*1149	Amythyst Sunbird *Nectarinia amethystina*						*					*	8500-9000
1152	Variable Sunbird *Nectarinia venusta*	1										1	6000-6500
1159	Northern Double-collared Sunbird *Nectarinia preussi*			2	1							3	7000-8000
1161	Eastern Double-collared Sunbird *Nectarinia mediocris*			2	1	3	1	4	1	2		14	7000-10500
1177	Tacazze Sunbird *Nectarinia tacazze*				*			2	2	1		5	9000-10500
1179	Bronze Sunbird *Nectarinia kilimensis*					1						1	8000-8500
1180	Golden-winged Sunbird *Nectarinia reichenowi*	1		2	1	1	1	4		2	1	13	6000-11000
1181	Malachite Sunbird *Nectarinia famosa*	1					1					2	6000-9000
1205	Baglafecht Weaver *Ploceus baglafecht*	3		1	2	1	1	1	2			11	6000-10000
1210	Spectacled Weaver *Ploceus ocularis*	1	*	3	1							5	6000-8000
1240	Brown-capped Weaver *Ploceus insignis*			3	1	*						4	7000-8500
*1258	Yellow Bishop *Euplectes capensis*					*						*	8000-8500
1269	Grey-headed Negrofinch *Nigrita canicapilla*		*	1		1		1	1			4	6500-10000

Table 20. (continued).

Elevation (feet)		6000-6500	6501-7000	7001-7500	7501-8000	8001-8500	8501-9000	9001-9500	9501-10000	10001-10500	10501-11000	Total	Elevation range (feet)
Species number	Species												
1279	Abyssinian Crimsonwing *Cryptospiza salvadorii*			1		*						1	7000-8500
1299	Yellow-bellied Waxbill *Estrilda quartinia*	1		4	4	1						10	6000-8500
*1303	Common Waxbill *Estrilda astrild*			*		*						*	7000-8500
1305	Black-headed Waxbill *Estrilda atricapilla*			1	*	*	1					2	7000-9000
1311	Purple Grenadier *Uraeginthus ianthinogaster*					2						2	8000-8500
1318	Bronze Mannikin *Lonchura cucullata*			1		1						2	7000-8500
1319	Black-and-white Mannikin *Lonchura bicolor*			1	*							1	7000-8000
1332	Yellow-crowned Canary *Serinus canicollis*				*	1	1	2		1		5	8000-10500
1333	African Citril *Serinus citrinelloides*				1	*						1	7500-8500
1343	Streaky Seedeater *Serinus striolatus*	2		4	4	3	7	6	6	2	1	35	6000-11000
1344	Thick-billed Canary *Serinus burtoni*		*	3	1	*	*					4	6500-9000
Total species on censuses		40		66	67	60	38	45	34	17	5	121	6000-11000
Total birds on censuses		74		296	256	218	126	180	72	25	5	1252	6000-11000
Number of transects		8		29	40	28	8	24	16	4	1	158	6000-11000
Number of species on and off censuses		40	29	89	89	83	51	49	39	18	6	148	6000-11000

* Species not seen during censuses.

Table 21. Summary of data on species of birds present along each of eight phases of the proposed wildlife fence around the Aberdares ecosystem, Kenya (1997-98). Data obtained from 158 15-minute censuses along transects and opportunistic observations during about 100 days of field work. The number of censuses on which each species was found in each phase is given. All common and scientific names according to EANHS (1996).

Species number	Species	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	No. Phases present
37	Cattle Egret *Bubulcus ibis*	1								1
*52	Hamerkop *Scopus umbretta*	*								1
62	Hadada Ibis *Bostrychia hagedash*	1		2		2		7	1	5
63	African Green Ibis *Bostrychia olivacea*							1		1
79	African Black Duck *Anas sparsa*	*					1			2
85	Yellow-billed Duck *Anas undulata*							1		1
*98	Eurasian Honey Buzzard *Pernis apivorus*		*			*				2
*100	Black-shouldered Kite *Elanus caeruleus*		*			*				2
117	African Harrier Hawk *Polyboroides typus*	1			*		*			3
125	African Goshawk *Accipiter tachiro*							2		1
134	Great Sparrowhawk *Accipiter melanoleucus*					1				1
139	Mountain Buzzard *Buteo oreophilus*	2		1		2		7	3	5
142	Augur Buzzard *Buteo augur*	1	2	2				4		4
155	Long-crested Eagle *Lophaetus occipitalis*	1	2					1	1	4
157	African Crowned Eagle *Stephanoaetus coronatus*				*			2		2
*158	Martial Eagle *Polemaetus bellicosus*				*			*		2
173	Greater Kestrel *Falco rupicoloides*		1							1
195	Scaly Francolin *Francolinus squamatus*		1		1					2
196	Jackson's Francolin *Francolinus jacksoni*		1		2			2		3
*199	Yellow-necked Spurfowl *Francolinus leucoscepus*	*								1
*312	Green Sandpiper *Tringa ochropus*	*					*			2
354	African Green Pigeon *Treron calva*	1								1

Table 21. (continued).

Species number	Species	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	No.phases present
357	Tambourine Dove *Turtur tympanistria*	2			3					2
358	Blue-spotted Wood Dove *Turtur afer*						1			1
*364	Eastern Bronze-naped Pigeon *Columba delegorguei*	*				*				2
365	Olive Pigeon *Columba arquatrix*	1	7	7	2	3				5
366	Speckled Pigeon *Columba guinea*			2						1
*369	Lemon Dove *Aplopelia larvata*	*								1
370	Red-eyed Dove *Streptopelia semitorquata*	7	14	2	1	5	1			6
373	Ring-necked Dove *Streptopelia capicola*	6	11	4						3
376	Dusky Turtle Dove *Streptopelia lugens*			2				8	4	3
377	Laughing Dove *Streptopelia senegalensis*							1	1	2
380	Red-fronted Parrot *Poicephalus gulielmi*	4	7	5	1		4	2		6
398	Hartlaub's Turaco *Tauraco hartlaubi*	6	11	7	11	13	9	13	3	8
409	Red-chested Cuckoo *Cuculus solitarius*	*			*	1				3
*420	Diederik Cuckoo *Chrysococcyx caprius*					*				1
422	White-browed Coucal *Centropus superciliosus*	3			3	1	1	1		5
*436	Spotted Eagle-Owl *Bubo africanus*		*							1
*444	African Wood Owl *Strix woodfordii*	*					*			2
*449	Montane Nightjar *Caprimulgus poliocephalus*	*	*	*	*					4
*457	Eurasian Nightjar *Caprimulgus europaeus*		*		*					2
468	Scarce Swift *Schoutedenapus myoptilus*					1		1		2
*471	African Black swift *Apus barbatus*				*					1
*475	Mottled Swift *Apus aequatorialis*		*							1
*476	Alpine Swift *Apus melba*		*		*					2
480	Speckled Mousebird *Colius striatus*	2		1				1		3
484	Narina Trogon *Apaloderma narina*							10	1	2

Table 21. (continued).

Species number	Species	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	No.phases present
485	Bar-tailed Trogon *Apaloderma vittatum*							1		1
*499	Giant Kingfisher *Megaceryle maxima*			*						1
514	Cinnamon-chested Bee-eater *Merops oreobates*	1		1		1		2		4
524	Hoopoe *Upupa epops*	1	*							2
525	White-headed Wood-hoopoe *Phoeniculus bollei*		3			*		1		3
530	Common Scimitarbill *Rhinopomastus cyanomelas*	1								1
543	Crowned Hornbill *Tockus alboterminatus*	1			*	1				3
549	Silvery-cheeked Hornbill *Bycanistes brevis*	1			2		1			3
560	Moustached Green Tinkerbird *Pogoniulus leucomystax*	1		1						2
563	Yellow-rumped Tinkerbird *Pogoniulus bilineatus*		1		4	1	4	1	1	6
606	Fine-banded Woodpecker *Campethera tullbergi*			*			2			2
610	Cardinal Woodpecker *Dendropicos fuscescens*	*				1				2
651	Plain Martin *Riparia paludicola*	1	5					5		3
652	Sand Martin *Riparia riparia*							1		1
660	Barn Swallow *Hirundo rustica*		1	1						2
669	Common House Martin *Delichon urbica*		1	1						2
672	Black Saw-wing *Psalidoprocne holomelas*	8	9	3	6	2	3	8	1	8
*673	African Pied Wagtail *Motacilla aguimp*						*			1
676	Mountain Wagtail *Motacilla clara*	1								1
678	Yellow Wagtail *Motacilla flava*	1								1
*681	Grassland Pipit *Anthus cinnamomeus*		*							1
689	Tree Pipit *Anthus trivialis*			1	2					2

Table 21. (continued).

Species number	Species	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	No.phases present
702	Yellow-whiskered Greenbul *Andropadus latirostris*	1			7	6	7			4
703	Slender-billed Greenbul *Andropadus gracilirostris*			*	1		1			3
705	Mountain Greenbul *Andropadus nigriceps*	3			4	3	3	5		5
713	Cabanis's Greenbul *Phyllastrephus cabanisi*				2	1	5			3
729	Common Bulbul *Pycnonotus barbatus*	9	9	3	4			6	3	6
737	African Hill Babbler *Pseudoalcippe abyssinica*	1			3		4	3		4
756	White-starred Robin *Pogonocichla stellata*	1			2	2		3	2	5
769	Cape Robin-Chat *Cossypha caffra*	2	1	1		2		*		5
771	Ruppell's Robin-Chat *Cossypha semirufa*				2		1			2
778	Brown-chested Alethe *Alethe poliocephala*						1			1
794	Common Stonechat *Saxicola torquata*		1	1		*				3
806	Alpine Chat *Cercomela sordida*		*		1		1			3
807	Northern Anteater Chat *Myrmecocichla aethiops*	1								1
814	Little Rock Thrush *Monticola rufocinereus*			1						1
816	Olive Thrush *Turdus olivaceus*	2	3	5	1	1		11		6
826	Abyssinian Ground Thrush *Zoothera piaggiae*			2						1
831	African Dusky Flycatcher *Muscicapa adusta*	2	4	3	5	6	2	9	1	8
840	White-eyed Slaty Flycatcher *Melaenornis fischeri*	6	5		5	3	1	2	2	7
*850	Lead-coloured Flycatcher *Myioparus plumbeus*	*								1
870	Blackcap *Sylvia atricapilla*	2	1	1	3	1				5
873	Willow Warbler *Phylloscopus trochilus*			2	3	3	1	2		5

Table 21. (continued).

Species number	Species	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	No.phases present
876	Brown Woodland Warbler *Phylloscopus umbrovirens*		2	9	4	7	5	18	2	7
884	Cinnamon Bracken Warbler *Bradypterus cinnamomeus*	2			1	1	1	19	3	6
*891	Dark-capped Yellow Warbler *Chloropeta natalensis*			*						1
892	Mountain Yellow Warbler *Chloropeta similis*	1		2	1		1	7	2	6
893	Singing Cisticola *Cisticola cantans*				1					1
898	Hunter's Cisticola *Cisticola hunteri*	7	14	12	10	15	2	37	4	8
910	Aberdare Cisticola *Cisticola aberdare*				1					1
933	Grey-backed Camaroptera *Camaroptera brachyura*	1								1
936	Yellow-breasted Apalis *Apalis flavida*	3	1							2
940	Chestnut-throated Apalis *Apalis porphyrolaema*	7	10	13	9	17	14	22	7	8
945	Grey Apalis *Apalis cinerea*	2	3	3	8	11	13	4		7
948	Black-throated Apalis *Apalis jacksoni*				1	1				2
*950	Black-collared Apalis *Apalis pulchra*						*			1
967	White-browed Crombec *Sylvietta leucophrys*						1			1
982	Montane White-eye *Zosterops poliogaster*	3	1	3	6	8	9	18	2	8
983	Yellow White-eye *Zosterops senegalensis*	2			1	1				3
990	White-bellied Tit *Parus albiventris*	1	1		3	2	4			5
1002	White-tailed Crested Flycatcher *Trochocercus albonotatus*				1		3	1		3
1007	African Paradise Flycatcher *Terpsiphone viridis*	1	1		2	1				4
1013	Chin-spot Batis *Batis molitor*				1	1		2	1	4
1032	Red-backed Shrike *Lanius collurio*					1	*			2

Table 21. (continued).

Species number	Species	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	No.phases present
1043	Common Fiscal *Lanius collaris*	1		1				1		3
1048	Brown-crowned Tchagra *Tchagra australis*	3								1
1053	Black-fronted Bush-Shrike *Malaconotus nigrifrons*				3					1
1064	Tropical Boubou *Laniarius aethiopicus*	7	4	4	3	6	7	19	5	8
1072	Black-backed Puffback *Dryoscopus cubla*	1			1					2
1076	Black Cuckoo-shrike *Campephaga flava*	1								1
1080	Grey Cuckoo-shrike *Coracina caesia*		1	1	3		1	1		5
1088	Montane Oriole *Oriolus percivali*	4		1	5	7	7	1		6
*1095	Pied Crow *Corvus albus*							*		1
*1098	Cape Rook *Corvus capensis*							*		1
1111	Greater Blue-eared Starling *Lamprotornis chalybaeus*		1							1
1140	Collared Sunbird *Anthreptes collaris*	1								1
1143	Olive Sunbird *Nectarinia olivacea*				2	3	2	*		4
*1149	Amethyst Sunbird *Nectarinia amethystina*		*							1
1152	Variable Sunbird *Nectarinia venusta*	1								1
1159	Northern Double-collared Sunbird *Nectarinia preussi*				2			1		2
1161	Eastern Double-collared Sunbird *Nectarinia mediocris*	2	1	2	1			8		5
1177	Tacazze Sunbird *Nectarinia tacazze*							5		1
1179	Bronze Sunbird *Nectarinia kilimensis*			1						1
1180	Golden-winged Sunbird *Nectarinia reichenowi*	3		1	1			8		4
1181	Malachite Sunbird *Nectarinia famosa*		1					1		2
1205	Baglafecht Weaver *Ploceus baglafecht*	3	2	1	1	2		2		6

Table 21. (continued).

Species number	Species	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	No. phases present
1210	Spectacled Weaver *Ploceus ocularis*	1			3	1				3
1240	Brown-capped Weaver *Ploceus insignis*	1			1	1	1			4
*1258	Yellow Bishop *Euplectes capensis*			*						1
1269	Grey-headed Negrofinch *Nigrita canicapilla*	*			1			3		3
1279	Abyssinian Crimsonwing *Cryptospiza salvadorii*	1					*			2
1299	Yellow-bellied Waxbill *Estrilda quartinia*	2	2	1		2	2	1		6
*1303	Common Waxbill *Estrilda astrild*	*		*					*	3
1305	Black-headed Waxbill *Estrilda atricapilla*	1	1							2
1311	Purple Grenadier *Uraeginthus ianthinogaster*		2							1
1318	Bronze Mannikin *Lonchura cucullata*		1			1				2
1319	Black-and-white Mannikin *Lonchura bicolor*			*			1			2
1332	Yellow-crowned Canary *Serinus canicollis*							5		1
1333	African Citril *Serinus citrinelloides*			1						1
1343	Streaky Seedeater *Serinus striolatus*	2	5	4	5	2		16	1	7
1344	Thick-billed Canary *Serinus burtoni*	1	*		2		1			4
Number of species on censuses		65	42	43	57	45	39	56	21	121
Total birds on censuses		151	155	122	166	154	129	325	50	1252
Number of transects		17	16	17	18	19	14	50	7	158
Number of species on and off censuses		76	54	52	66	51	46	61	22	148

* Species not seen during censuses and / or observed in this phase but not during censuses.

Table 22. Species of birds with wide ranges and with restricted ranges around the perimeter of the Aberdares ecosystem, Kenya (1997-98). Species found along only one or two phases of the proposed wildlife fence around the Aberdares are considered "restricted species", while those found along seven or eight phases are considered "wide range" species. Data obtained from 158 15-minute censuses along transects and opportunistic observations during about 100 days of field work. All common and scientific names according to EANHS (1996).

Bird species found in one phase only.

Phase	Species number	Species
1	37	Cattle Egret *Bubulcus ibis*
	*52	Hamerkop *Scopus umbretta*
	*199	Yellow-necked Spurfowl *Francolinus leucoscepus*
	354	African Green Pigeon *Treron calva*
	*369	Lemon Dove *Aplopelia larvata*
	530	Common Scimitarbill *Rhinopomastus cyanomelas*
	676	Mountain Wagtail *Motacilla clara*
	678	Yellow Wagtail *Motacilla flava*
	807	Northern Anteater Chat *Myrmecocichla aethiops*
	*850	Lead-coloured Flycatcher *Myioparus plumbeus*
	1048	Brown-crowned Tchagra *Tchagra australis*
	1140	Collared Sunbird *Anthreptes collaris*
	1152	Variable Sunbird *Nectarinia venusta*
2	173	Greater Kestrel *Falco rupicoloides*
	*436	Spotted Eagle-Owl *Bubo africanus*
	*475	Mottled Swift *Apus aequatorialis*
	*681	Grassland Pipit *Anthus cinnamomeus*
	1111	Greater Blue-eared Starling *Lamprotornis chalybaeus*
	*1149	Amethyst Sunbird *Nectarinia amethystina*
	1311	Purple Grenadier *Uraeginthus ianthinogaster*
3	366	Speckled Pigeon *Columba guinea*
	*499	Giant Kingfisher *Megaceryle maxima*
	814	Little Rock Thrush *Monticola rufocinereus*
	826	Abyssinian Ground Thrush *Zoothera piaggiae*
	*891	Dark-capped Yellow Warbler *Chloropeta natalensis*

Table 22. (continued) Bird species found in one phase only .

Phase	Species number	Species
3	1179	Bronze Sunbird *Nectarinia kilimensis*
	*1258	Yellow Bishop *Euplectes capensis*
4	*471	African Black Swift *Apus barbatus*
	893	Singing Cisticola *Cisticola cantans*
	910	Aberdare Cisticola *Cisticola aberdare*
	1053	Black-fronted Bush-Shrike *Malaconotus nigrifrons*
5	*420	Diederik Cuckoo *Chrysococcyx caprius*
6	358	Blue-spotted Wood Dove *Turtur afer*
	*673	African Pied Wagtail *Motacilla aguimp*
	778	Brown-chested Alethe *Alethe poliocephala*
	*950	Black-collared Apalis *Apalis pulchra*
	967	White-browed Crombec *Sylvietta leucophrys*
7	63	African Green Ibis *Bostrychia olivacea*
	85	Yellow-billed Duck *Anas undulata*
	125	African Goshawk *Accipiter tachiro*
	652	Sand Martin *Riparia riparia*
	*1095	Pied Crow *Corvus albus*
	*1098	Cape Rook *Corvus capensis*

Table 22. (continued) Bird species found in two phases only.

Phase	Species number	Species
1	*79	African Black Duck *Anas sparsa*
	134	Great Sparrowhawk *Accipiter melanoleucus*
	*312	Green Sandpiper *Tringa ochropus*
	*364	Eastern Bronze-naped Pigeon *Columba delegorguei*
	524	Hoopoe *Upupa epops*
	*610	Cardinal Woodpecker *Dendropicos fuscescens*
	936	Yellow-breasted Apalis *Apalis flavida*
	1072	Black-backed Puffback *Dryoscopus cubla*
	1076	Black Cuckoo-shrike *Campephaga flava*
	1279	Abyssinian Crimsonwing *Cryptospiza salvadorii*
	1332	Yellow-crowned Canary *Serinus canicollis*
2	*98	Eurasian Honey Buzzard *Pernis apivorus*
	*100	Black-shouldered Kite *Elanus caeruleus*
	195	Scaly Francolin *Francolinus squamatus*
	*457	Eurasian Nightjar *Caprimulgus europaeus*
	*476	Alpine Swift *Apus melba*
	*524	Hoopoe *Upupa epops*
	660	Barn Swallow *Hirundo rustica*
	669	Common House Martin *Delichon urbica*
	936	Yellow-breasted Apalis *Apalis flavida*
	1181	Malachite Sunbird *Nectarinia famosa*
3	660	Barn Swallow *Hirundo rustica*
	669	Common House Martin *Delichon urbica*
	689	Tree Pipit *Anthus trivialis*
	*1319	Black-and-white Mannikin *Lonchura bicolor*
	1333	African Citril *Serinus citrinelloides*
4	*157	African Crowned Eagle *Stephanoaetus coronatus*
	*158	Martial Eagle *Polemaetus bellicosus*
	195	Scaly Francolin *Francolinus squamatus*
	*457	Eurasian Nightjar *Caprimulgus europaeus*
	*476	Alpine Swift *Apus melba*
	689	Tree Pipit *Anthus trivialis*
	933	Grey-backed Camaroptera *Camaroptera brachyura*
	948	Black-throated Apalis *Apalis jacksoni*

Table 22. (continued) Bird species found in two phases only.

Phase	Species number	Species
4	1072	Black-backed Puffback *Dryoscopus cubla*
	1159	Northern Double-collared Sunbird *Nectarinia preussi*
	1177	Tacazze Sunbird *Nectarinia tacazze*
5	*98	Eurasian Honey Buzzard *Pernis apivorus*
	*100	Black-shouldered Kite *Elanus caeruleus*
	134	Great Sparrowhawk *Accipiter melanoleucus*
	*364	Eastern Bronze-naped Pigeon *Columba delegorguei*
	468	Scarce Swift *Schoutedenapus myoptilus*
	485	Bar-tailed Trogon *Apaloderma vittatum*
	610	Cardinal Woodpecker *Dendropicos fuscescens*
	948	Black-throated Apalis *Apalis jacksoni*
	1032	Red-backed Shrike *Lanius collurio*
6	79	African Black Duck *Anas sparsa*
	*312	Green Sandpiper *Tringa ochropus*
	933	Grey-backed Camaroptera *Camaroptera brachyura*
	*1032	Red-backed Shrike *Lanius collurio*
	1076	Black Cuckoo-shrike *Campephaga flava*
	*1279	Abyssinian Crimsonwing *Cryptospiza salvadorii*
	1319	Black-and-white Mannikin *Lonchura bicolor*
7	157	African Crowned Eagle *Stephanoaetus coronatus*
	*158	Martial Eagle *Polemaetus bellicosus*
	377	Laughing Dove *Streptopelia senegalensis*
	468	Scarce Swift *Schoutedenapus myoptilus*
	484	Narina Trogon *Apaloderma narina*
	485	Bar-tailed Trogon *Apaloderma vittatum*
	1159	Northern Double-collared Sunbird *Nectarinia preussi*
	1177	Tacazze Sunbird *Nectarinia tacazze*
	1181	Malachite Sunbird *Nectarinia famosa*
	1332	Yellow-crowned Canary *Serinus canicollis*
	1333	African Citril *Serinus citrinelloides*
8	377	Laughing Dove *Streptopelia senegalensis*
	484	Narina Trogon *Apaloderma narina*

Table 22. (continued) Bird species found in all eight phases.

Species number	Species
398	Hartlaub's Turaco *Tauraco hartlaubi*
672	Black Saw-wing *Psalidoprocne holomelas*
831	African Dusky Flycatcher *Muscicapa adusta*
840	White-eyed Slaty Flycatcher *Melaenornis fischeri*
876	Brown Woodland Warbler *Phylloscopus umbrovirens*
898	Hunter's Cisticola *Cisticola hunteri*
940	Chestnut-throated Apalis *Apalis porphyrolaema*
982	Montane White-eye *Zosterops poliogaster*
1064	Tropical Boubou *Laniarius aethiopicus*

Bird species found in seven phases.

Species number	Species
62	Hadada Ibis *Bostrychia hagedash*
370	Red-eyed Dove *Streptopelia semitorquata*
563	Yellow-rumped Tinkerbird *Pogoniulus bilineatus*
729	Common Bulbul *Pycnonotus barbatus*
816	Olive Thrush *Turdus olivaceus*
945	Grey Apalis *Apalis cinerea*
1299	Yellow-bellied Waxbill *Estrilda quartinia*
1343	Streaky Seedeater *Serinus striolatus*

* Species not found during censuses.

Table 23. Summary of results of 158 15-minute bird censuses in the Aberdares ecosystem, Kenya (1997-98). All common and scientific names according to EANHS (1996). See Table 17 and Map 19.

	Phase number	1	4	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Elevation in feet (× 1000)	7.5	7.5	7.5	7.5	7.5	7.5	7.6	6.4	6.4	6.4	6.4	6.5	6.5	6.5	6.5	7.7	7.6	7.6	7.3	7.4
	Transect	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Species number	Species																				
37	Cattle Egret *Bubulcus ibis*										X										
62	Hadada Ibis *Bostrychia hagedash*								X												
63	African Green Ibis *Bostrychia olivacea*																				
79	African Black Duck *Anas sparsa*																				
85	Yellow-billed Duck *Anas undulata*																				
117	African Harrier Hawk *Polyboroides typus*															X					
125	African Goshawk *Accipiter tachiro*																				
134	Great Sparrowhawk *Accipiter melanoleucus*																				
139	Mountain Buzzard *Buteo oreophilus*											X				X					
142	Augur Buzzard *Buteo augur*							X													
155	Long-crested Eagle *Lophaetus occipitalis*														X						
157	African Crowned Eagle *Stephanoaetus coronatus*																				
173	Greater Kestrel *Falco rupicoloides*																				
195	Scaly Francolin *Francolinus squamatus*																				
196	Jackson's Francolin *Francolinus jacksoni*																				
354	African Green Pigeon *Treron calva*										X										
357	Tambourine Dove *Turtur tympanistria*				X	X	X	X													
358	Blue-spotted Wood Dove *Turtur afer*																				
365	Olive Pigeon *Columba arquatrix*									X											
366	Speckled Pigeon *Columba guinea*																				
370	Red-eyed Dove *Streptopelia semitorquata*				X				X		X	X	X		X		X	X			
373	Ring-necked Dove *Streptopelia capicola*								X	X		X					X	X	X		
376	Dusky Turtle Dove *Streptopelia lugens*																				

	Transect number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Species number	Species																				
377	Laughing Dove *Streptopelia senegalensis*																				
380	Red-fronted Parrot *Poicephalus gulielmi*	X		X													X	X	X		
398	Hartlaub's Turaco *Tauraco hartlaubi*	X	X	X	X	X	X	X									X	X	X		
409	Red-chested Cuckoo *Cuculus solitarius*																				
422	White-browed Coucal *Centropus superciliosus*								X			X					X				
468	Scarce Swift *Schoutedenapus myoptilus*																				
480	Speckled Mousebird *Colius striatus*											X					X				
484	Narina Trogon *Apaloderma narina*																				
485	Bar-tailed Trogon *Apaloderma vittatum*																				
514	Cinnamon-chested Bee-eater *Merops oreobates*			X														X			
524	Hoopoe *Upupa epops*												X								
525	White-headed Wood-hoopoe *Phoeniculus bollei*																				
530	Common Scimitarbill *Rhinopomastus cyanomelas*																X				
543	Crowned Hornbill *Tockus alboterminatus*									X											
549	Silvery-cheeked Hornbill *Bycanistes brevis*			X													X				
560	Moustached Green Tinkerbird *Pogoniulus leucomystax*									X											
563	Yellow-rumped Tinkerbird *Pogoniulus bilineatus*				X																
606	Fine-banded Woodpecker *Campethera tullbergi*																				
610	Cardinal Woodpecker *Dendropicos fuscescens*																				
651	Plain Martin *Riparia paludicola*							X													
652	Sand Martin *Riparia riparia*																				

	Transect number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Species number	Species																				
660	Barn Swallow *Hirundo rustica*																				
669	Common House Martin *Delichon urbica*																				
672	Black Saw-wing *Psalidoprocne holomelas*		X	X	X	X	X	X					X	X	X	X			X	X	
676	Mountain Wagtail *Motacilla clara*					X															
678	Yellow Wagtail *Motacilla flava*													X							
689	Tree Pipit *Anthus trivialis*																				
702	Yellow-whiskered Greenbul *Andropadus latirostris*					X	X														
703	Slender-billed Greenbul *Andropadus gracilirostris*																				
705	Mountain Greenbul *Andropadus nigriceps*	X	X				X													X	
713	Cabanis's Greenbul *Phyllastrephus cabanisi*																				
729	Common Bulbul *Pycnonotus barbatus*		X		X			X	X	X		X	X	X	X		X			X	
737	African Hill Babbler *Pseudoalcippe abyssinica*				X															X	
756	White-starred Robin *Pogonocichla stellata*		X				X														
769	Cape Robin-Chat *Cossypha caffra*										X	X									
771	Ruppell's Robin-Chat *Cossypha semirufa*																				
778	Brown-chested Alethe *Alethe poliocephala*																				
794	Common Stonechat *Saxicola torquata*																				
806	Alpine Chat *Cercomela sordida*																				
807	Northern Anteater Chat *Myrmecocichla aethiops*													X							
814	Little Rock Thrush *Monticola rufocinereus*																				
816	Olive Thrush *Turdus olivaceus*	X								X											
826	Abyssinian Ground Thrush *Zoothera piaggiae*																				

	Transect number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Species number	Species																				
831	African Dusky Flycatcher *Muscicapa adusta*		X				X														X
840	White-eyed Slaty Flycatcher *Melaenornis fischeri*	X				X	X			X	X				X		X				
870	Blackcap *Sylvia atricapilla*			X	X		X						X								
873	Willow Warbler *Phylloscopus trochilus*																				
884	Cinnamon Bracken Warbler *Bradypterus cinnamomeus*													X	X						
876	Brown Woodland Warbler *Phylloscopus umbrovirens*		X																		
892	Mountain Yellow Warbler *Chloropeta similis*						X														
893	Singing Cisticola *Cisticola cantans*																				
898	Hunter's Cisticola *Cisticola hunteri*	X			X							X	X		X	X		X	X		
910	Aberdare Cisticola *Cisticola aberdare*																				
933	Grey-backed Camaroptera *Camaroptera brachyura*													X							
936	Yellow-breasted Apalis *Apalis flavida*														X			X	X		
940	Chestnut-throated Apalis *Apalis porphyrolaema*	X	X	X	X		X	X										X	X	X	
945	Grey Apalis *Apalis cinerea*		X	X																	X
948	Black-throated Apalis *Apalis jacksoni*																				
967	White-browed Crombec *Sylvietta leucophrys*																				
982	Montane White-eye *Zosterops poliogaster*		X		X		X										X			X	
983	Yellow White-eye *Zosterops senegalensis*					X															X
990	White-bellied Tit *Parus albiventris*								X												

	Transect number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Species number	Species																				
1002	White-tailed Crested Flycatcher *Trochocercus albonotatus*																				
1007	African Paradise Flycatcher *Terpsiphone viridis*					X															X
1013	Chin-spot Batis *Batis molitor*																				
1032	Red-backed Shrike *Lanius collurio*																				
1043	Common Fiscal *Lanius collaris*									X											
1048	Brown-crowned Tchagra *Tchagra australis*									X			X				X				
1053	Black-fronted Bush-Shrike *Malaconotus nigrifrons*																				
1064	Tropical Boubou *Laniarius aethiopicus*				X		X		X				X		X		X			X	
1072	Black-backed Puffback *Dryoscopus cubla*																	X			
1076	Black Cuckoo-shrike *Campephaga flava*																				
1080	Grey Cuckoo-shrike *Coracina caesia*																				
1088	Montane Oriole *Oriolus percivali*								X	X	X		X								
1111	Greater Blue-eared Starling *Lamprotornis chalybaeus*																				
1140	Collared Sunbird *Anthreptes collaris*										X										
1143	Olive Sunbird *Nectarinia olivacea*																				
1152	Variable Sunbird *Nectarinia venusta*													X							
1159	Northern Double-collared Sunbird *Nectarinia preussi*																				
1161	Eastern Double-collared Sunbird *Nectarinia mediocris*	X			X													X			
1177	Tacazze Sunbird *Nectarinia tacazze*																				
1179	Bronze Sunbird *Nectarinia kilimensis*																				
1180	Golden-winged Sunbird *Nectarinia reichenowi*				X								X				X		X		

	Transect number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Species number	Species																				
1181	Malachite Sunbird *Nectarinia famosa*																				
1205	Baglafecht Weaver *Ploceus baglafecht*									X			X	X							
1210	Spectacled Weaver *Ploceus ocularis*		X			X									X						
1240	Brown-capped Weaver *Ploceus insignis*																				X
1269	Grey-headed Negrofinch *Nigrita canicapilla*																				
1279	Abyssinian Crimsonwing *Cryptospiza salvadorii*																				X
1299	Yellow-bellied Waxbill *Estrilda quartinia*	X												X							
1305	Black-headed Waxbill *Estrilda atricapilla*	X																			
1311	Purple Grenadier *Uraeginthus ianthinogaster*																				
1318	Bronze Mannikin *Lonchura cucullata*																				
1319	Black-and-white Mannikin *Lonchura bicolor*																				
1332	Yellow-crowned Canary *Serinus canicollis*																				
1333	African Citril *Serinus citrinelloides*																				
1343	Streaky Seedeater *Serinus striolatus*				X								X		X						
1344	Thick-billed Canary *Serinus burtoni*				X																X
	Total species on census	10	11	8	16	9	13	7	9	10	7	8	12	9	11	4	14	10	8	7	7

Table 23. (continued) Transects 21-40.

	Phase number	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	2	2	3
	Elevation in feet (× 1000)	7.4	9.0	9.1	9.1	9.1	9.0	9.0	9.0	9.0	9.0	8.1	8.1	8.1	8.0	8.0	7.6	7.6	8.4	8.4	8.4
	Transect number	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Species number	Species																				
37	Cattle Egret B*ubulcus ibis*																				
62	Hadada Ibis *Bostrychia hagedash*																X				
63	African Green Ibis *Bostrychia olivacea*																				
79	African Black Duck *Anas sparsa*																				
85	Yellow-billed Duck *Anas undulata*																				
117	African Harrier Hawk *Polyboroides typus*																				
125	African Goshawk *Accipiter tachiro*																				
134	Great Sparrowhawk *Accipiter melanoleucus*																				
139	Mountain Buzzard *Buteo oreophilus*																				
142	Augur Buzzard *Buteo augur*									X				X							X
155	Long-crested Eagle *Lophaetus occipitalis*				X						X										
157	African Crowned Eagle *Stephanoaetus coronatus*																				
173	Greater Kestrel *Falco rupicoloides*											X									
195	Scaly Francolin *Francolinus squamatus*				X																
196	Jackson's Francolin *Francolinus jacksoni*				X																
354	African Green Pigeon *Treron calva*																				
357	Tambourine Dove *Turtur tympanistria*																				
358	Blue-spotted Wood Dove *Turtur afer*																				
365	Olive Pigeon *Columba arquatrix*			X	X	X	X	X	X										X		
366	Speckled Pigeon *Columba guinea*																				X
370	Red-eyed Dove *Streptopelia semitorquata*		X	X	X	X	X	X	X	X	X	X	X	X	X		X			X	X
373	Ring-necked Dove *Streptopelia capicola*		X	X			X		X	X	X	X	X	X			X	X	X		
376	Dusky Turtle Dove *Streptopelia lugens*																				X
377	Laughing Dove *Streptopelia senegalensis*																				
380	Red-fronted Parrot *Poicephalus gulielmi*		X	X	X	X	X	X					X				X				

	Transect number	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Species number	Species																				
398	Hartlaub's Turaco *Tauraco hartlaubi*		X	X	X	X	X		X			X		X		X		X	X	X	X
409	Red-chested Cuckoo *Cuculus solitarius*																				
422	White-browed Coucal *Centropus superciliosus*																				
468	Scarce Swift *Schoutedenapus myoptilus*																				
480	Speckled Mousebird *Colius striatus*																				
484	Narina Trogon *Apaloderma narina*																				
485	Bar-tailed Trogon *Apaloderma vittatum*																				
514	Cinnamon-chested Bee-eater *Merops oreobates*																				
524	Hoopoe *Upupa epops*																				
525	White-headed Wood-hoopoe *Phoeniculus bollei*																				
530	Common Scimitarbill *Rhinopomastus cyanomelas*																				
543	Crowned Hornbill *Tockus alboterminatus*																				
549	Silvery-cheeked Hornbill *Bycanistes brevis*																				
560	Moustached Green Tinkerbird *Pogoniulus leucomystax*																				
563	Yellow-rumped Tinkerbird *Pogoniulus bilineatus*														X						
606	Fine-banded Woodpecker *Campethera tullbergi*																				
610	Cardinal Woodpecker *Dendropicos fuscescens*																				
651	Plain Martin *Riparia paludicola*				X	X	X	X	X												
652	Sand Martin *Riparia riparia*																				
660	Barn Swallow *Hirundo rustica*																	X			X
669	Common House Martin *Delichon urbica*														X	X					
672	Black Saw-wing *Psalidoprocne holomelas*			X			X	X	X	X	X	X	X	X		X					
676	Mountain Wagtail *Motacilla clara*																				

	Transect number	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Species number	Species																				
678	Yellow Wagtail *Motacilla flava*																				
703	Slender-billed Greenbul *Andropadus gracilirostris*																				
705	Mountain Greenbul *Andropadus nigriceps*																				
713	Cabanis's Greenbul *Phyllastrephus cabanisi*																				
729	Common Bulbul *Pycnonotus barbatus*			X	X		X	X				X		X				X	X	X	X
737	African Hill Babbler *Pseudoalcippe abyssinica*																				
756	White-starred Robin *Pogonocichla stellata*																				
769	Cape Robin-Chat *Cossypha caffra*											X									X
771	Ruppell's Robin-Chat *Cossypha semirufa*																				
778	Brown-chested Alethe *Alethe poliocephala*																				
794	Common Stonechat *Saxicola torquata*									X											
807	Northern Anteater Chat *Myrmecocichla aethiops*																				
806	Alpine Chat *Cercomela sordida*																				
814	Little Rock Thrush *Monticola rufocinereus*															X					
816	Olive Thrush *Turdus olivaceus*					X	X	X													
826	Abyssinian Ground Thrush *Zoothera piaggiae*																				
831	African Dusky Flycatcher *Muscicapa adusta*					X					X			X	X						
840	White-eyed Slaty Flycatcher *Melaenornis fischeri*											X	X	X				X			
870	Blackcap *Sylvia atricapilla*															X			X		
873	Willow Warbler *Phylloscopus trochilus*																				
884	Cinnamon Bracken Warbler *Bradypterus cinnamomeus*																				

	Transect number	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Species number	Species																				
876	Brown Woodland Warbler *Phylloscopus umbrovirens*		X		X																
884	Cinnamon Bracken Warbler *Bradypterus cinnamomeus*																				
892	Mountain Yellow Warbler *Chloropeta similis*																				
893	Singing Cisticola *Cisticola cantans*																				
898	Hunter's Cisticola *Cisticola hunteri*		X	X	X	X	X	X	X	X	X	X	X	X	X	X			X		
910	Aberdare Cisticola *Cisticola aberdare*																				
933	Grey-backed Camaroptera *Camaroptera brachyura*																				
936	Yellow-breasted Apalis *Apalis flavida*																		X		
940	Chestnut-throated Apalis *Apalis porphyrolaema*	X				X	X	X	X						X				X	X	X
945	Grey Apalis *Apalis cinerea*	X				X					X		X		X	X					
948	Black-throated Apalis *Apalis jacksoni*																				
967	White-browed Crombec *Sylvietta leucophrys*																				
982	Montane White-eye *Zosterops poliogaster*																			X	
983	Yellow White-eye *Zosterops senegalensis*	X																			
990	White-bellied Tit *Parus albiventris*													X							
1002	White-tailed Crested Flycatcher *Trochocercus albonotatus*																				
1007	African Paradise Flycatcher *Terpsiphone viridis*												X								
1013	Chin-spot Batis *Batis molitor*																				
1032	Red-backed Shrike *Lanius collurio*																				
1043	Common Fiscal *Lanius collaris*																				
1048	Brown-crowned Tchagra *Tchagra australis*																				

	Transect number	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Species number	Species																				
1053	Black-fronted Bush-Shrike *Malaconotus nigrifrons*																				
1064	Tropical Boubou *Laniarius aethiopicus*		X									X	X	X	X	X			X		X
1072	Black-backed Puffback *Dryoscopus cubla*																				
1076	Black Cuckoo-shrike *Campephaga flava*	X																			
1080	Grey Cuckoo-shrike *Coracina caesia*														X						
1088	Montane Oriole *Oriolus percivali*																				
1111	Greater Blue-eared Starling *Lamprotornis chalybaeus*																		X		
1140	Collared Sunbird *Anthreptes collaris*																				
1143	Olive Sunbird *Nectarinia olivacea*																				
1152	Variable Sunbird *Nectarinia venusta*																				
1159	Northern Double-collared Sunbird *Nectarinia preussi*																				
1161	Eastern Double-collared Sunbird *Nectarinia mediocris*							X													
1177	Tacazze Sunbird *Nectarinia tacazze*																				
1179	Bronze Sunbird *Nectarinia kilimensis*																				
1180	Golden-winged Sunbird *Nectarinia reichenowi*																				
1181	Malachite Sunbird *Nectarinia famosa*										X										
1205	Baglafecht Weaver *Ploceus baglafecht*									X		X									
1210	Spectacled Weaver *Ploceus ocularis*																				
1240	Brown-capped Weaver *Ploceus insignis*																				
1269	Grey-headed Negrofinch *Nigrita canicapilla*																				
1279	Abyssinian Crimsonwing *Cryptospiza salvadorii*																				
1299	Yellow-bellied Waxbill *Estrilda quartinia*													X	X	X					
1305	Black-headed Waxbill *Estrilda atricapilla*						X														
1311	Purple Grenadier *Uraeginthus ianthinogaster*											X	X								

	Transect number	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Species number	Species																				
1318	Bronze Mannikin *Lonchura cucullata*												X								
1319	Black-and-white Mannikin *Lonchura bicolor*																				
1332	Yellow-crowned Canary *Serinus canicollis*																				
1333	African Citril *Serinus citrinelloides*															X					
1343	Streaky Seedeater *Serinus striolatus*						X	X		X	X			X		X					
1344	Thick-billed Canary *Serinus burtoni*																				
	Total species on census	4	8	8	11	9	13	11	8	8	9	12	11	13	10	11	4	5	10	5	10

Table 23. (continued) Transects 41-60.

	Phase number	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4
	Elevation in feet (× 1000)	8.4	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.9	9.9	9.9	9.9	7.4	7.4
	Transect number	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Species number	Species																				
37	Cattle Egret *Bubulcus ibis*																				
62	Hadada Ibis *Bostrychia hagedash*									X											
63	African Green Ibis *Bostrychia olivacea*																				
79	African Black Duck *Anas sparsa*																				
85	Yellow-billed Duck *Anas undulata*																				
117	African Harrier Hawk *Polyboroides typus*																				
125	African Goshawk *Accipiter tachiro*																				
134	Great Sparrowhawk *Accipiter melanoleucus*																				
139	Mountain Buzzard *Buteo oreophilus*													X							
142	Augur Buzzard *Buteo augur*	X																			
155	Long-crested Eagle *Lophaetus occipitalis*																				
157	African Crowned Eagle *Stephanoaetus coronatus*																				
173	Greater Kestrel *Falco rupicoloides*																				
195	Scaly Francolin *Francolinus squamatus*																X				
196	Jackson's Francolin *Francolinus jacksoni*															X	X				
354	African Green Pigeon *Treron calva*																				
357	Tambourine Dove *Turtur tympanistria*																				
358	Blue-spotted Wood Dove *Turtur afer*																				
365	Olive Pigeon *Columba arquatrix*	X	X					X	X		X	X	X				X	X			
366	Speckled Pigeon *Columba guinea*	X																			
370	Red-eyed Dove *Streptopelia semitorquata*																				
373	Ring-necked Dove *Streptopelia capicola*							X	X		X										
376	Dusky Turtle Dove *Streptopelia lugens*													X							
377	Laughing Dove *Streptopelia senegalensis*																				
380	Red-fronted Parrot *Poicephalus gulielmi*							X	X	X	X										
398	Hartlaub's Turaco *Tauraco hartlaubi*	X			X		X		X					X						X	X

Transect number		41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Species number	Species																				
409	Red-chested Cuckoo *Cuculus solitarius*																				
422	White-browed Coucal *Centropus superciliosus*																X				
468	Scarce Swift *Schoutedenapus myoptilus*																				
480	Speckled Mousebird *Colius striatus*	X																			
484	Narina Trogon *Apaloderma narina*																				
485	Bar-tailed Trogon *Apaloderma vittatum*																				
514	Cinnamon-chested Bee-eater *Merops oreobates*																				
524	Hoopoe *Upupa epops*																				
525	White-headed Wood-hoopoe *Phoeniculus bollei*		X	X		X															
530	Common Scimitarbill *Rhinopomastus cyanomelas*																				
543	Crowned Hornbill *Tockus alboterminatus*																				
549	Silvery-cheeked Hornbill *Bycanistes brevis*																				
560	Moustached Green Tinkerbird *Pogoniulus leucomystax*					X															
563	Yellow-rumped Tinkerbird *Pogoniulus bilineatus*																				
606	Fine-banded Woodpecker *Campethera tullbergi*																				
610	Cardinal Woodpecker *Dendropicos fuscescens*																				
651	Plain Martin *Riparia paludicola*																				
652	Sand Martin *Riparia riparia*																				
660	Barn Swallow *Hirundo rustica*																				
669	Common House Martin *Delichon urbica*																				
672	Black Saw-wing *Psalidoprocne holomelas*				X				X												
676	Mountain Wagtail *Motacilla clara*																				
678	Yellow Wagtail *Motacilla flava*																				
689	Tree Pipit *Anthus trivialis*				X																X

Transect number		41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Species number	Species																				
702	Yellow-whiskered Greenbul *Andropadus latirostris*																			X	X
703	Slender-billed Greenbul *Andropadus gracilirostris*																				
705	Mountain Greenbul *Andropadus nigriceps*																				
713	Cabanis's Greenbul *Phyllastrephus cabanisi*																			X	
729	Common Bulbul *Pycnonotus barbatus*	X													X				X		
737	African Hill Babbler *Pseudoalcippe abyssinica*																				
756	White-starred Robin *Pogonocichla stellata*																			X	
769	Cape Robin-Chat *Cossypha caffra*																				
771	Ruppell's Robin-Chat *Cossypha semirufa*																				
778	Brown-chested Alethe *Alethe poliocephala*																				
794	Common Stonechat *Saxicola torquata*	X																			
806	Alpine Chat *Cercomela sordida*																	X			
807	Northern Anteater Chat *Myrmecocichla aethiops*																				
814	Little Rock Thrush *Monticola rufocinereus*																				
816	Olive Thrush *Turdus olivaceus*			X				X			X	X	X						X		
826	Abyssinian Ground Thrush *Zoothera piaggiae*											X		X							
831	African Dusky Flycatcher *Muscicapa adusta*					X							X		X						
840	White-eyed Slaty Flycatcher *Melaenornis fischeri*										X										X
870	Blackcap *Sylvia atricapilla*																				
873	Willow Warbler *Phylloscopus trochilus*	X					X														
876	Brown Woodland Warbler *Phylloscopus umbrovirens*		X	X			X		X	X	X	X		X	X					X	
884	Cinnamon Bracken Warbler *Bradypterus cinnamomeus*																				

Species number	Species / Transect number	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
892	Mountain Yellow Warbler *Chloropeta similis*										X				X				X		
893	Singing Cisticola *Cisticola cantans*																				X
898	Hunter's Cisticola *Cisticola hunteri*		X		X	X	X		X	X	X	X	X	X	X	X	X	X	X		X
910	Aberdare Cisticola *Cisticola aberdare*																X				
933	Grey-backed Camaroptera *Camaroptera brachyura*																				
936	Yellow-breasted Apalis *Apalis flavida*																				
940	Chestnut-throated Apalis *Apalis porphyrolaema*		X		X	X	X	X	X	X	X	X	X	X	X					X	X
945	Grey Apalis *Apalis cinerea*						X			X										X	X
948	Black-throated Apalis *Apalis jacksoni*																				
967	White-browed Crombec *Sylvietta leucophrys*																				
982	Montane White-eye *Zosterops poliogaster*				X	X		X													
983	Yellow White-eye *Zosterops senegalensis*																				
990	White-bellied Tit *Parus albiventris*																				X
1002	White-tailed Crested Flycatcher *Trochocercus albonotatus*																			X	
1007	African Paradise Flycatcher *Terpsiphone viridis*																				
1013	Chin-spot Batis *Batis molitor*																				
1032	Red-backed Shrike *Lanius collurio*																				
1043	Common Fiscal *Lanius collaris*	X																			
1048	Brown-crowned Tchagra *Tchagra australis*																				
1053	Black-fronted Bush-Shrike *Malaconotus nigrifrons*																			X	
1064	Tropical Boubou *Laniarius aethiopicus*												X								
1072	Black-backed Puffback *Dryoscopus cubla*																				
1076	Black Cuckoo-shrike *Campephaga flava*																				
1080	Grey Cuckoo-shrike *Coracina caesia*		X																		X
1088	Montane Oriole *Oriolus percivali*										X									X	

Species number	Species / Transect number	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
1111	Greater Blue-eared Starling *Lamprotornis chalybaeus*																				
1140	Collared Sunbird *Anthreptes collaris*																				
1143	Olive Sunbird *Nectarinia olivacea*																				X
1152	Variable Sunbird *Nectarinia venusta*																				
1159	Northern Double-collared Sunbird *Nectarinia preussi*																				X
1161	Eastern Double-collared Sunbird *Nectarinia mediocris*					X						X									
1177	Tacazze Sunbird *Nectarinia tacazze*																				
1179	Bronze Sunbird *Nectarinia kilimensis*	X																			
1180	Golden-winged Sunbird *Nectarinia reichenowi*	X																			
1181	Malachite Sunbird *Nectarinia famosa*																				
1205	Baglafecht Weaver *Ploceus baglafecht*										X										
1210	Spectacled Weaver *Ploceus ocularis*																				
1240	Brown-capped Weaver *Ploceus insignis*																				
1269	Grey-headed Negrofinch *Nigrita canicapilla*																			X	
1279	Abyssinian Crimsonwing *Cryptospiza salvadorii*																				
1299	Yellow-bellied Waxbill *Estrilda quartinia*																				
1305	Black-headed Waxbill *Estrilda atricapilla*																				
1311	Purple Grenadier *Uraeginthus ianthinogaster*																				
1318	Bronze Mannikin *Lonchura cucullata*																				
1319	Black-and-white Mannikin *Lonchura bicolor*																				
1332	Yellow-crowned Canary *Serinus canicollis*																				
1333	African Citril *Serinus citrinelloides*																				
1343	Streaky Seedeater *Serinus striolatus*				X	X									X		X	X			
1344	Thick-billed Canary *Serinus burtoni*																				
	Total species on census	11	6	3	7	8	6	6	8	6	11	7	6	7	7	2	7	4	4	11	12

Table 3. (continued) Transects 61-80.

	Phase number	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5
	Elevation in feet (× 1000)	7.4	7.4	7.4	7.4	7.2	7.2	7.2	7.2	8.5	8.5	8.5	7.8	7.8	7.8	7.8	7.8	7.8	8.9	8.9	7.7
	Transect number	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Species number	Species																				
37	Cattle Egret *Bubulcus ibis*																				
62	Hadada Ibis *Bostrychia hagedash*																				
63	African Green Ibis *Bostrychia olivacea*																				
79	African Black Duck *Anas sparsa*																				
85	Yellow-billed Duck *Anas undulata*																				
117	African Harrier Hawk *Polyboroides typus*																				
125	African Goshhwk *Accipiter tachiro*																				
134	Great Sparrowhawk *Accipiter melanoleucus*																	X			
139	Mountain Buzzard *Buteo oreophilus*																				
142	Augur Buzzard *Buteo augur*																				
155	Long-crested Eagle *Lophaetus occipitalis*																				
157	African Crowned Eagle *Stephanoaetus coronatus*																				
173	Greater Kestrel *Falco rupicoloides*																				
195	Scaly Francolin *Francolinus squamatus*																				
196	Jackson's Francolin *Francolinus jacksoni*																				
354	African Green Pigeon *Treron calva*																				
357	Tambourine Dove *Turtur tympanistria*			X																	
358	Blue-spotted Wood Dove *Turtur afer*																				
365	Olive Pigeon *Columba arquatrix*														X		X				X
366	Speckled Pigeon *Columba guinea*																				
370	Red-eyed Dove *Streptopelia semitorquata*														X		X				X
373	Ring-necked Dove *Streptopelia capicola*																				
376	Dusky Turtle Dove *Streptopelia lugens*																				
377	Laughing Dove *Streptopelia senegalensis*																				
380	Red-fronted Parrot *Poicephalus gulielmi*																				
398	Hartlaub's Turaco *Tauraco hartlaubi*		X	X	X	X			X	X	X	X		X		X	X	X			X

Transect number		61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Species number	Species																				
409	Red-chested Cuckoo *Cuculus solitarius*																				
422	White-browed Coucal *Centropus superciliosus*					X			X				X								
468	Scarce Swift *Schoutedenapus myoptilus*																X				
480	Speckled Mousebird *Colius striatus*																				
484	Narina Trogon *Apaloderma narina*																				
485	Bar-tailed Trogon *Apaloderma vittatum*																				
514	Cinnamon-chested Bee-eater *Merops oreobates*																	X			
524	Hoopoe *Upupa epops*																				
525	White-headed Wood-hoopoe *Phoeniculus bollei*																				
530	Common Scimitarbill *Rhinopomastus cyanomelas*																				
543	Crowned Hornbill *Tockus alboterminatus*																	X			
549	Silvery-cheeked Hornbill *Bycanistes brevis*						X														
560	Moustached Green Tinkerbird *Pogoniulus leucomystax*																				
563	Yellow-rumped Tinkerbird *Pogoniulus bilineatus*			X			X	X													
606	Fine-banded Woodpecker *Campethera tullbergi*																				
610	Cardinal Woodpecker *Dendropicos fuscescens*																				X
651	Plain Martin *Riparia paludicola*																				
652	Sand Martin *Riparia riparia*																				
660	Barn Swallow *Hirundo rustica*																				
669	Common House Martin *Delichon urbica*																				
672	Black Saw-wing *Psalidoprocne holomelas*					X			X									X			X
676	Mountain Wagtail *Motacilla clara*																				
678	Yellow Wagtail *Motacilla flava*																				
689	Tree Pipit *Anthus trivialis*	X																			

Species number	Species	Transect number	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
702	Yellow-whiskered Greenbul *Andropadus latirostris*			X	X	X				X							X		X			
703	Slender-billed Greenbul *Andropadus gracilirostris*					X																
705	Mountain Greenbul *Andropadus nigriceps*				X	X												X				
713	Cabanis's Greenbul *Phyllastrephus cabanisi*				X																	
729	Common Bulbul *Pycnonotus barbatus*									X												
737	African Hill Babbler *Pseudoalcippe abyssinica*					X	X															
756	White-starred Robin *Pogonocichla stellata*											X								X		
769	Cape Robin-Chat *Cossypha caffra*																					X
771	Ruppell's Robin-Chat *Cossypha semirufa*			X	X																	
778	Brown-chested Alethe *Alethe poliocephala*																					
794	Common Stonechat *Saxicola torquata*																					
806	Alpine Chat *Cercomela sordida*																					
807	Northern Anteater Chat *Myrmecocichla aethiops*																					
814	Little Rock Thrush *Monticola rufocinereus*																					
816	Olive Thrush *Turdus olivaceus*																					
826	Abyssinian Ground Thrush *Zoothera piaggiae*																					
831	African Dusky Flycatcher *Muscicapa adusta*		X		X		X			X					X			X				
840	White-eyed Slaty Flycatcher *Melaenornis fischeri*							X	X	X								X	X			X
870	Blackcap *Sylvia atricapilla*									X		X										
873	Willow Warbler *Phylloscopus trochilus*							X	X	X				X		X						
876	Brown Woodland Warbler *Phylloscopus umbrovirens*					X	X				X		X				X			X	X	
884	Cinnamon Bracken Warbler *Bradypterus cinnamomeus*				X																	
892	Mountain Yellow Warbler *Chloropeta similis*																					

Species number	Species / Transect number	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
893	Singing Cisticola *Cisticola cantans*																				
898	Hunter's Cisticola *Cisticola hunteri*					X	X	X	X		X	X	X	X	X	X	X	X			X
910	Aberdare Cisticola *Cisticola aberdare*																				
933	Grey-backed Camaroptera *Camaroptera brachyura*																				
936	Yellow-breasted Apalis *Apalis flavida*																				
940	Chestnut-throated Apalis *Apalis porphyrolaema*	X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X		X
945	Grey Apalis *Apalis cinerea*			X	X		X		X				X	X			X				X
948	Black-throated Apalis *Apalis jacksoni*	X																X			
967	White-browed Crombec *Sylvietta leucophrys*																				
982	Montane White-eye *Zosterops poliogaster*				X		X	X	X		X	X					X				
983	Yellow White-eye *Zosterops senegalensis*													X							
990	White-bellied Tit *Parus albiventris*						X	X					X								
1002	White-tailed Crested Flycatcher *Trochocercus albonotatus*																				
1007	African Paradise Flycatcher *Terpsiphone viridis*						X														
1013	Chin-spot Batis *Batis molitor*							X													
1032	Red-backed Shrike *Lanius collurio*																		X		
1043	Common Fiscal *Lanius collaris*																				
1048	Brown-crowned Tchagra *Tchagra australis*																				
1053	Black-fronted Bush-Shrike *Malaconotus nigrifrons*		X					X													
1064	Tropical Boubou *Laniarius aethiopicus*					X			X				X			X	X				X
1072	Black-backed Puffback *Dryoscopus cubla*	X																			
1076	Black Cuckoo-shrike *Campephaga flava*																				
1080	Grey Cuckoo-shrike *Coracina caesia*						X	X													
1088	Montane Oriole *Oriolus percivali*	X	X	X					X					X	X	X	X	X			
1111	Greater Blue-eared Starling *Lamprotornis chalybaeus*																				
1140	Collared Sunbird *Anthreptes collaris*																				

Species number	Species	Transect number	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
1143	Olive Sunbird *Nectarinia olivacea*		X																X			
1152	Variable Sunbird *Nectarinia venusta*																					
1159	Northern Double-collared Sunbird *Nectarinia preussi*			X																		
1161	Eastern Double-collared Sunbird *Nectarinia mediocris*																					
1177	Tacazze Sunbird *Nectarinia tacazze*																					
1179	Bronze Sunbird *Nectarinia kilimensis*																					
1180	Golden-winged Sunbird *Nectarinia reichenowi*																					
1181	Malachite Sunbird *Nectarinia famosa*																					
1205	Baglafecht Weaver *Ploceus baglafecht*							X										X				X
1210	Spectacled Weaver *Ploceus ocularis*									X												X
1240	Brown-capped Weaver *Ploceus insignis*	X																				
1269	Grey-headed Negrofinch *Nigrita canicapilla*																					
1279	Abyssinian Crimsonwing *Cryptospiza salvadorii*																					
1299	Yellow-bellied Waxbill *Estrilda quartinia*																	X				
1305	Black-headed Waxbill *Estrilda atricapilla*																					
1311	Purple Grenadier *Uraeginthus ianthinogaster*																					
1318	Bronze Mannikin *Lonchura cucullata*																					
1319	Black-and-white Mannikin *Lonchura bicolor*																					
1332	Yellow-crowned Canary *Serinus canicollis*																					
1333	African Citril *Serinus citrinelloides*																					
1343	Streaky Seedeater *Serinus striolatus*							X	X													X
1344	Thick-billed Canary *Serinus burtoni*				X																	
	Total species on census		8	7	13	9	9	13	11	16	3	6	4	7	7	6	7	15	12	4	1	14

Table 23. (continued) Transects 81-100.

	Phase number	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6
	Elevation in feet (× 1000)	7.7	7.7	7.7	7.7	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.2	7.2	7.7	7.7	7.7	7.7	7.9	7.9	7.9
	Transect number	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Species number	Species																				
37	Cattle Egret *Bubulcus ibis*																				
62	Hadada Ibis *Bostrychia hagedash*					X		X													
63	African Green Ibis *Bostrychia olivacea*																				
79	African Black Duck *Anas sparsa*											X									
85	Yellow-billed Duck *Anas undulata*																				
117	African Harrier Hawk *Polyboroides typus*																				
125	African Goshawk *Accipiter tachiro*																				
134	Great Sparrowhawk *Accipiter melanoleucus*																				
139	Mountain Buzzard *Butëo oreophilus*				X			X													
142	Augur Buzzard *Buteo augur*																				
155	Long-crested Eagle *Lophaetus occipitalis*																X				
157	African Crowned Eagle *Stephanoaetus coronatus*																				
173	Greater Kestrel *Falco rupicoloides*																				
195	Scaly Francolin *Francolinus squamatus*																				
196	Jackson's Francolin *Francolinus jacksoni*																				
354	African Green Pigeon *Treron calva*																				
357	Tambourine Dove *Turtur tympanistria*																				
358	Blue-spotted Wood Dove *Turtur afer*										X										
365	Olive Pigeon *Columba arquatrix*																				
366	Speckled Pigeon *Columba guinea*																				
370	Red-eyed Dove *Streptopelia semitorquata*	X	X														X				
373	Ring-necked Dove *Streptopelia capicola*																				
376	Dusky Turtle Dove *Streptopelia lugens*																				
377	Laughing Dove *Streptopelia senegalensis*																				
380	Red-fronted Parrot *Poicephalus gulielmi*								X	X				X					X		
398	Hartlaub's Turaco *Tauraco hartlaubi*	X	X	X	X			X	X	X	X	X			X				X	X	X

Species number	Species	Transect number	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
409	Red-chested Cuckoo *Cuculus solitarius*				X																	
422	White-browed Coucal *Centropus superciliosus*										X											
468	Scarce Swift *Schoutedenapus myoptilus*																					
480	Speckled Mousebird *Colius striatus*																					
484	Narina Trogon *Apaloderma narina*																					
485	Bar-tailed Trogon *Apaloderma vittatum*																					
514	Cinnamon-chested Bee-eater *Merops oreobates*																					
524	Hoopoe *Upupa epops*																					
525	White-headed Wood-hoopoe *Phoeniculus bollei*																					
530	Common Scimitarbill *Rhinopomastus cyanomelas*																					
543	Crowned Hornbill *Tockus alboterminatus*																					
549	Silvery-cheeked Hornbill *Bycanistes brevis*																		X			
560	Moustached Green Tinkerbird *Pogoniulus leucomystax*																					
563	Yellow-rumped Tinkerbird *Pogoniulus bilineatus*				X							X	X	X	X							
606	Fine-banded Woodpecker *Campethera tullbergi*															X	X					
610	Cardinal Woodpecker *Dendropicos fuscescens*																					
651	Plain Martin *Riparia paludicola*																					
652	Sand Martin *Riparia riparia*																					
660	Barn Swallow *Hirundo rustica*																					
669	Common House Martin *Delichon urbica*																					
672	Black Saw-wing *Psalidoprocne holomelas*									X					X							
676	Mountain Wagtail *Motacilla clara*																					
678	Yellow Wagtail *Motacilla flava*																					

Species number	Species	Transect number	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
689	Tree Pipit *Anthus trivialis*																					
702	Yellow-whiskered Greenbul *Andropadus latirostris*		X				X	X	X	X	X	X	X	X				X	X			
703	Slender-billed Greenbul *Andropadus gracilirostris*																X					
705	Mountain Greenbul *Andropadus nigriceps*		X				X			X											X	
713	Cabanis's Greenbul *Phyllastrephus cabanisi*					X								X	X	X				X	X
729	Common Bulbul *Pycnonotus barbatus*																					
737	African Hill Babbler *Pseudoalcippe abyssinica*										X		X	X						X		
756	White-starred Robin *Pogonocichla stellata*																					
769	Cape Robin-Chat *Cossypha caffra*		X																			
771	Ruppell's Robin-Chat *Cossypha semirufa*																					X
778	Brown-chested Alethe *Alethe poliocephala*													X								
794	Common Stonechat *Saxicola torquata*																					
806	Alpine Chat *Cercomela sordida*																					
807	Northern Anteater Chat *Myrmecocichla aethiops*																					
814	Little Rock Thrush *Monticola rufocinereus*																					
816	Olive Thrush *Turdus olivaceus*					X																
826	Abyssinian Ground Thrush *Zoothera piaggiae*																					
831	African Dusky Flycatcher *Muscicapa adusta*		X		X	X		X		X	X											
840	White-eyed Slaty Flycatcher *Melaenornis fischeri*																		X			
870	Blackcap *Sylvia atricapilla*																					
876	Brown Woodland Warbler *Phylloscopus umbrovirens*	X			X				X			X	X			X				X		

Transect number		81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Species number	Species																				
884	Common Bracken Warbler *Bradypterus cinnamomeus*	X																X			
892	Mountain Yellow Warbler *Chloropeta similis*																			X	
893	Singing Cisticola *Cisticola cantans*																				
898	Hunter's Cisticola *Cisticola hunteri*	X	X	X	X	X		X													
910	Aberdare Cisticola *Cisticola aberdare*																				
933	Grey-backed Camaroptera *Camaroptera brachyura*																				
936	Yellow-breasted Apalis *Apalis flavida*																				
940	Chestnut-throated Apalis *Apalis porphyrolaema*	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
945	Grey Apalis *Apalis cinerea*	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
948	Black-throated Apalis *Apalis jacksoni*																				
967	White-browed Crombec *Sylvietta leucophrys*																			X	
982	Montane White-eye *Zosterops poliogaster*		X	X	X	X	X		X			X	X	X	X	X	X		X	X	
983	Yellow White-eye *Zosterops senegalensis*																				
990	White-bellied Tit *Parus albiventris*				X										X	X		X			
1002	White-tailed Crested Flycatcher *Trochocercus albonotatus*														X	X				X	
1007	African Paradise Flycatcher *Terpsiphone viridis*			X																	
1013	Chin-spot Batis *Batis molitor*				X																
1032	Red-backed Shrike *Lanius collurio*																				
1043	Common Fiscal *Lanius collaris*																				
1048	Brown-crowned Tchagra *Tchagra australis*																				
1053	Black-fronted Bush-Shrike *Malaconotus nigrifrons*																				
1064	Tropical Boubou *Laniarius aethiopicus*	X		X					X	X							X	X	X		X
1072	Black-backed Puffback *Dryoscopus cubla*																				

	Transect number	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Species number	Species																				
1076	Black Cuckoo-shrike *Campephaga flava*																				
1080	Grey Cuckoo-shrike *Coracina caesia*																			X	
1088	Montane Oriole *Oriolus percivali*		X			X			X	X	X		X	X					X		X
1111	Greater Blue-eared Starling *Lamprotornis chalybaeus*																				
1140	Collared Sunbird *Anthreptes collaris*																				
1143	Olive Sunbird *Nectarinia olivacea*						X	X	X												
1152	Variable Sunbird *Nectarinia venusta*																				
1159	Northern Double-collared Sunbird *Nectarinia preussi*																				
1161	Eastern Double-collared Sunbird *Nectarinia mediocris*																				
1177	Tacazze Sunbird *Nectarinia tacazze*																				
1179	Bronze Sunbird *Nectarinia kilimensis*																				
1180	Golden-winged Sunbird *Nectarinia reichenowi*																				
1181	Malachite Sunbird *Nectarinia famosa*																				
1205	Baglafecht Weaver *Ploceus baglafecht*																				
1210	Spectacled Weaver *Ploceus ocularis*																				
1240	Brown-capped Weaver *Ploceus insignis*					X										X					
1269	Grey-headed Negrofinch *Nigrita canicapilla*																				
1279	Abyssinian Crimsonwing *Cryptospiza salvadorii*																				
1299	Yellow-bellied Waxbill *Estrilda quartinia*					X						X	X								
1305	Black-headed Waxbill *Estrilda atricapilla*																				
1311	Purple Grenadier *Uraeginthus ianthinogaster*																				
1318	Bronze Mannikin *Lonchura cucullata*						X														
1319	Black-and-white Mannikin *Lonchura bicolor*												X								
1332	Yellow-crowned Canary *Serinus canicollis*																				
1333	African Citril *Serinus citrinelloides*																				
1343	Streaky Seedeater *Serinus striolatus*					X															
1344	Thick-billed Canary *Serinus burtoni*														X						
	Total species on census	9	10	9	12	12	7	9	12	9	9	9	11	9	9	10	7	8	7	13	7

Table 23. (continued) Transects 101-120.

	Phase number	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Elevation in feet (× 1000)	7.9	8	8	8	8	8.3	8.3	8.3	8.5	8.5	8.5	8.5	8.5	8.6	8.4	8.4	8.4	8.5	9.2	9.2
	Transect number	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Species number	Species																				
37	Cattle Egret *Bubulcus ibis*																				
62	Hadada Ibis *Bostrychia hagedash*			X					X	X	X	X			X						
63	African Green Ibis *Bostrychia olivacea*																				
79	African Black Duck *Anas sparsa*																				
85	Yellow-billed Duck *Anas undulata*																				
117	African Harrier Hawk *Polyboroides typus*																				
125	African Goshawk *Accipiter tachiro*																				X
134	Great Sparrowhawk *Accipiter melanoleucus*																				
139	Mountain Buzzard *Buteo oreophilus*						X														
142	Augur Buzzard *Buteo augur*																			X	
155	Long-crested Eagle *Lophaetus occipitalis*																				X
157	African Crowned Eagle *Stephanoaetus coronatus*																	X			
173	Greater Kestrel *Falco rupicoloides*																				
195	Scaly Francolin *Francolinus squamatus*																				
196	Jackson's Francolin *Francolinus jacksoni*																				X
354	African Green Pigeon *Treron calva*																				
357	Tambourine Dove *Turtur tympanistria*																				
358	Blue-spotted Wood Dove *Turtur afer*																				
365	Olive Pigeon *Columba arquatrix*																				
366	Speckled Pigeon *Columba guinea*																				
370	Red-eyed Dove *Streptopelia semitorquata*																				
373	Ring-necked Dove *Streptopelia capicola*																				
376	Dusky Turtle Dove *Streptopelia lugens*									X	X	X					X				

Species number	Species / Transect number	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
377	Laughing Dove *Streptopelia senegalensis*																				
380	Red-fronted Parrot *Poicephalus gulielmi*						X		X												
398	Hartlaub's Turaco *Tauraco hartlaubi*	X	X				X	X	X								X		X	X	
409	Red-chested Cuckoo *Cuculus solitarius*																				
422	White-browed Coucal *Centropus superciliosus*			X																	
468	Scarce Swift *Schoutedenapus myoptilus*																				
480	Speckled Mousebird *Colius striatus*																				
484	Narina Trogon *Apaloderma narina*									X	X	X	X		X		X		X		
485	Bar-tailed Trogon *Apaloderma vittatum*	X																			
514	Cinnamon-chested Bee-eater *Merops oreobates*													X							
524	Hoopoe *Upupa epops*																				
525	White-headed Wood-hoopoe *Phoeniculus bollei*																		X		
530	Common Scimitarbill *Rhinopomastus cyanomelas*																				
543	Crowned Hornbill *Tockus alboterminatus*																				
549	Silvery-cheeked Hornbill *Bycanistes brevis*																				
560	Moustached Green Tinkerbird *Pogoniulus leucomystax*																				
563	Yellow-rumped Tinkerbird *Pogoniulus bilineatus*														X						
606	Fine-banded Woodpecker *Campethera tullbergi*																				
610	Cardinal Woodpecker *Dendropicos fuscescens*																				
651	Plain Martin *Riparia paludicola*																				

Transect number		101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Species number	Species																				
652	Sand Martin *Riparia riparia*								X												
660	Barn Swallow *Hirundo rustica*																				
669	Common House Martin *Delichon urbica*																				
672	Black Saw-wing *Psalidoprocne holomelas*	X					X	X	X					X				X			
676	Mountain Wagtail *Motacilla clara*																				
678	Yellow Wagtail *Motacilla flava*																				
689	Tree Pipit *Anthus trivialis*																				
702	Yellow-whiskered Greenbul *Andropadus latirostris*																				
703	Slender-billed Greenbul *Andropadus gracilirostris*																				
705	Mountain Greenbul *Andropadus nigriceps*	X						X	X									X			
713	Cabanis's Greenbul *Phyllastrephus cabanisi*																				
729	Common Bulbul *Pycnonotus barbatus*					X									X						
737	African Hill Babbler *Pseudoalcippe abyssinica*																X		X	X	
756	White-starred Robin *Pogonocichla stellata*			X				X													
769	Cape Robin-Chat *Cossypha caffra*																				
771	Ruppell's Robin-Chat *Cossypha semirufa*																				
778	Brown-chested Alethe *Alethe poliocephala*																				
794	Common Stonechat *Saxicola torquata*																				
806	Alpine Chat *Cercomela sordida*																				
807	Northern Anteater Chat *Myrmecocichla aethiops*																				

Species Number	Species	Transect number	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
814	Little Rock Thrush *Monticola rufocinereus*																					
816	Olive Thrush *Turdus olivaceus*						X				X				X	X						
826	Abyssinian Ground Thrush *Zoothera piaggiae*																					
831	African Dusky Flycatcher *Muscicapa adusta*							X		X			X									
840	White-eyed Slaty Flycatcher *Melaenornis fischeri*															X						
870	Blackcap *Sylvia atricapilla*																					
873	Willow Warbler *Phylloscopus trochilus*													X	X							
876	Brown Woodland Warbler *Phylloscopus umbrovirens*			X			X		X		X	X		X			X	X		X	X	X
884	Cinnamon Bracken Warbler *Bradypterus cinnamomeus*					X	X		X	X				X							X	
892	Mountain Yellow Warbler *Chloropeta similis*											X										
893	Singing Cisticola *Cisticola cantans*																					
898	Hunter's Cisticola *Cisticola hunteri*	X	X	X	X	X	X		X		X	X	X	X	X				X		X	
910	Aberdare Cisticola *Cisticola aberdare*																					
933	Grey-backed Camaroptera *Camaroptera brachyura*																					
936	Yellow-breasted Apalis *Apalis flavida*																					
940	Chestnut-throated Apalis *Apalis porphyrolaema*	X	X	X	X	X	X	X	X			X					X		X		X	X
945	Grey Apalis *Apalis cinerea*	X	X	X			X	X														
948	Black-throated Apalis *Apalis jacksoni*																					
967	White-browed Crombec *Sylvietta leucophrys*																					

Transect number		101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Species Number	Species																				
982	Montane White-eye *Zosterops poliogaster*			X		X			X	X						X		X	X		X
983	Yellow White-eye *Zosterops senegalensis*																				
990	White-bellied Tit *Parus albiventris*	X																			
1002	White-tailed Crested Flycatcher *Trochocercus albonotatus*															X					
1007	African Paradise Flycatcher *Terpsiphone viridis*																				
1013	Chin-spot Batis *Batis molitor*																				
1032	Red-backed Shrike *Lanius collurio*																				
1043	Common Fiscal *Lanius collaris*																				
1048	Brown-crowned Tchagra *Tchagra australis*																				
1053	Black-fronted Bush-Shrike *Malaconotus nigrifrons*																				
1064	Tropical Boubou *Laniarius aethiopicus*	X	X	X	X	X	X	X			X			X	X	X					X
1072	Black-backed Puffback *Dryoscopus cubla*																				
1076	Black Cuckoo-shrike *Campephaga flava*																				
1080	Grey Cuckoo-shrike *Coracina caesia*																				X
1088	Montane Oriole *Oriolus percivali*				X																
1111	Greater Blue-eared Starling *Lamprotornis chalybaeus*																				
1140	Collared Sunbird *Anthreptes collaris*																				
1143	Olive Sunbird *Nectarinia olivacea*	X																			
1152	Variable Sunbird *Nectarinia venusta*																				
1159	Northern Double-collared Sunbird *Nectarinia preussi*	X																			
1161	Eastern Double-collared Sunbird *Nectarinia mediocris*						X		X	X											
1177	Tacazze Sunbird *Nectarinia tacazze*																				

	Transect number	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Species number	Species																				
1179	Bronze Sunbird *Nectarinia kilimensis*																				
1180	Golden-winged Sunbird *Nectarinia reichenowi*																				
1181	Malachite Sunbird *Nectarinia famosa*																				
1205	Baglafecht Weaver *Ploceus baglafecht*																				
1210	Spectacled Weaver *Ploceus ocularis*																				
1240	Brown-capped Weaver *Ploceus insignis*																				
1269	Grey-headed Negrofinch *Nigrita canicapilla*												X								
1279	Abyssinian Crimsonwing *Cryptospiza salvadorii*																				
1299	Yellow-bellied Waxbill *Estrilda quartinia*					X															
1305	Black-headed Waxbill *Estrilda atricapilla*																				
1311	Purple Grenadier *Uraeginthus ianthinogaster*																				
1318	Bronze Mannikin *Lonchura cucullata*																				
1319	Black-and-white Mannikin *Lonchura bicolor*																				
1332	Yellow-crowned Canary *Serinus canicollis*													X	X					X	
1333	African Citril *Serinus citrinelloides*																				
1343	Streaky Seedeater *Serinus striolatus*				X	X								X	X						
1344	Thick-billed Canary *Serinus burtoni*																				
	Total species on census	11	6	8	6	10	10	9	12	7	7	6	6	8	9	5	5	6	6	8	8

Table 23. (continued) Transects 121-140.

	Phase number	7	7	7	7	7	7	7	7	7	7	8	7	7	7	7	7	7	7	7	7
	Elevation in feet (× 1000)	9.2	9.2	9.4	9.7	9.7	9.9	10.1	10.3	10.5	10.7	8.7	8.7	8.7	8.6	8.6	8.6	10.3	9.1	9.6	9.6
	Transect number	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Species number	Species																				
37	Cattle Egret *Bubulcus ibis*																				
62	Hadada Ibis *Bostrychia hagedash*																				
63	African Green Ibis *Bostrychia olivacea*																				X
79	African Black Duck *Anas sparsa*																				
85	Yellow-billed Duck *Anas undulata*																				
117	African Harrier Hawk *Polyboroides typus*																				
125	African Goshawk *Accipiter tachiro*				X																
134	Great Sparrowhawk *Accipiter melanoleucus*																				
139	Mountain Buzzard *Buteo oreophilus*				X	X	X				X						X				
142	Augur Buzzard *Buteo augur*		X	X														X			
155	Long-crested Eagle *Lophaetus occipitalis*																				
157	African Crowned Eagle *Stephanoaetus coronatus*						X														
173	Greater Kestrel *Falco rupicoloides*																				
195	Scaly Francolin *Francolinus squamatus*																				
196	Jackson's Francolin *Francolinus jacksoni*																		X		
354	African Green Pigeon *Treron calva*																				
357	Tambourine Dove *Turtur tympanistria*																				
358	Blue-spotted Wood Dove *Turtur afer*																				
365	Olive Pigeon *Columba arquatrix*																				
366	Speckled Pigeon *Columba guinea*																				
370	Red-eyed Dove *Streptopelia semitorquata*																				

Species number	Species / Transect number	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
373	Ring-necked Dove *Streptopelia capicola*																				
376	Dusky Turtle Dove *Streptopelia lugens*	X	X																		
377	Laughing Dove *Streptopelia senegalensis*																				
380	Red-fronted Parrot *Poicephalus gulielmi*																				
398	Hartlaub's Turaco *Tauraco hartlaubi*				X	X			X	X						X	X				
409	Red-chested Cuckoo *Cuculus solitarius*																				
422	White-browed Coucal *Centropus superciliosus*																				
468	Scarce Swift *Schoutedenapus myoptilus*																				
480	Speckled Mousebird *Colius striatus*														X						
484	Narina Trogon *Apaloderma narina*						X					X	X	X							
485	Bar-tailed Trogon *Apaloderma vittatum*																				
514	Cinnamon-chested Bee-eater *Merops oreobates*																				X
524	Hoopoe *Upupa epops*																				
525	White-headed Wood-hoopoe *Phoeniculus bollei*																				
530	Common Scimitarbill *Rhinopomastus cyanomelas*																				
543	Crowned Hornbill *Tockus alboterminatus*																				
549	Silvery-cheeked Hornbill *Bycanistes brevis*																				
560	Moustached Green Tinkerbird *Pogoniulus leucomystax*																				
563	Yellow-rumped Tinkerbird *Pogoniulus bilineatus*																				

Transect number		121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Species number	Species																				
606	Fine-banded Woodpecker *Campethera tullbergi*																				
610	Cardinal Woodpecker *Dendropicos fuscescens*																				
651	Plain Martin *Riparia paludicola*														X	X	X				
652	Sand Martin *Riparia riparia*																				
660	Barn Swallow *Hirundo rustica*																				
669	Common House Martin *Delichon urbica*																				
672	Black Saw-wing *Psalidoprocne holomelas*															X	X		X		
676	Mountain Wagtail *Motacilla clara*																				
678	Yellow Wagtail *Motacilla flava*																				
689	Tree Pipit *Anthus trivialis*																				
702	Yellow-whiskered Greenbul *Andropadus latirostris*																				
703	Slender-billed Greenbul *Andropadus gracilirostris*																				
705	Mountain Greenbul *Andropadus nigriceps*	X									X										
713	Cabanis's Greenbul *Phyllastrephus cabanisi*																				
729	Common Bulbul *Pycnonotus barbatus*												X		X	X	X				
737	African Hill Babbler *Pseudoalcippe abyssinica*																				
756	White-starred Robin *Pogonocichla stellata*							X				X									
769	Cape Robin-Chat *Cossypha caffra*																				
771	Ruppell's Robin-Chat *Cossypha semirufa*																				
778	Brown-chested Alethè *Alethe poliocephala*																				

Species number	Species	Transect number	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
794	Common Stonechat *Saxicola torquata*																					
806	Alpine Chat *Cercomela sordida*																		X			
807	Northern Anteater Chat *Myrmecocichla aethiops*																					
814	Little Rock Thrush *Monticola rufocinereus*																					
816	Olive Thrush *Turdus olivaceus*		X							X			X				X				X
826	Abyssinian Ground Thrush *Zoothera piaggiae*																					
831	African Dusky Flycatcher *Muscicapa adusta*	X					X															
840	White-eyed Slaty Flycatcher *Melaenornis fischeri*		X																			
870	Blackcap *Sylvia atricapilla*																					
873	Willow Warbler *Phylloscopus trochilus*																					
876	Brown Woodland Warbler *Phylloscopus umbrovirens*	X				X	X	X	X		X	X	X									
884	Cinnamon Bracken Warbler *Bradypterus cinnamomeus*	X			X	X	X					X			X		X	X	X		X
892	Mountain Yellow Warbler *Chloropeta similis*											X	X	X					X			
893	Singing Cisticola *Cisticola cantans*																					
898	Hunter's Cisticola *Cisticola hunteri*		X	X	X						X	X	X		X	X	X	X	X	X	X	X
910	Aberdare Cisticola *Cisticola aberdare*																					
933	Grey-backed Camaroptera *Camaroptera brachyura*																					
936	Yellow-breasted Apalis *Apalis flavida*																					
940	Chestnut-throated Apalis *Apalis porphyrolaema*	X		X	X	X		X				X	X	X	X		X					

Species number	Species / Transect number	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
945	Grey Apalis *Apalis cinerea*																				
948	Black-throated Apalis *Apalis jacksoni*																				
967	White-browed Crombec *Sylvietta Leucophrys*																				
982	Montane White-eye *Zosterops Poliogaster*								X	X			X	X	X	X					
983	Yellow White-eye *Zosterops Senegalensis*																				
990	White-bellied Tit *Parus albiventris*																				
1002	White-tailed Crested Flycatcher *Trochocercus albonotatus*																				
1007	African Paradise Flycatcher *Terpsiphone Viridis*																				
1013	Chin-spot Batis *Batis molitor*																				
1032	Red-backed Shrike *Lanius collurio*																				
1043	Common Fiscal *Lanius collaris*																	X			
1048	Brown-crowned Tchagra *Tchagra Australis*																				
1053	Black-fronted Bush-Shrike *Malaconotus Nigrifrons*																				
1064	Tropical Boubou *Laniarius aethiopicus*	X			X			X						X		X		X			
1072	Black-backed Puffback *Dryoscopus Cubla*																				
1076	Black Cuckoo-shrike *Campephaga flava*																				
1080	Grey Cuckoo-shrike *Coracina caesia*																				
1088	Montane Oriole *Oriolus percivali*																				
1111	Greater Blue-eared Starling *Lamprotornis Chalybaeus*																				
1140	Collared Sunbird *Anthreptes collaris*																				
1143	Olive Sunbird *Nectarinia olivacea*																				
1152	Variable Sunbird *Nectarinia venusta*																				

Transect number		121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Species number	Species																				
1159	Northern Double-collared *Nectarinia preussi*																				
1161	Eastern Double-collared Sunbird *Nectarinia mediocris*								X	X											
1177	Tacazze Sunbird *Nectarinia tacazze*									X											
1179	Bronze Sunbird *Nectarinia kilimensis*																				
1180	Golden-winged Sunbird *Nectarinia reichenowi*								X	X	X									X	X
1181	Malachite Sunbird *Nectarinia famosa*																	X			
1205	Baglafecht Weaver *Ploceus baglafecht*																				
1210	Spectacled Weaver *Ploceus ocularis*																				
1240	Brown-capped Weaver *Ploceus insignis*																				
1269	Grey-headed Negrofinch *Nigrita canicapilla*																				
1279	Abyssinian Crimsonwing *Cryptospiza salvadorii*																				
1299	Yellow-bellied Waxbill *Estrilda quartinia*																				
1305	Black-headed Waxbill *Estrilda atricapilla*																				
1311	Purple Grenadier *Uraeginthus ianthinogaster*																				
1318	Bronze Mannikin *Lonchura cucullata*																				
1319	Black-and-white Mannikin *Lonchura bicolor*																				
1332	Yellow-crowned Canary *Serinus canicollis*		X							X											
1333	African Citril *Serinus citrinelloides*																				
1343	Streaky Seedeater *Serinus striolatus*		X						X		X						X	X			
1344	Thick-billed Canary *Serinus burtoni*																				
	Total species on census	7	7	3	7	5	6	4	6	8	6	7	7	6	7	7	10	8	5	2	6

Table 23. (continued) Transect 141-158.

	Phase number	7	7	7	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8
	Elevation in feet (× 1000)	9.9	9.8	9.4	9.3	9.3	9.3	9.7	9.7	9.7	9.7	9.3	8.7	8.4	8.4	8.4	8.1	8.2	8.2
	Transect number	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158
Species number	Species																		
37	Cattle Egret *Bubulcus ibis*																		
62	Hadada Ibis *Bostrychia hagedash*												X				X		
63	African Green Ibis *Bostrychia olivacea*																		
79	African Black Duck *Anas sparsa*																		
85	Yellow-billed Duck *Anas undulata*		X																
117	African Harrier Hawk *Polyboroides typus*																		
125	African Goshawk *Accipiter tachiro*																		
134	Great Sparrowhawk *Accipiter melanoleucus*																		
139	Mountain Buzzard *Buteo oreophilus*				X									X	X			X	
142	Augur Buzzard *Buteo augur*																		
155	Long-crested Eagle *Lophaetus occipitalis*																		
157	African Crowned Eagle *Stephanoaetus coronatus*																		
173	Greater Kestrel *Falco rupicoloides*																		
195	Scaly Francolin *Francolinus squamatus*																		
196	Jackson's Francolin *Francolinus jacksoni*																		
354	African Green Pigeon *Treron calva*																		
357	Tambourine Dove *Turtur tympanistria*																		
358	Blue-spotted Wood Dove *Turtur afer*																		
365	Olive Pigeon *Columba arquatrix*																		
366	Speckled Pigeon *Columba guinea*																		
370	Red-eyed Dove *Streptopelia semitorquata*																		
373	Ring-necked Dove *Streptopelia capicola*																		
376	Dusky Turtle Dove *Streptopelia lugens*		X		X									X	X	X			X
377	Laughing Dove *Streptopelia senegalensis*								X						X				
380	Red-fronted Parrot *Poicephalus gulielmi*																		
398	Hartlaub's Turaco *Tauraco hartlaubi*													X			X	X	

Species number	Species	Transect number	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158
409	Red-chested Cuckoo *Cuculus solitarius*																			
422	White-browed Coucal *Centropus superciliosus*																			
468	Scarce Swift *Schoutedenapus myoptilus*			X																
480	Speckled Mousebird *Colius striatus*																			
484	Narina Trogon *Apaloderma narina*																			
485	Bar-tailed Trogon *Apaloderma vittatum*																			
514	Cinnamon-chested Bee-eater *Merops oreobates*																			
524	Hoopoe *Upupa epops*																			
525	White-headed Wood-hoopoe *Phoeniculus bollei*																			
530	Common Scimitarbill *Rhinopomastus cyanomelas*																			
543	Crowned Hornbill *Tockus alboterminatus*																			
549	Silvery-cheeked Hornbill *Bycanistes brevis*																			
560	Moustached Green Tinkerbird *Pogoniulus leucomystax*																			
563	Yellow-rumped Tinkerbird *Pogoniulus bilineatus*														X					
606	Fine-banded Woodpecker *Campethera tullbergi*																			
610	Cardinal Woodpecker *Dendropicos fuscescens*																			
651	Plain Martin *Riparia paludicola*			X	X															
652	Sand Martin *Riparia riparia*																			
660	Barn Swallow *Hirundo rustica*																			
669	Common House Martin *Delichon urbica*																			
672	Black Saw-wing *Psalidoprocne holomelas*														X					
676	Mountain Wagtail *Motacilla clara*																			
678	Yellow Wagtail *Motacilla flava*																			

Species number	Species / Transect number	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158
689	Tree Pipit *Anthus trivialis*																		
702	Yellow-whiskered Greenbul *Andropadus latirostris*																		
703	Slender-billed Greenbul *Andropadus gracilirostris*																		
705	Mountain Greenbul *Andropadus nigriceps*																		
713	Cabanis's Greenbul *Phyllastrephus cabanisi*																		
729	Common Bulbul *Pycnonotus barbatus*													X				X	X
737	African Hill Babbler *Pseudoalcippe abyssinica*																		
756	White-starred Robin *Pogonocichla stellata*																		X
769	Cape Robin-Chat *Cossypha caffra*																		
771	Ruppell's Robin-Chat *Cossypha semirufa*																		
778	Brown-chested Alethe *Alethe poliocephala*																		
794	Common Stonechat *Saxicola torquata*																		
806	Alpine Chat *Cercomela sordida*																		
807	Northern Anteater Chat *Myrmecocichla aethiops*																		
814	Little Rock Thrush *Monticola rufocinereus*																		
816	Olive Thrush *Turdus olivaceus*						X						X						
826	Abyssinian Ground Thrush *Zoothera piaggiae*																		
831	African Dusky Flycatcher *Muscicapa adusta*						X	X		X		X		X					
840	White-eyed Slaty Flycatcher *Melaenornis fischeri*													X			X		
870	Blackcap *Sylvia atricapilla*																		
873	Willow Warbler *Phylloscopus trochilus*																		

Species number	Species / Transect number	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158
876	Brown Woodland Warbler *Phylloscopus umbrovirens*													X					
884	Cinnamon Bracken Warbler *Bradypterus cinnamomeus*	X	X	X				X										X	X
892	Mountain Yellow Warbler *Chloropeta similis*				X			X				X						X	
893	Singing Cisticola *Cisticola cantans*																		
898	Hunter's Cisticola *Cisticola hunteri*	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	
910	Aberdare Cisticola *Cisticola aberdare*																		
933	Grey-backed Camaroptera *Camaroptera brachyura*																		
936	Yellow-breasted Apalis *Apalis flavida*																		
940	Chestnut-throated Apalis *Apalis porphyrolaema*											X	X	X	X	X	X	X	X
945	Grey Apalis *Apalis cinerea*																		
948	Black-throated Apalis *Apalis jacksoni*																		
967	White-browed Crombec *Sylvietta leucophrys*																		
982	Montane White-eye *Zosterops poliogaster*							X	X		X	X		X			X		
983	Yellow White-eye *Zosterops senegalensis*																		
990	White-bellied Tit *Parus albiventris*																		
1002	White-tailed Crested Flycatcher *Trochocercus albonotatus*																		
1007	African Paradise Flycatcher *Terpsiphone viridis*																		
1013	Chin-spot Batis *Batis molitor*									X	X					X			
1032	Red-backed Shrike *Lanius collurio*																		
1043	Common Fiscal *Lanius collaris*																		
1048	Brown-crowned Tchagra *Tchagra australis*																		
1053	Black-fronted Bush-Shrike *Malaconotus nigrifrons*																		

Species number	Species	Transect number	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158
1064	Tropical Boubou *Laniarius aethiopicus*			X										X	X	X	X		X	X
1072	Black-backed Puffback *Dryoscopus cubla*																			
1076	Black Cuckoo-shrike *Campephaga flava*																			
1080	Grey Cuckoo-shrike *Coracina caesia*																			
1088	Montane Oriole *Oriolus percivali*																			
1111	Greater Blue-eared Starling *Lamprotornis chalybaeus*																			
1140	Collared Sunbird *Anthreptes collaris*																			
1143	Olive Sunbird *Nectarinia olivacea*																			
1152	Variable Sunbird *Nectarinia venusta*																			
1159	Northern Double-collared Sunbird *Nectarinia preussi*																			
1161	Eastern Double-collared Sunbird *Nectarinia mediocris*						X		X			X								
1177	Tacazze Sunbird *Nectarinia tacazze*					X	X			X	X									
1179	Bronze Sunbird *Nectarinia kilimensis*																			
1180	Golden-winged Sunbird *Nectarinia reichenowi*					X			X	X										
1181	Malachite Sunbird *Nectarinia famosa*																			
1205	Baglafecht Weaver *Ploceus baglafecht*							X	X											
1210	Spectacled Weaver *Ploceus ocularis*																			
1240	Brown-capped Weaver *Ploceus insignis*																			
1269	Grey-headed Negrofinch *Nigrita canicapilla*						X	X												
1279	Abyssinian Crimsonwing *Cryptospiza salvadorii*																			
1299	Yellow-bellied Waxbill *Estrilda quartinia*																			
1305	Black-headed Waxbill *Estrilda atricapilla*																			
1311	Purple Grenadier *Uraeginthus ianthinogaster*																			
1318	Bronze Mannikin *Lonchura cucullata*																			

	Transect number	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158
Species number	Species																		
1319	Black-and-white Mannikin *Lonchura bicolor*																		
1332	Yellow-crowned Canary *Serinus canicollis*																		
1333	African Citril *Serinus citrinelloides*																		
1343	Streaky Seedeater *Serinus striolatus*						X	X	X	X	X	X	X				X		
1344	Thick-billed Canary *Serinus burtoni*																		
	Total species on census	2	6	4	4	3	7	8	7	6	5	7	6	13	5	4	7	8	6

Table 25. Species of birds detected by Tom Butynski during 1994-96 in the Aberdares ecosystem, Kenya, that were not observed During the Aberdares wildlife fence study (i. e. these are not listed in Tables 20 & 21). All common and scientific names according to EANHS (1996).

Species number	F or FF*	Common name	Scientific name	Place	Date	Elevation (feet)	Phase
47		Great Egret	*Casmerodius albus*	North Mathioya	Jan. 95	6,700	4
48		Grey Heron	*Ardea cinerea*	Kieni Forest	Mar.95	7,400	5
202	F	Crested Guineafowl	*Guttera pucherani*	Kieni Forest	Jul. 95	7,400	5
301		African Snipe	*Gallinago nigripennis*	Sapper Hut (moorland)	Aug. 94	10,500	Central
314		Common Sandpiper	*Actitis hypoleucos*	North Mathioya	Jan. 94	6,700	4
416	FF	Barred Long-tailed Cuckoo	*Cercococcyx montanus*	Kieni Forest	Jan. 95	7,500	5
417	F	African Emerald Cuckoo	*Chrysococcyx cupreus*	Mathioya	Jan. 95	7,800	4
616		Grey Woodpecker	*Dendropicos goertae*	Kieni Forest	Jul. 95	7,400	5
657		Wire-tailed Swallow	*Hirundo smithii*	North Mathioya	Jan. 94	6,700	4
693		Sharpe's Longclaw	*Macronyx sharpei*	Kieni Forest Station	Feb. 96	7,400	5
751	FF	Mountain Illadopsis	*Illadopsis pyrrhoptera*	Gatamayu	Aug. 94	7,200	5
872	F	Chiffchaff	*Phylloscopus collybita*	Kieni Forest	Jan.,Mar. 95	7,400	5
905		Levaillant's Cisticola	*Cisticola tinniens*	Sapper Hut (moorland)	Aug.94	10,500	Central
963		Red-faced Crombec	*Sylvietta whytii*	Kieni Forest	Mar.95	7,400	5
1102	FF	Waller's Starling	*Onychognathus walleri*	Kieni Forest	Jan. 95	7,500	5
1105	F	Slender-billed Starling	*Onychognathus morio*	North Mathioya	Jan. 95	7,800	4
1122		Abbott's Starling	*Cinnyricinclus femoralis*	Kieni Forest	Oct. 96	7,400	5
1146	F	Green-headed Sunbird	*Nectarinia verticalis*	Gatamayu	Aug. 94	7,200	5
1203		Grosbeak Weaver	*Amblyospiza albifrons*	Kieni Forest	Jul. 95	7,400	5
1214		Holub's Golden Weaver	*Ploceus xanthops*	North Mathioya	Jan. 95	6,700	4
1328		Pin-tailed Whydah	*Vidua macroura*	North Mathioya	Jan. 94	6,700	4

F = "Forest generalist" and FF = "Forest dependent" (see Table 18 caption).

Table 24. Species of forest birds found in the northern (drier) half (i.e., north of 0.5^{0} S) of the Aberdares ecosystem which are not recorded for the southern (wetter) half of the Aberdares ecosystem (i.e., south of 0.5^{0} S) and vice versa. Data are from this fence placement study and from the Ornithology Department, National Museums of Kenya. All common and scientific names according to EANHS (1996).

Birds found only in the northern Aberdares.

Species number	F or FF	Common name	Scientific name
443	FF	African Barred Owlet	*Glaucidium capense*
751	FF	Mountain Illadopsis	*Illadopsis pyrrhoptera*
883	FF	Evergreen Forest Warbler	*Bradypterus lopezi*
1071	F	Northern Puffback	*Dryoscopus gambensis*
1183	F	Superb Sunbird	*Nectarinia superba*
1211	FF	Black-billed Weaver	*Ploceus melanogaster*

Birds found only in the southern Aberdares.

Species number	F or FF	Common name	Scientific name
416	FF	Barred Long-tailed Cuckoo	*Cercococcyx montanus*
421	F	Yellowbill	*Ceuthmochares aereus*
467	F	Mottled Spinetail	*Telecanthura ussheri*
547	F	Trumpeter Hornbill	*Bycanistes bucinator*
622	FF	African Pitta	*Pitta angolensis*
778	FF	Brown-chested Alethe	*Alethe poliocephala*
825	FF	Orange Ground Thrush	*Zoothera gurneyi*

F = " Forest generalist" and FF = " Forest specialist" (see Table 18 caption).

ABERDARES FENCE PROJECT RESEARCH: BIRD POINT-COUNTS

Observers:_____
Date:_____

Phase:_____ Section:_____ Transect no.:_____ Altitude (ft):_____

Habitat type:

Map:

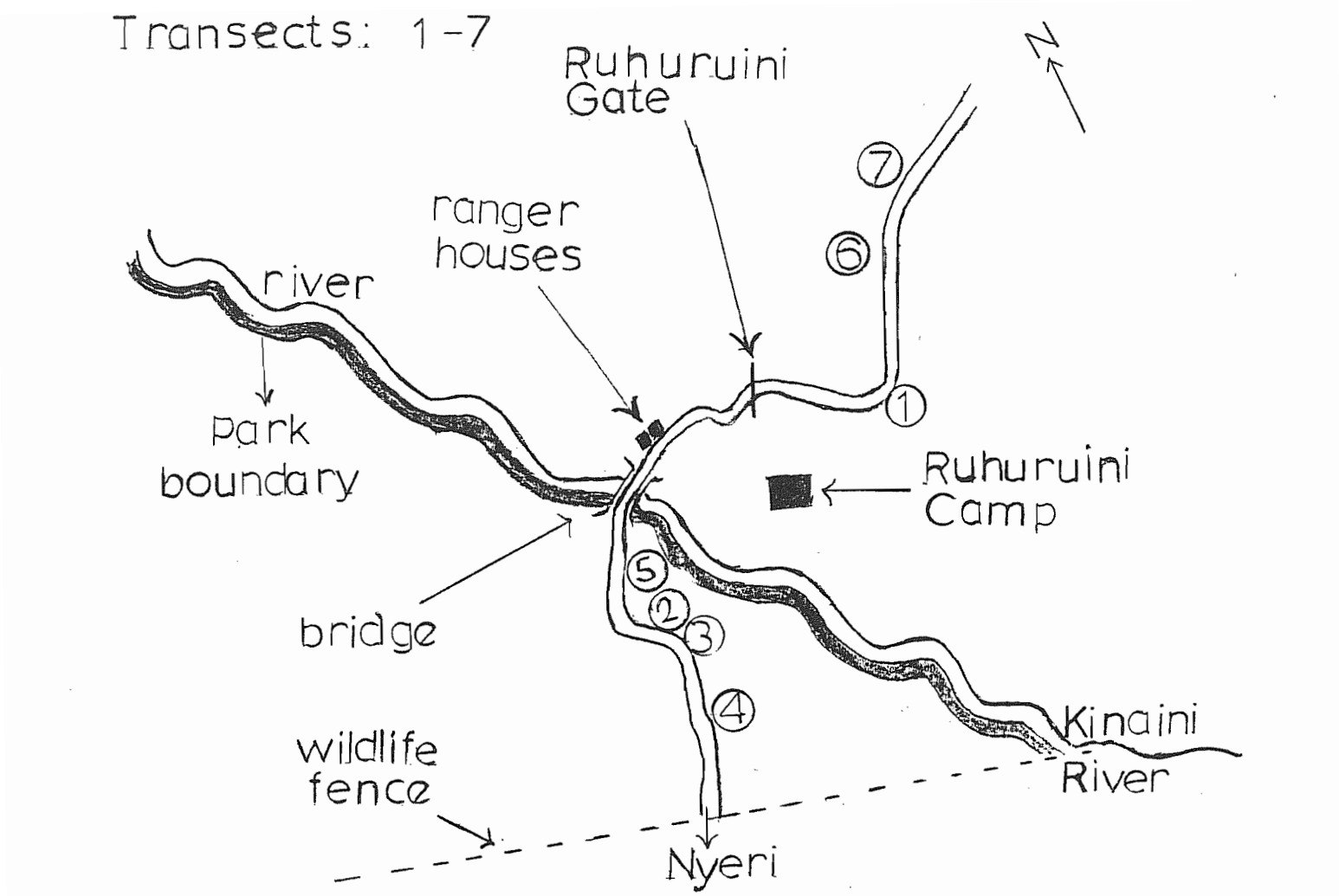
Time start	Species	<20 m	>20 m

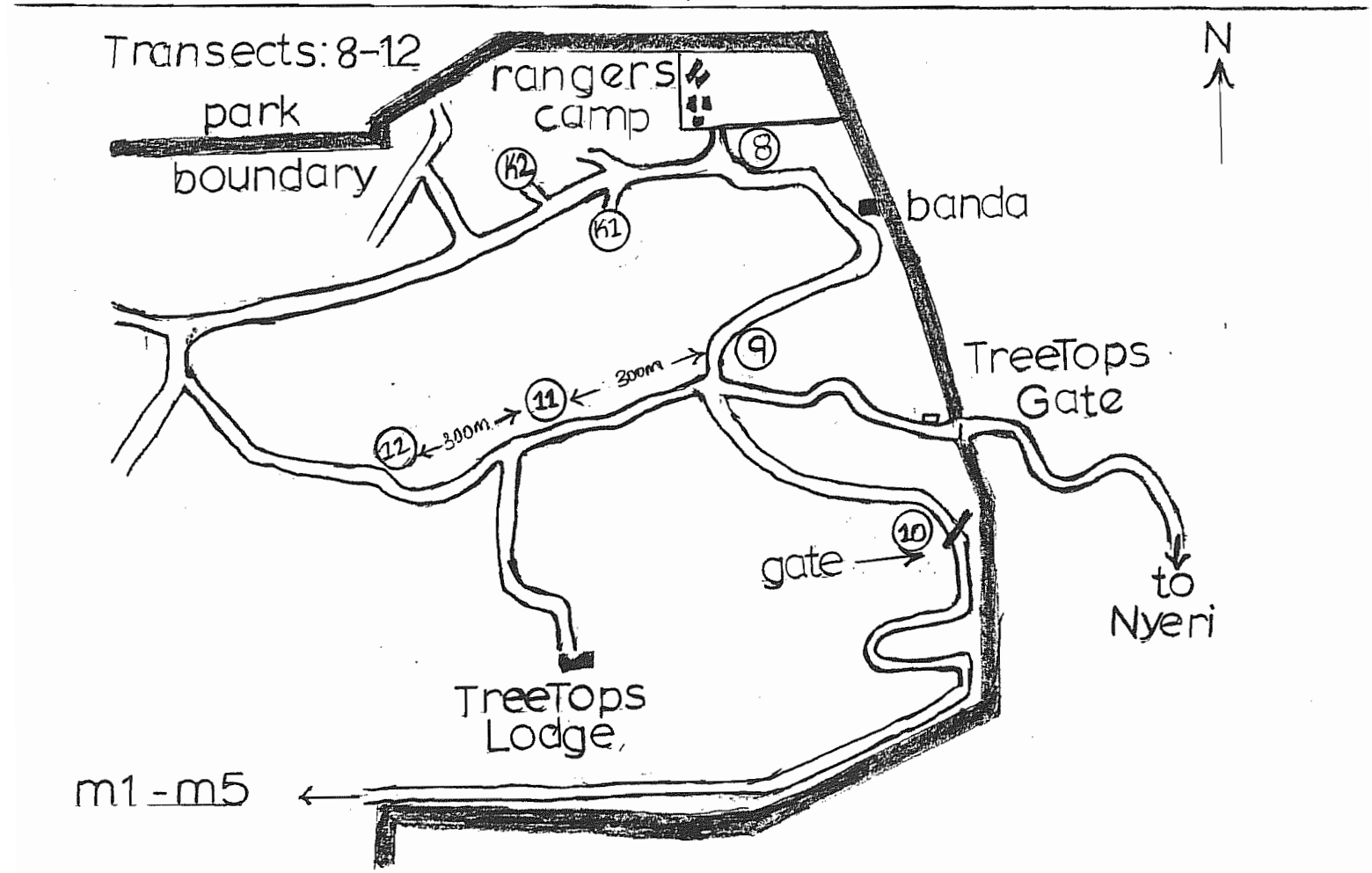
LOCATIONS 0F THE 158 15-MINUTE BIRD

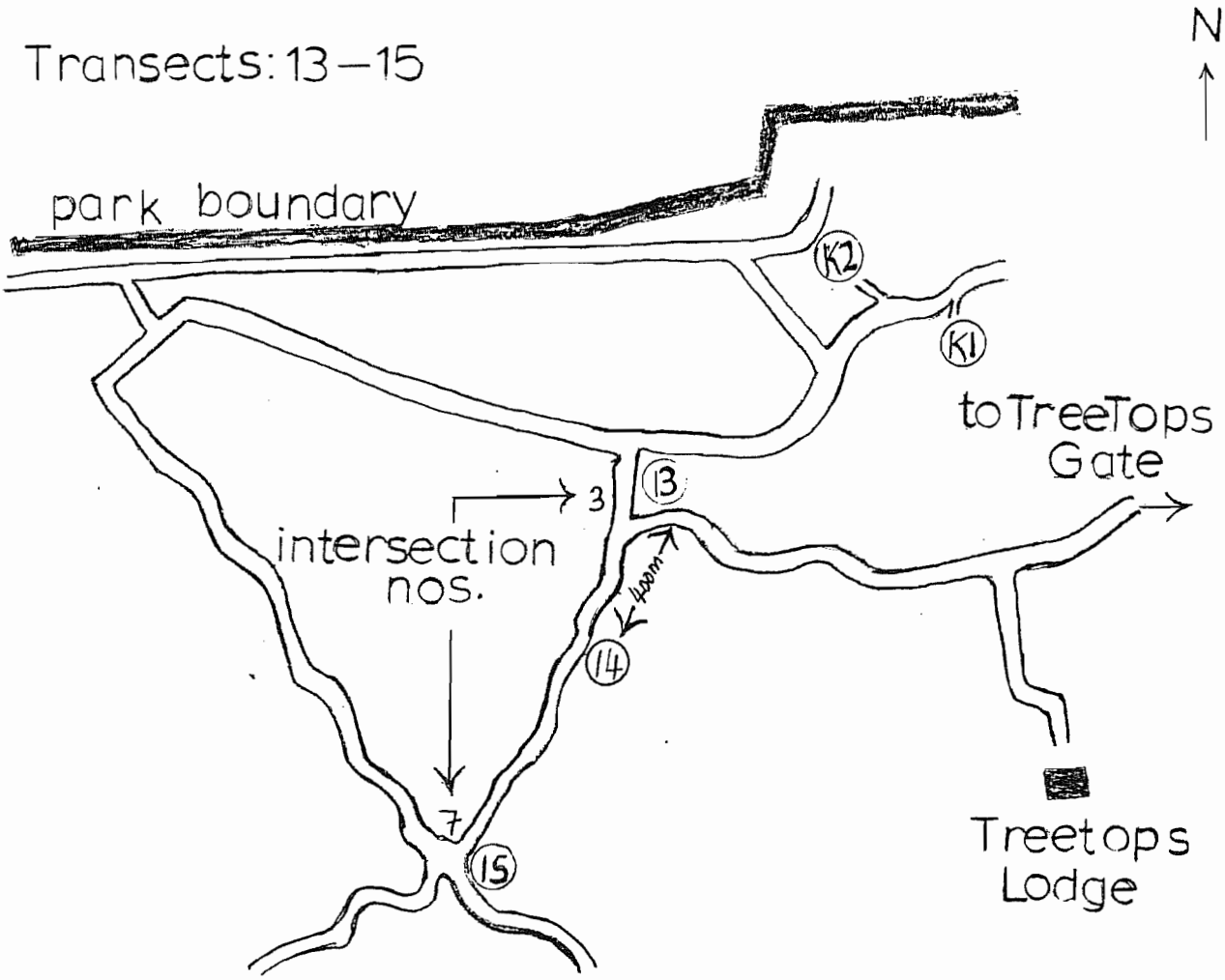
CENSUSES CONDUCTED DURING THE ABERDARES

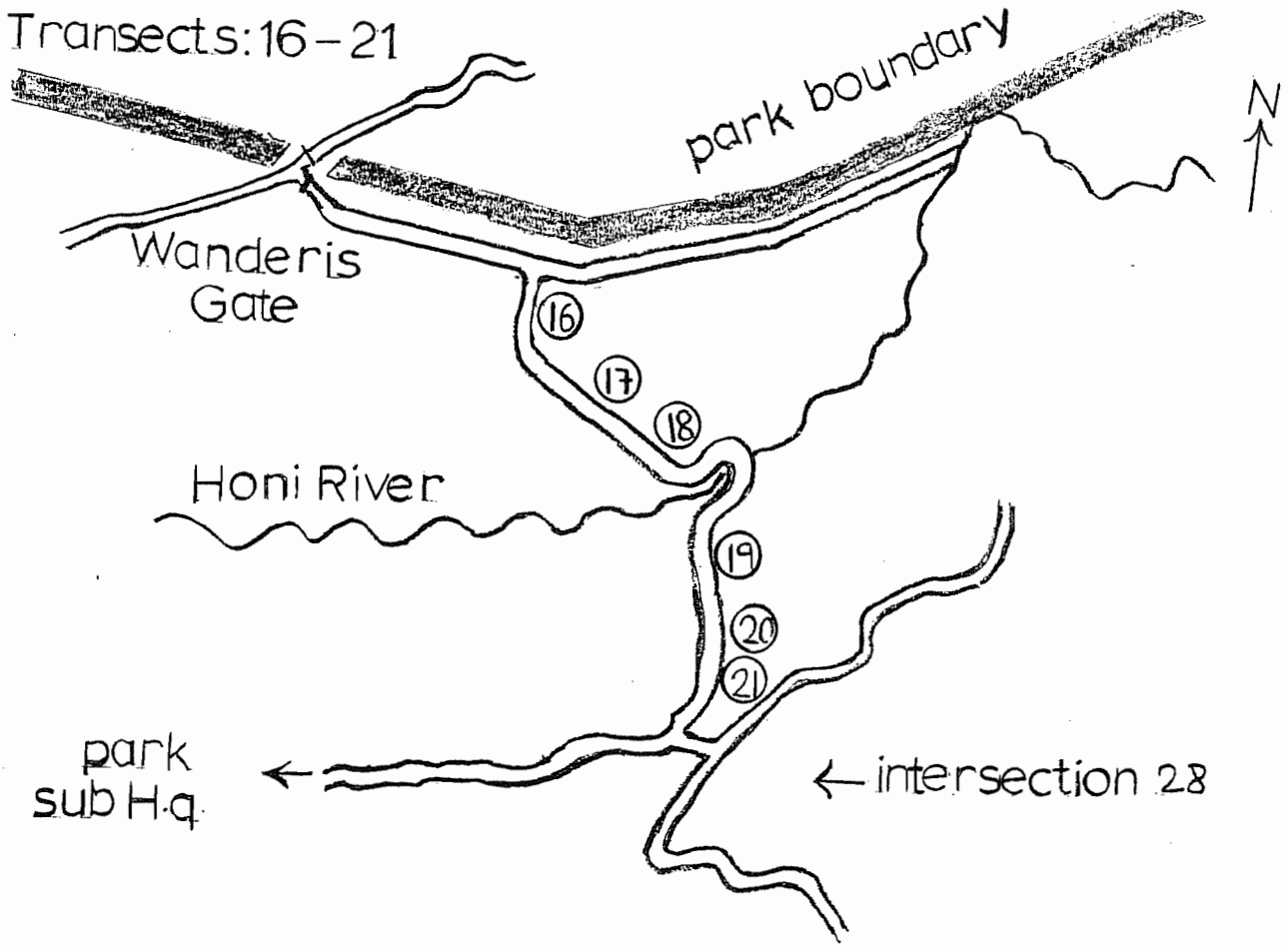
WILDLIFE FENCE STUDY, KENYA (1997-98)

(See Table 17 and Map 19)

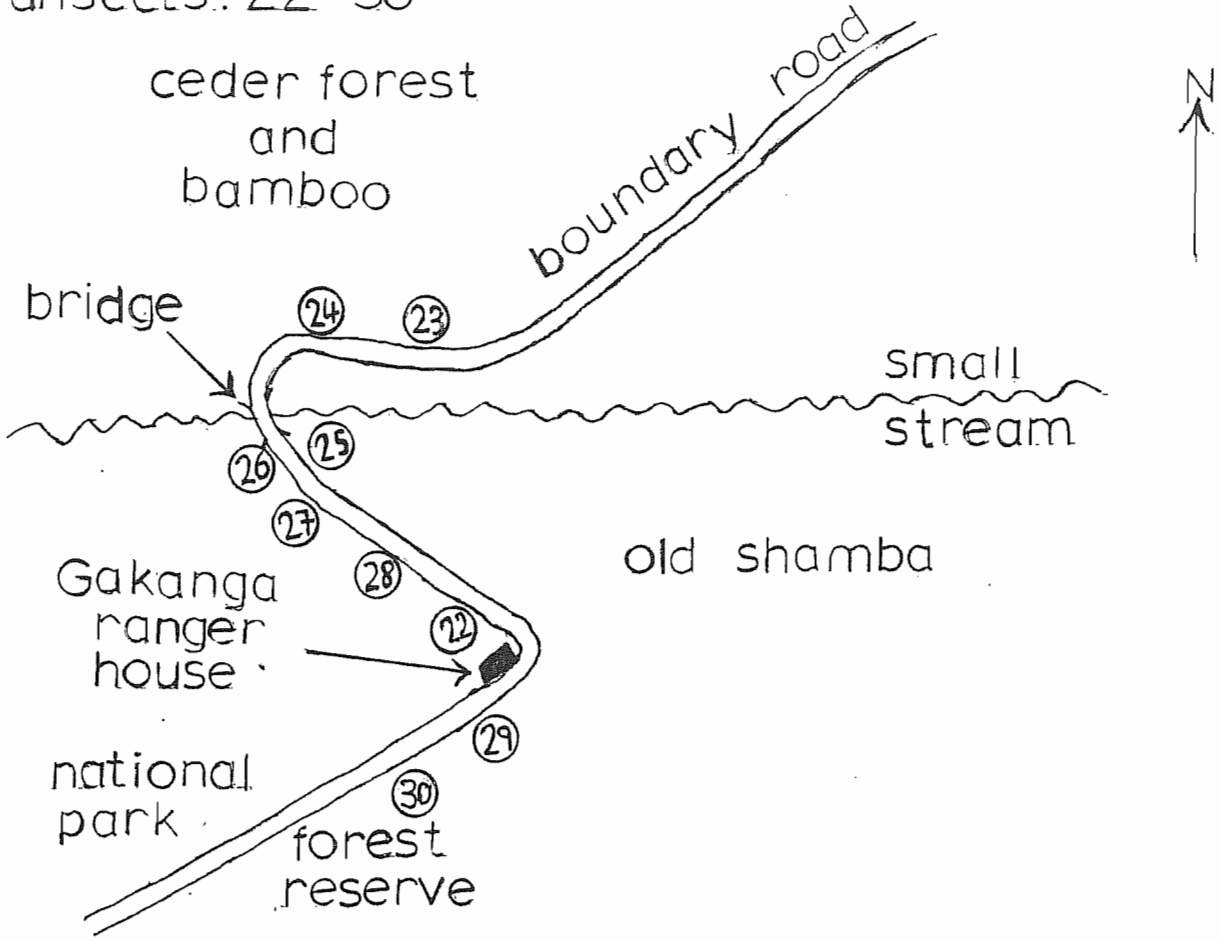

Transects: 1-7
Ruhuruini Gate
N
ranger houses
river
park boundary
bridge
Ruhuruini Camp
wildlife fence
Kinaini River
Nyeri
1
2
3
4
5
6
7


Transects: 8-12
rangers camp
park boundary
N
banda
K1
K2
8
9
10
11
12
300m
300m
TreeTops Gate
gate
to Nyeri
TreeTops Lodge
m1-m5

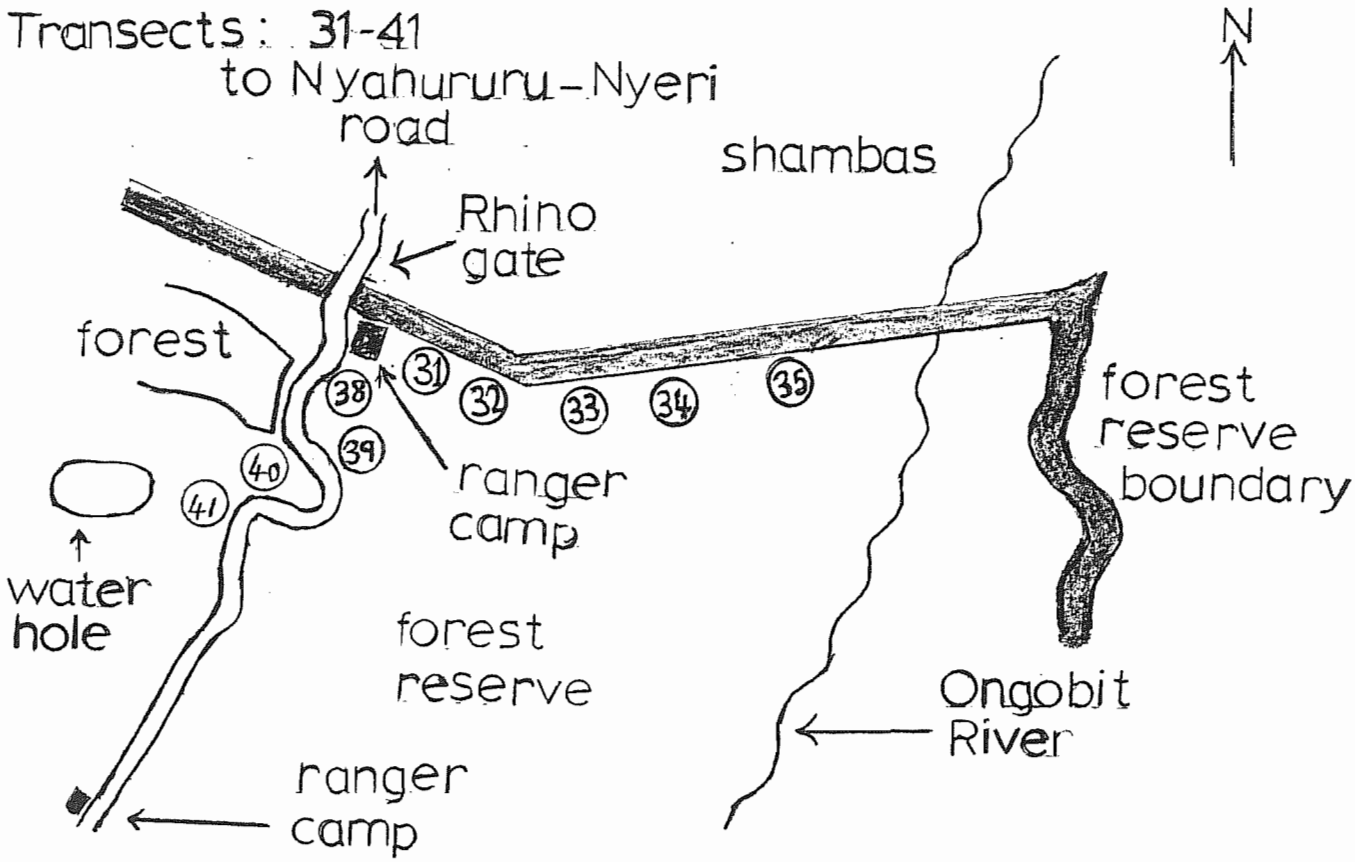

Transects: 13–15
N
park boundary
K2
K1
to TreeTops Gate
13
3
intersection nos.
400m
14
7
15
Treetops Lodge


Transects: 16–21
park boundary
N
Wanderis Gate
16
17
18
Honi River
19
20
21
park sub H.q
intersection 28

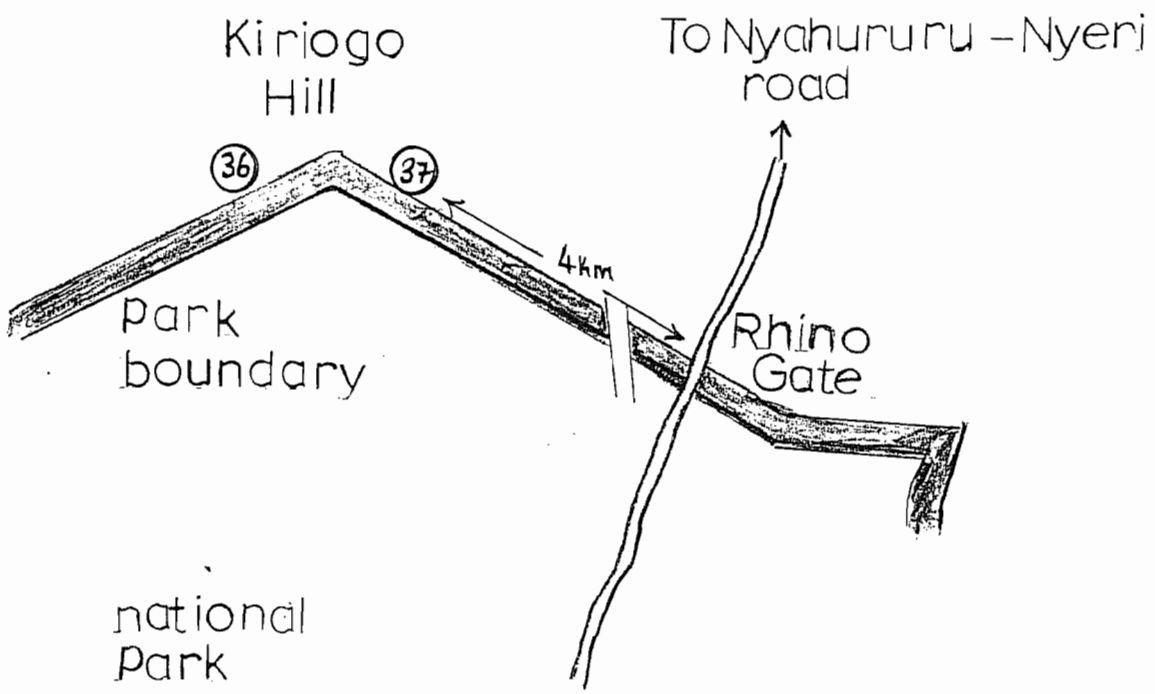
Transects: 22–30



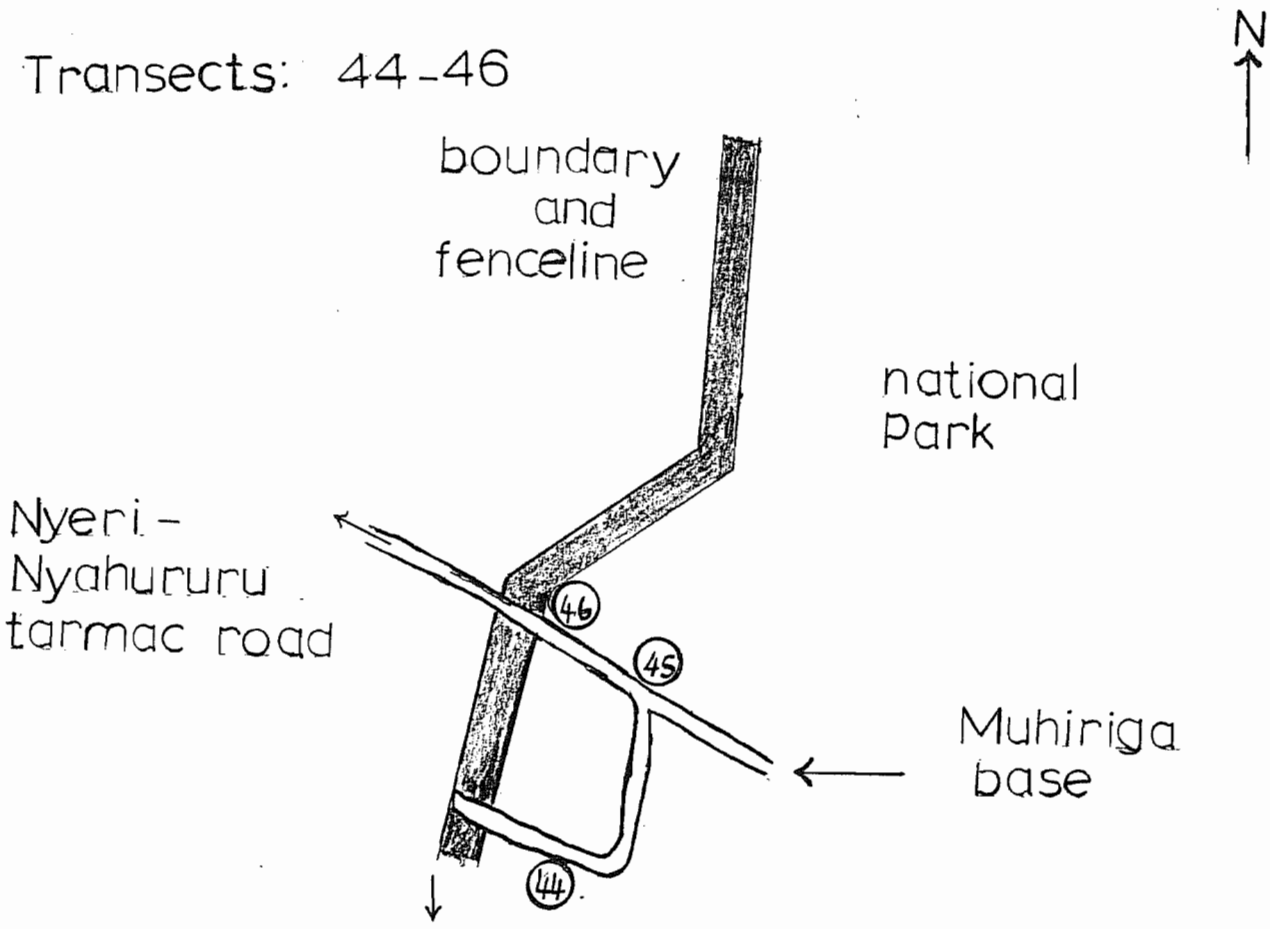
Transects: 31-41



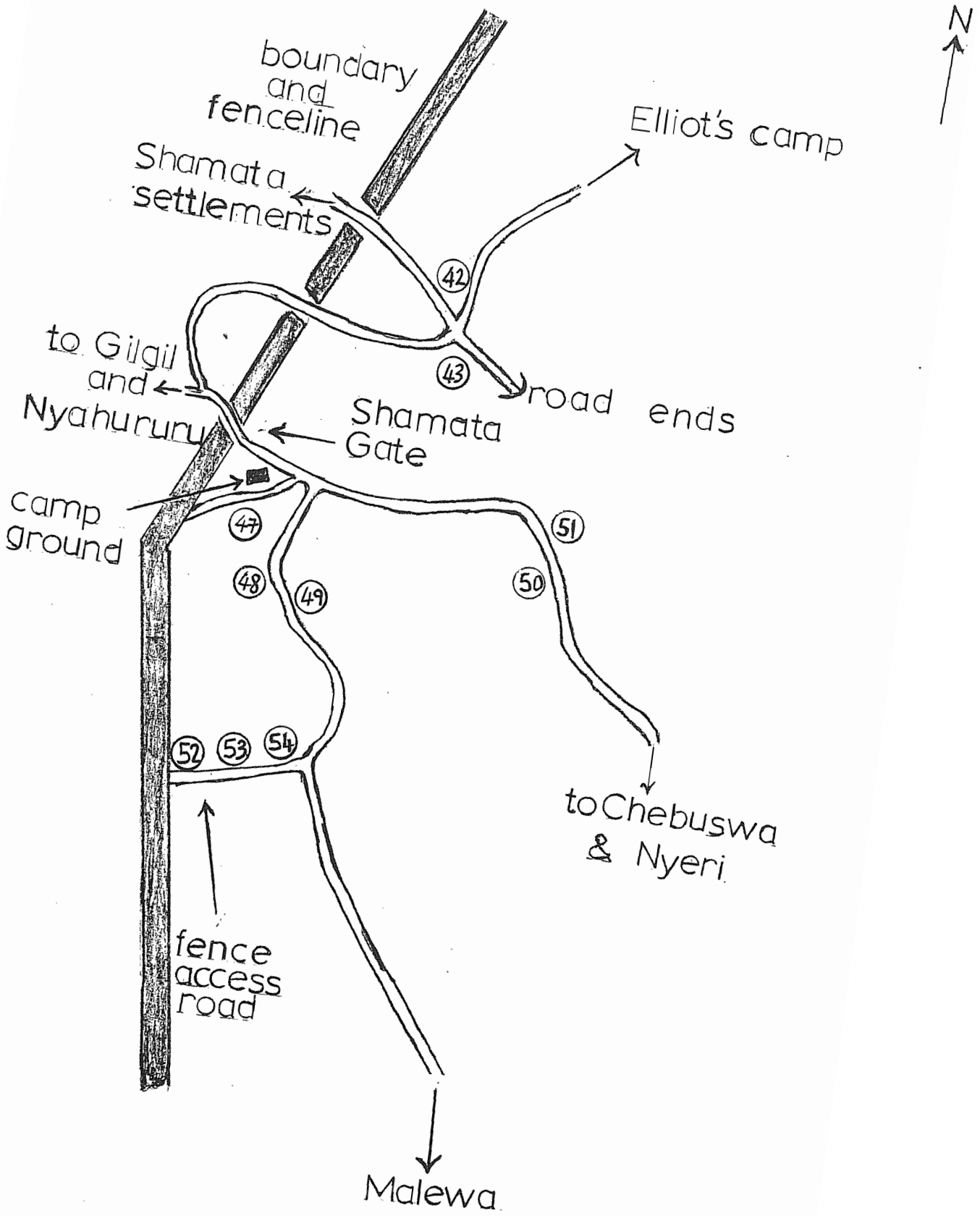
Transects: 36-37



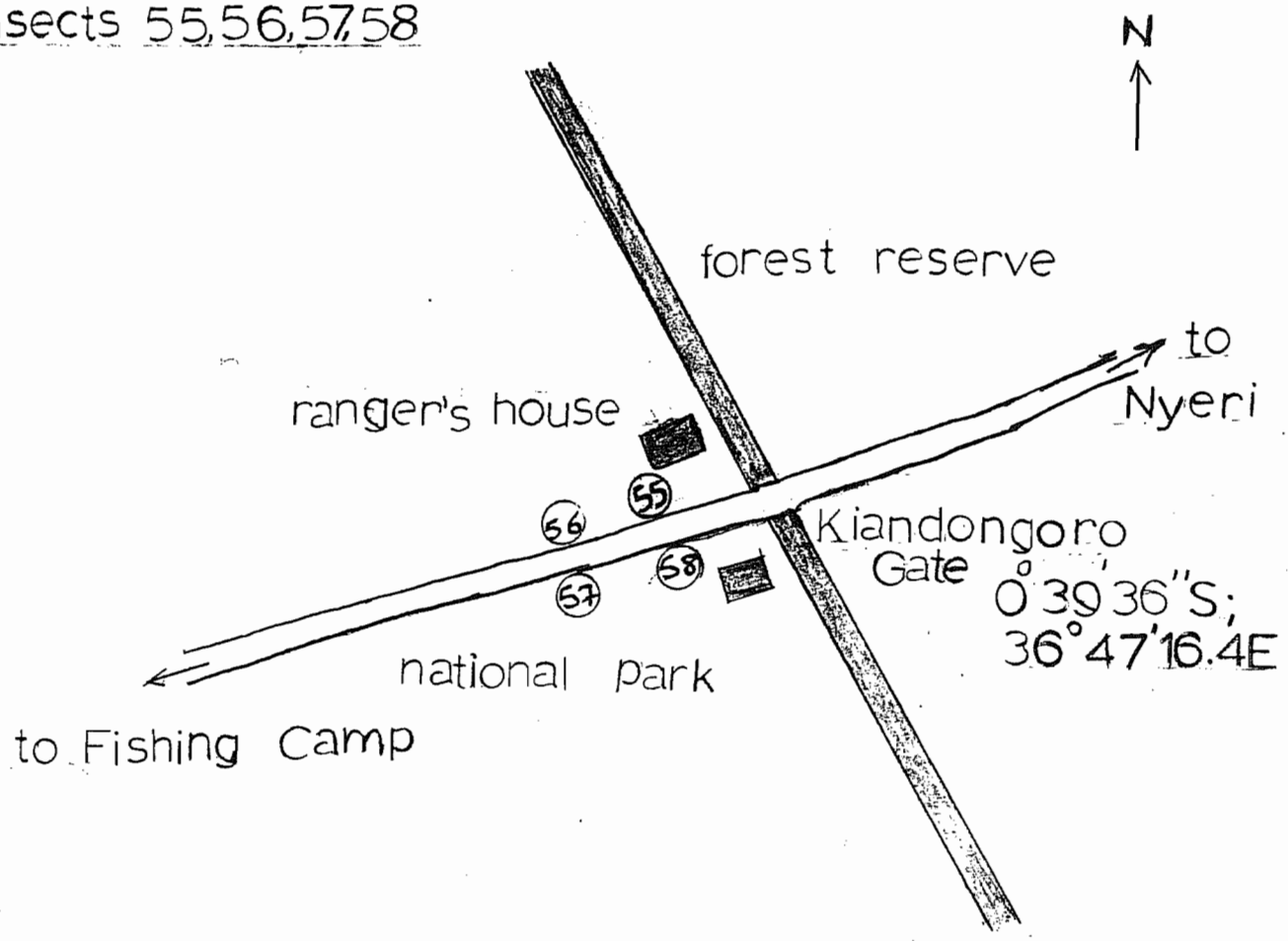
Transects: 44-46



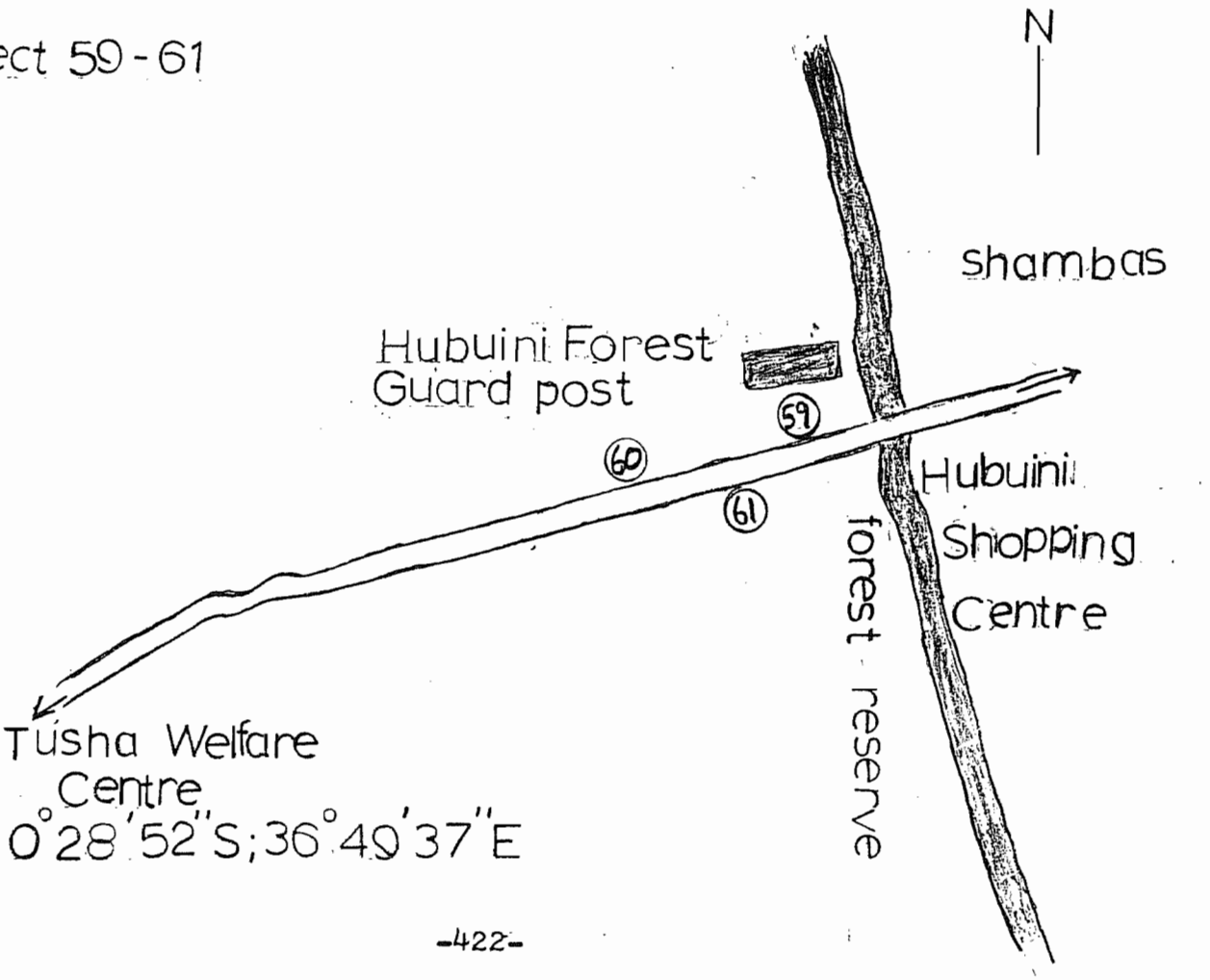
Transects: 42-43 .47-54



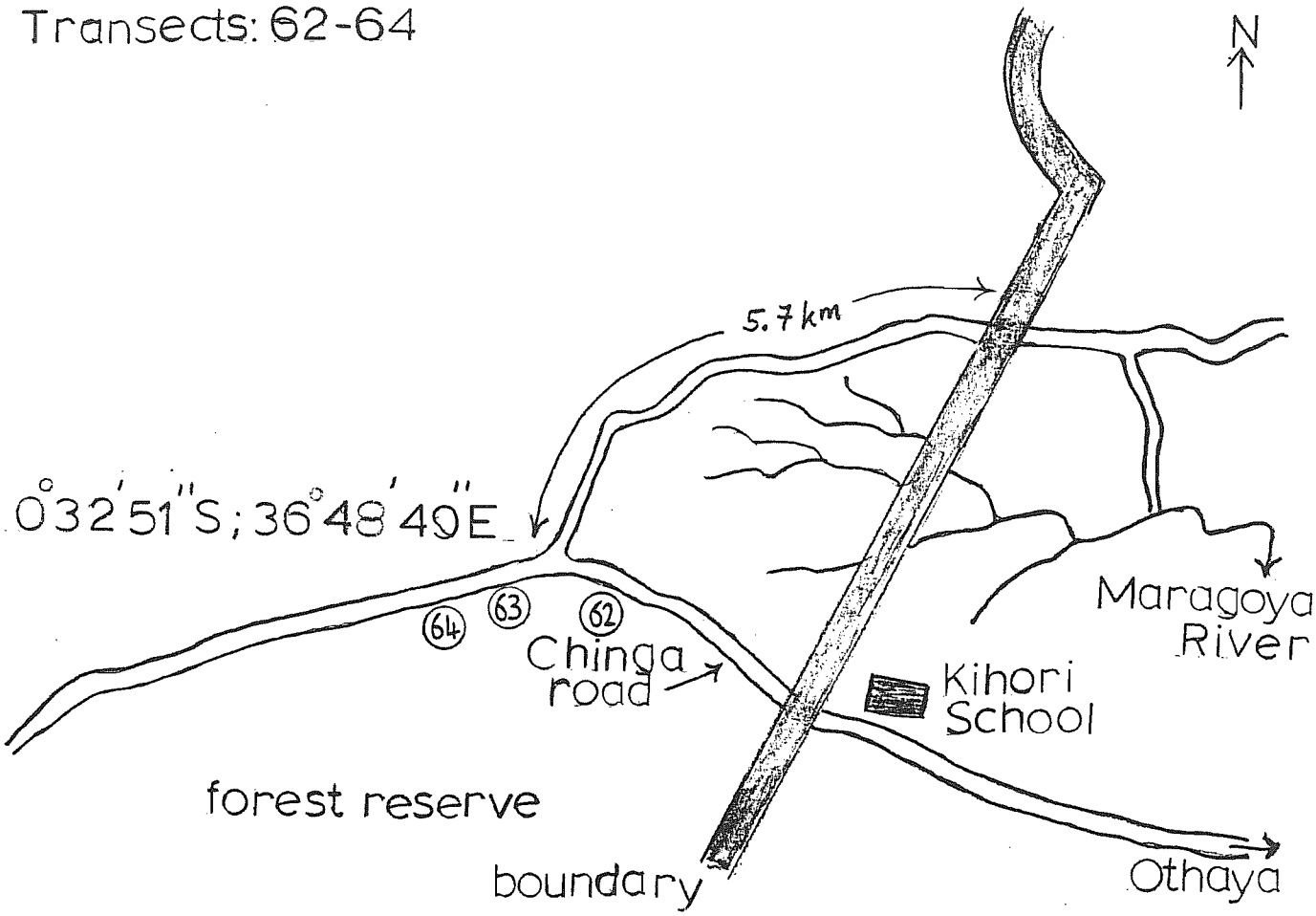
Transects 55,56,57,58



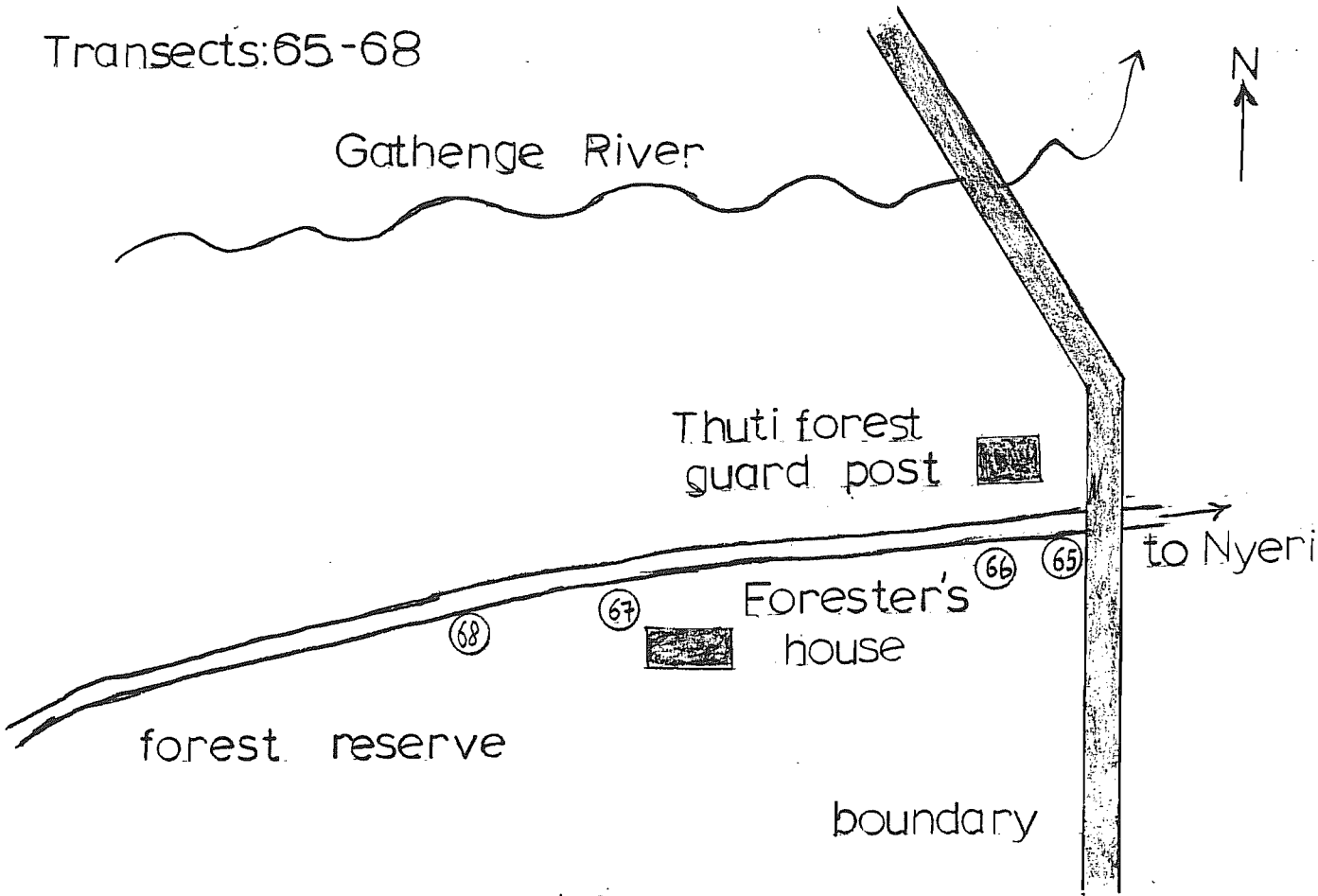
Transect 59-61

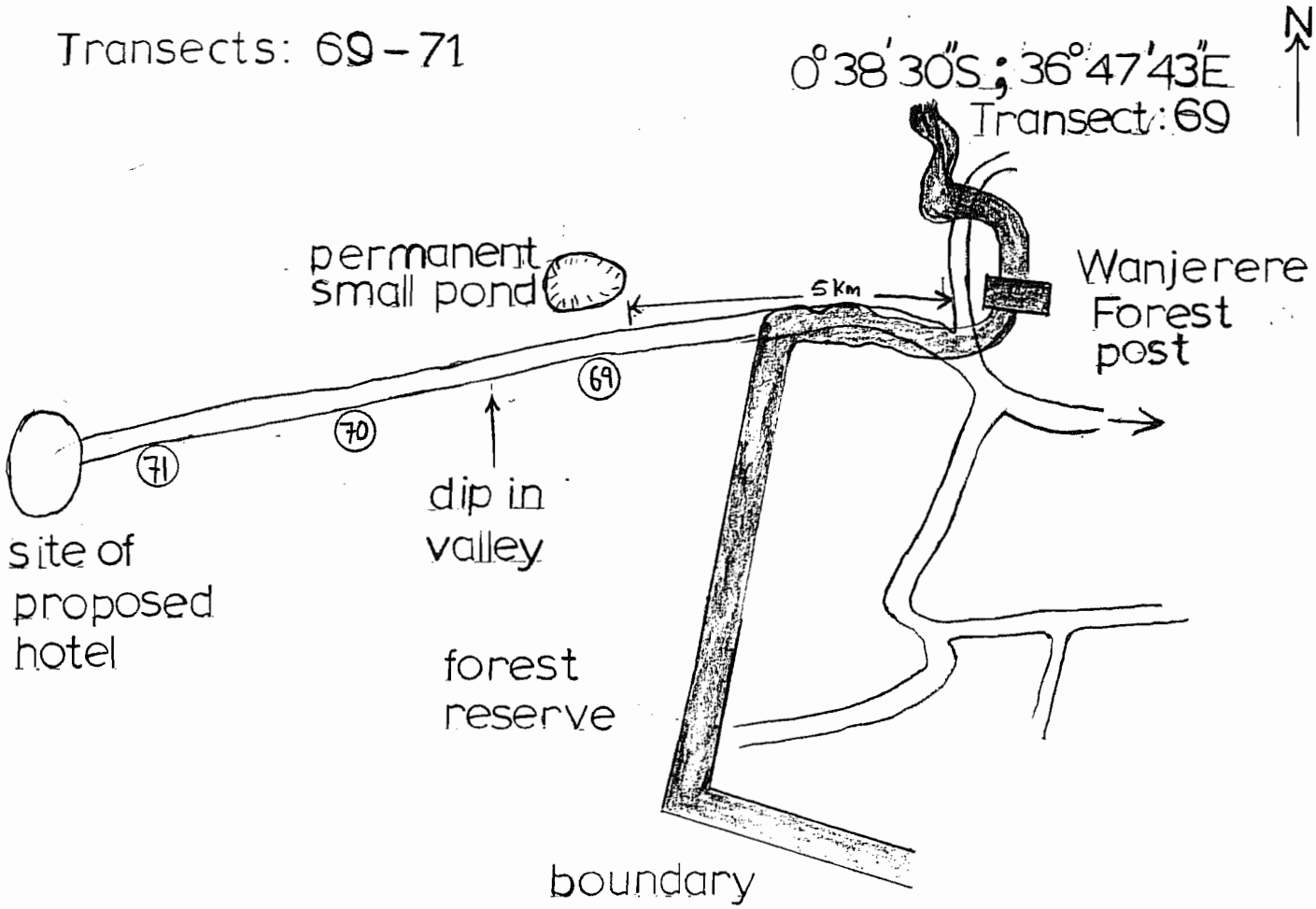


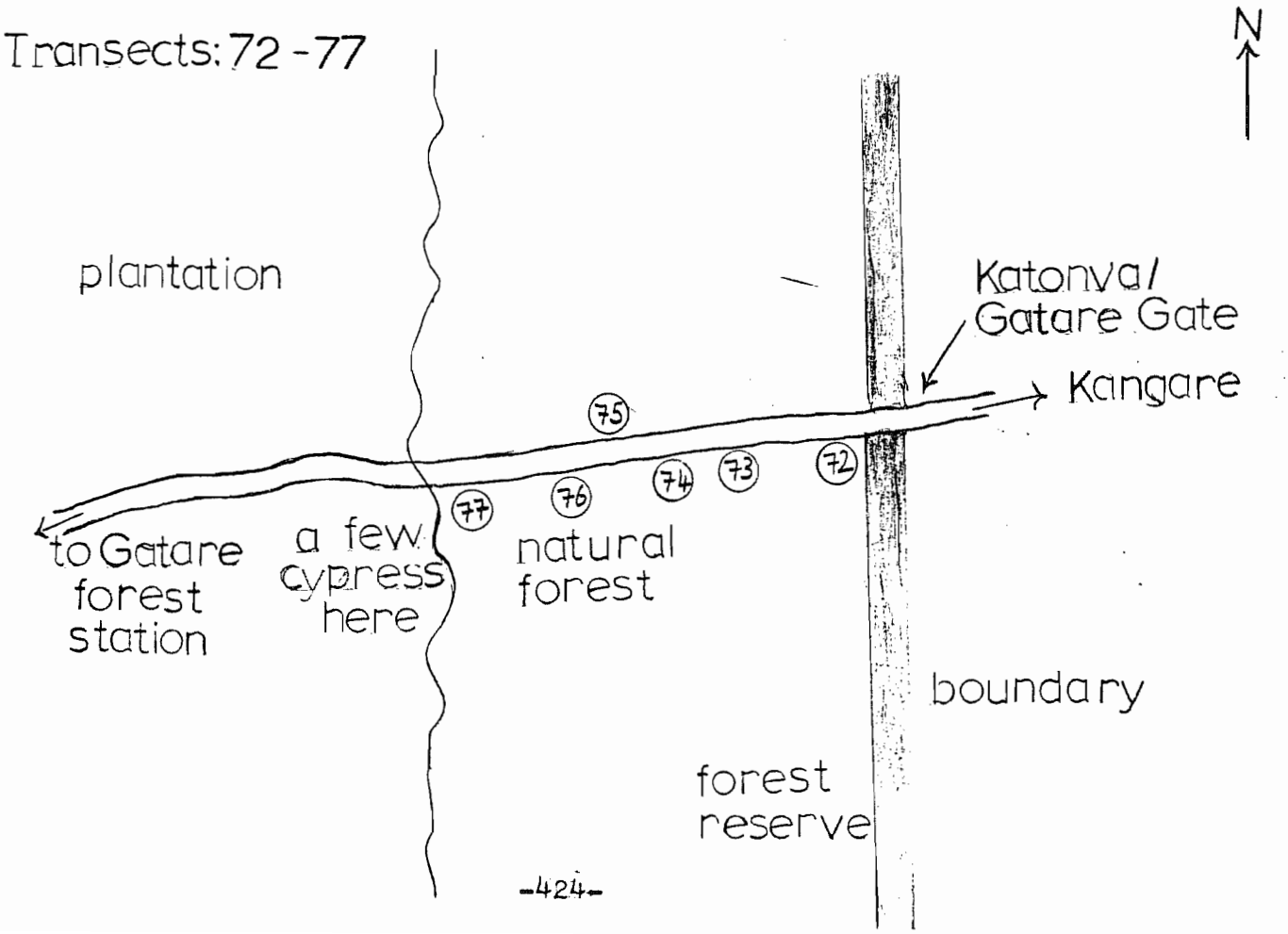
Transects: 62-64



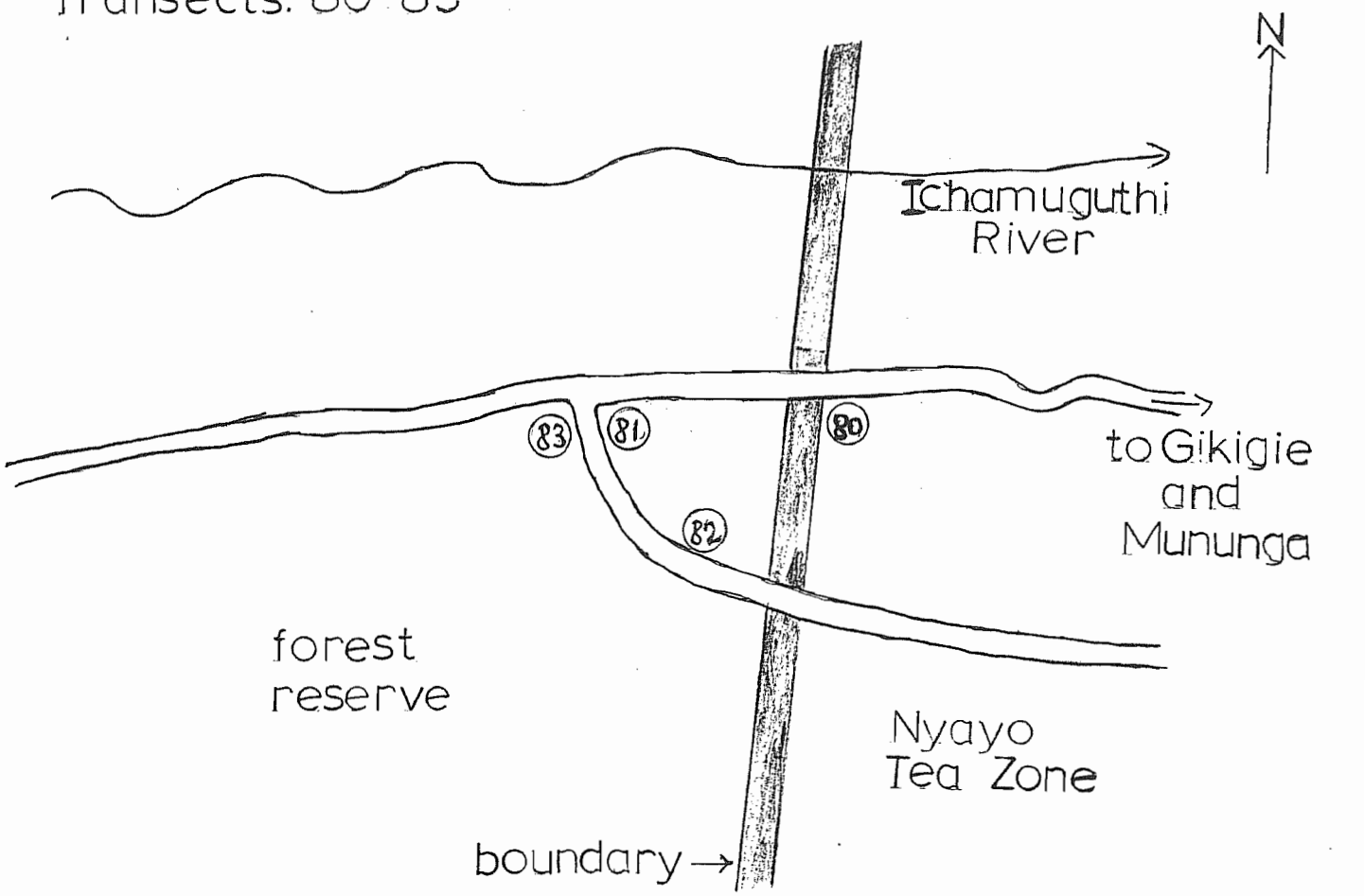
Transects: 65-68



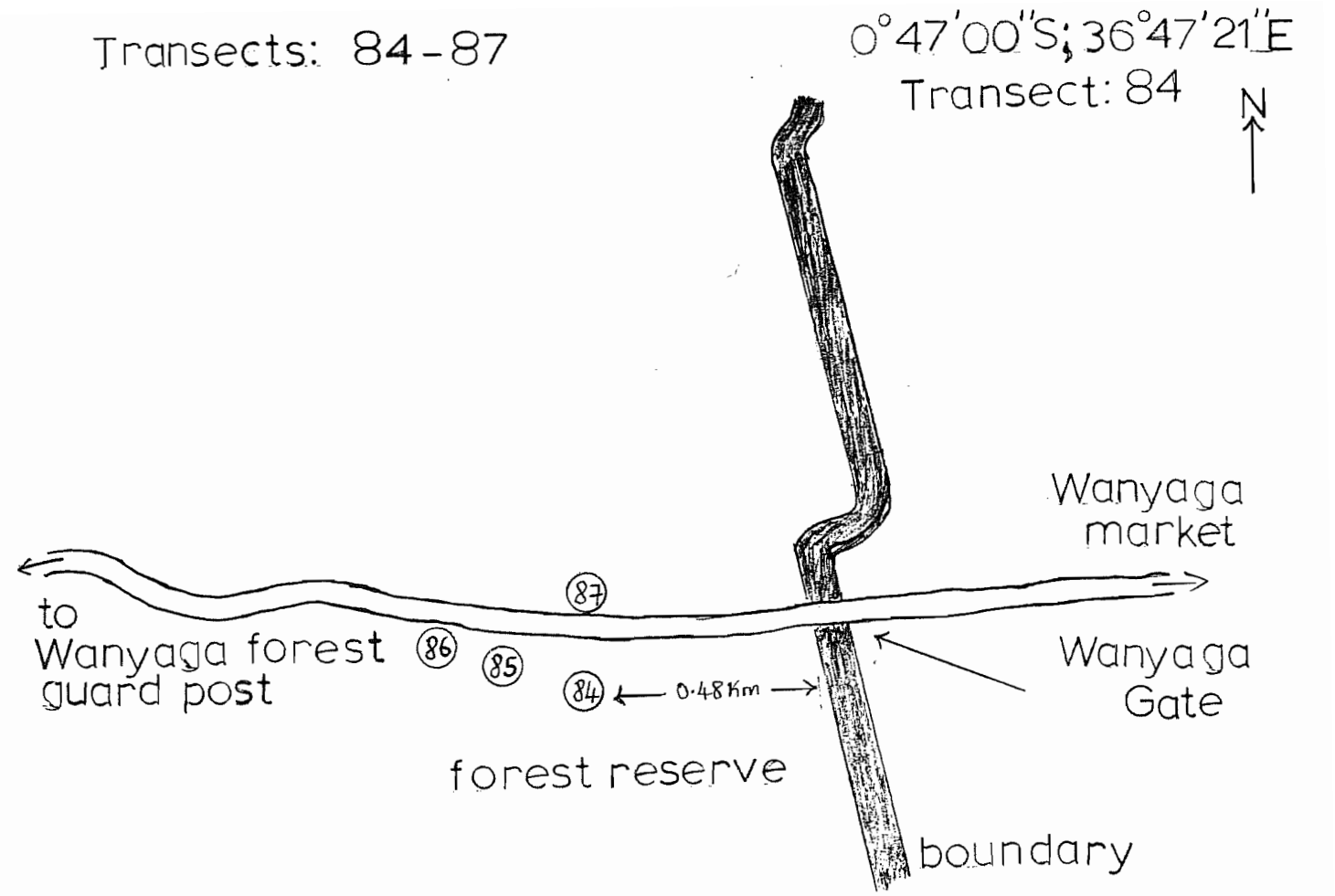

Transects: 69 - 71
0°38'30"S ; 36°47'43"E
Transect: 69
N
permanent small pond
5km
Wanjerere Forest post
69
70
71
dip in valley
site of proposed hotel
forest reserve
boundary

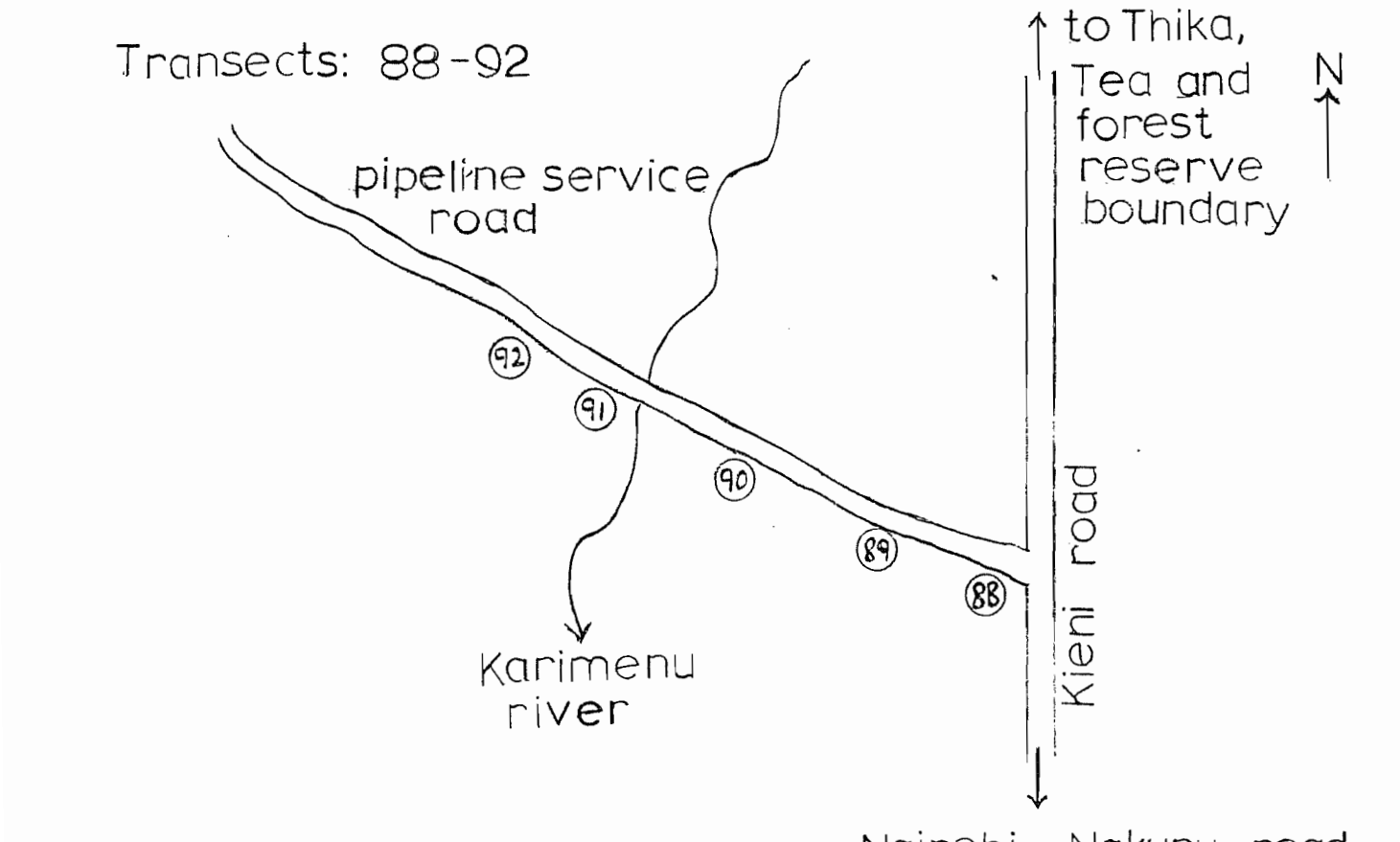

Transects: 72 - 77
N
plantation
Katonva/ Gatare Gate
Kangare
75
72
73
74
76
77
to Gatare forest station
a few cypress here
natural forest
boundary
forest reserve

Transects: 80-83



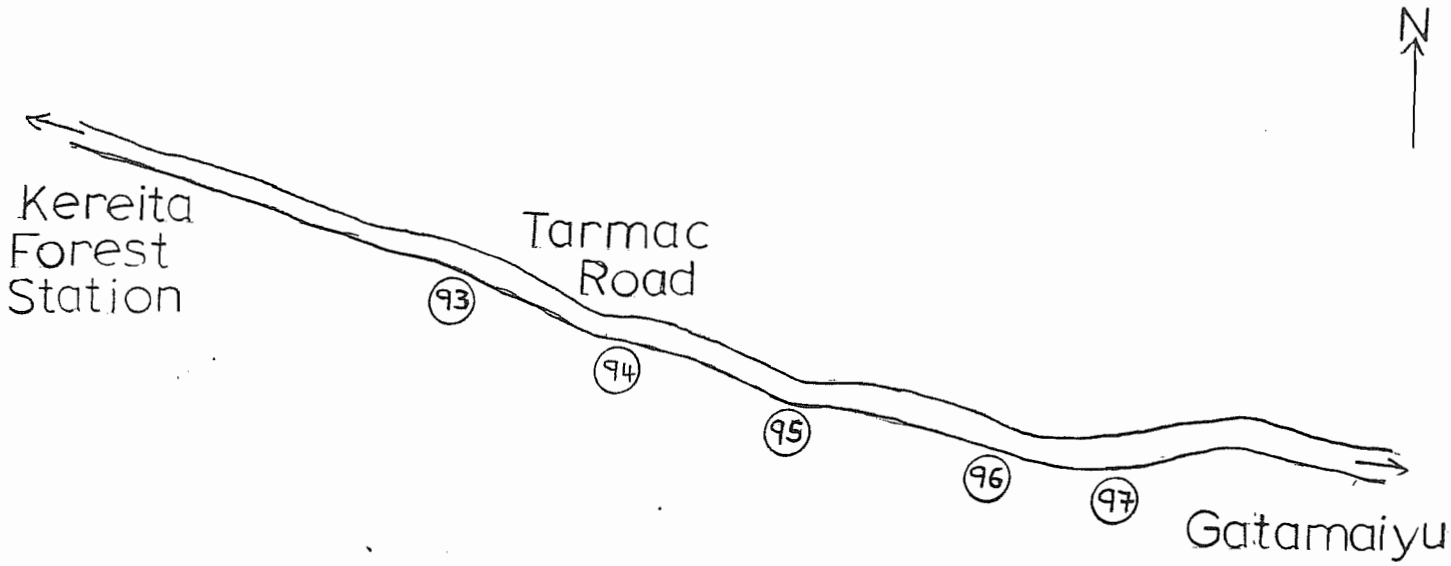
Transects: 78-79 Along road just NW of Gatare forest station
(0°42' 53"S; 36°44' 55"E)
In bamboo and open herbage near pine plantation


Transects: 84-87
0°47'00"S; 36°47'21"E
Transect: 84
N
Wanyaga market
to Wanyaga forest guard post
87
86
85
84
0.48km
Wanyaga Gate
forest reserve
boundary

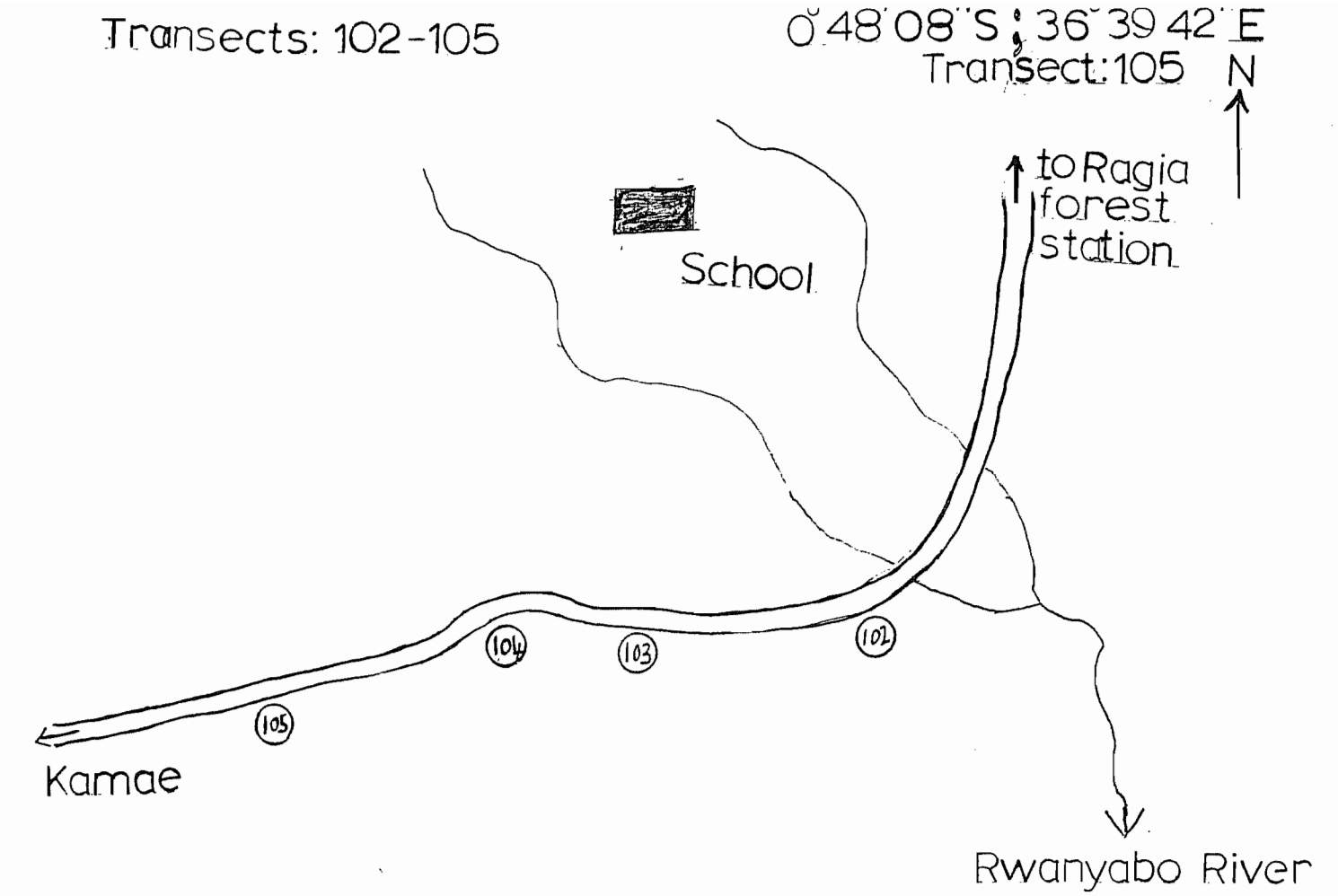

Transects: 88-92
to Thika, Tea and forest reserve boundary
N
pipeline service road
92
91
90
89
88
Karimenu river
Kieni road
Nairobi – Nakuru road

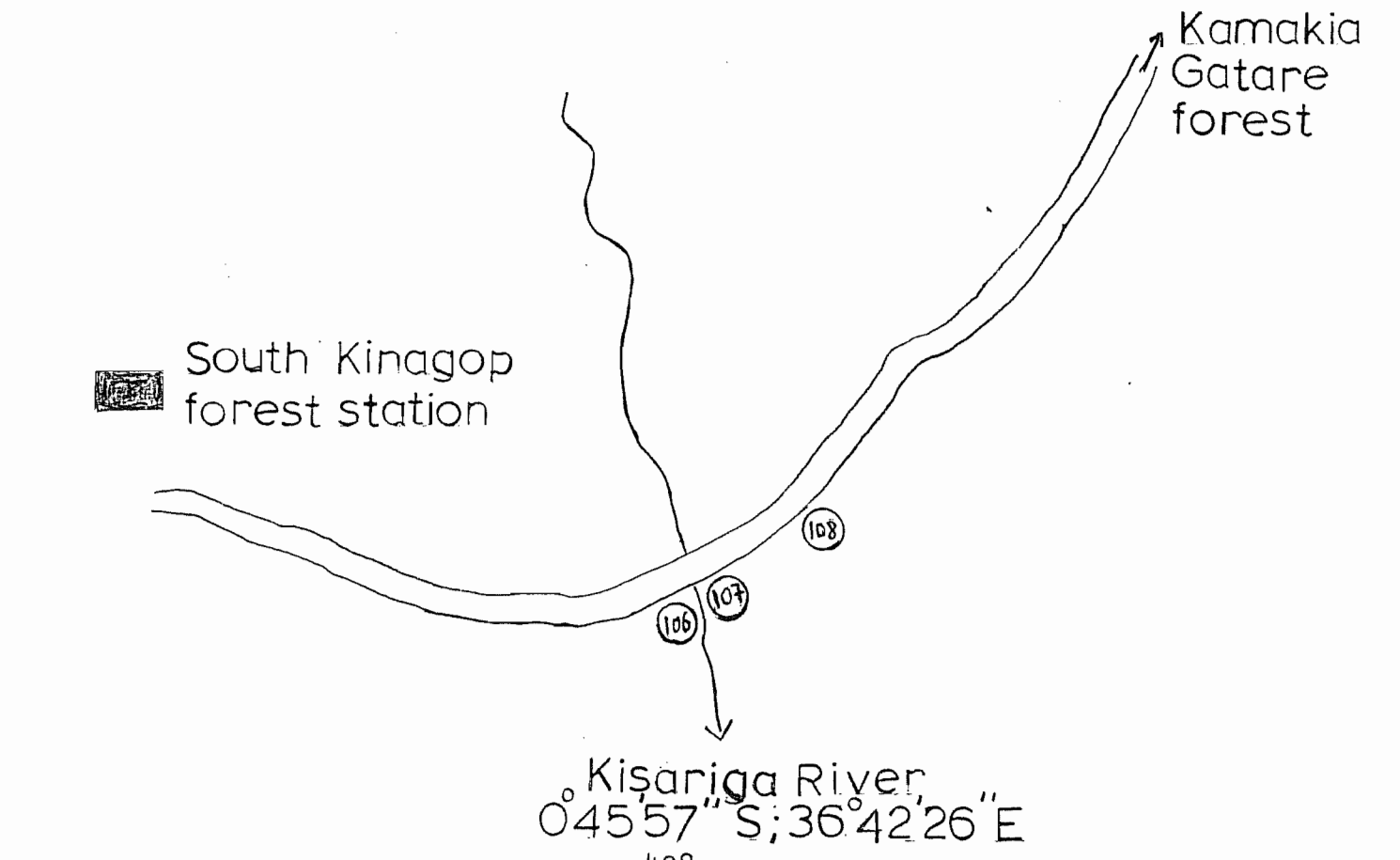
Transects: 93 – 97

Transect 93 0·3km East of,
0°57'75"S; 36°39'28"E

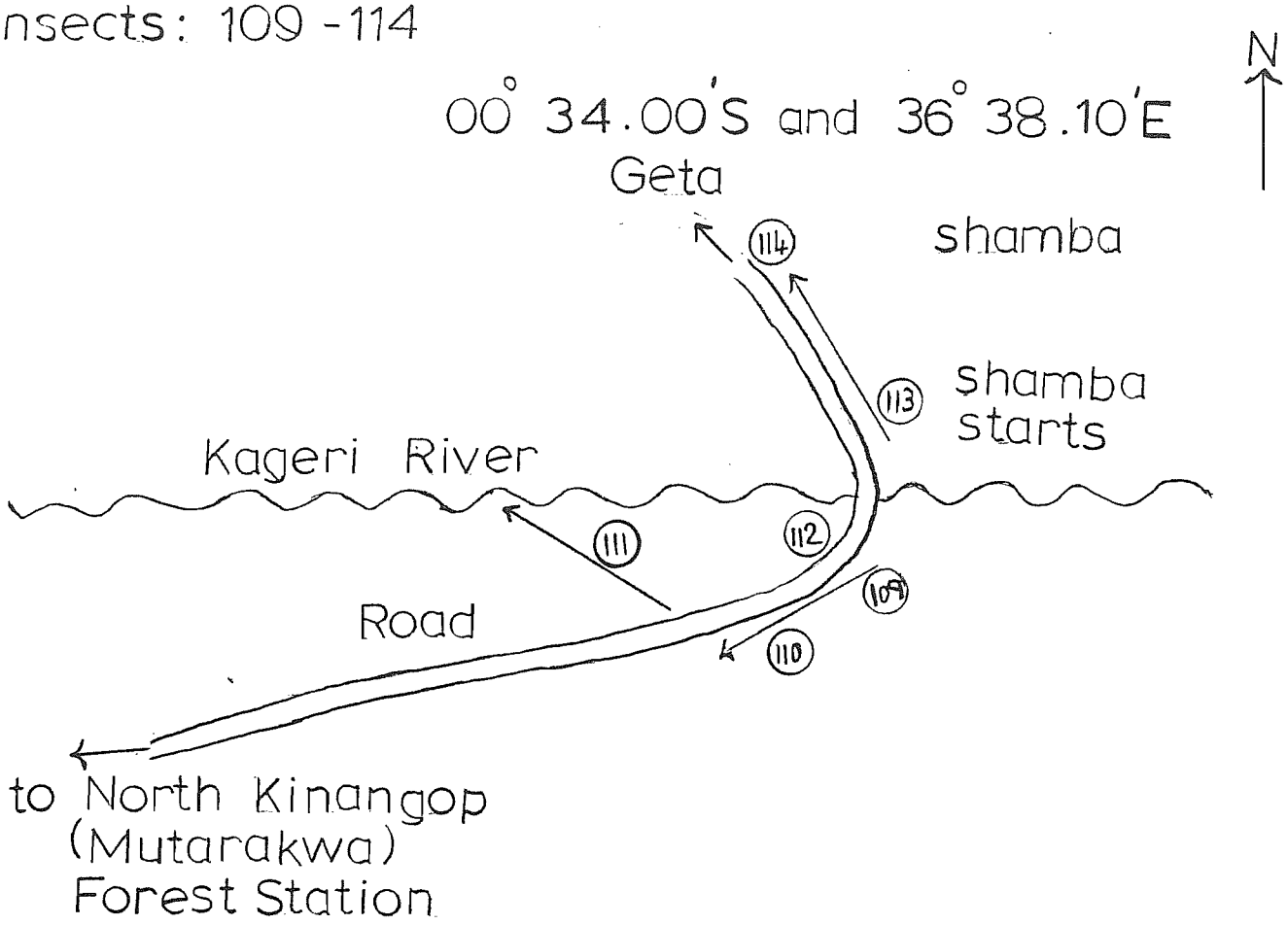


Transects: 98 – 101 on old logging road south of Kieni forest station with 98 at 0°52'20"S; 36°41'08"E

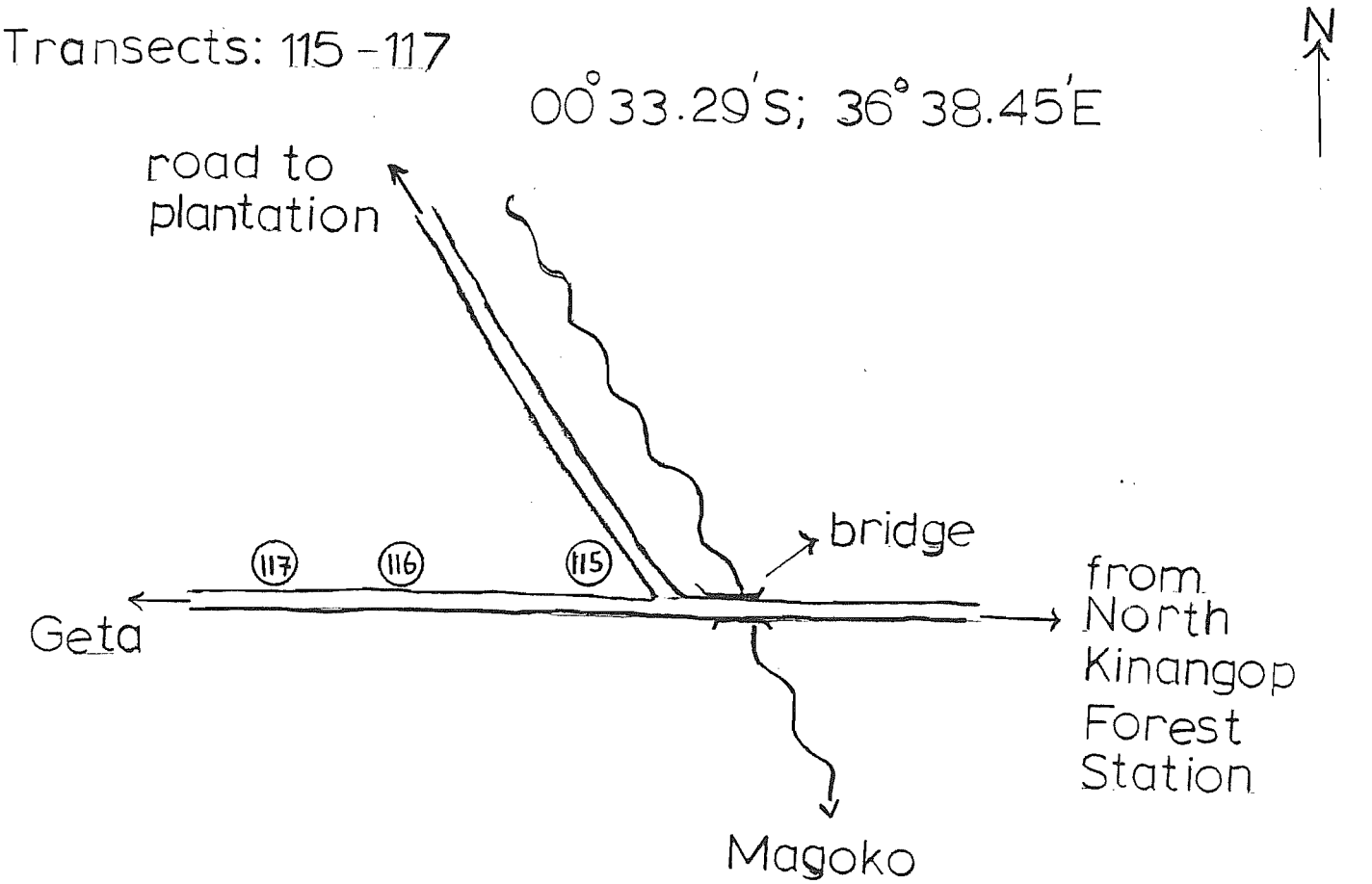

Transects: 102-105
0°48'08"S; 36°39'42"E
Transect: 105
N
to Ragia forest station
School
104
103
102
105
Kamae
Rwanyabo River


Transects: 106-108
Kamakia Gatare forest
South Kinagop forest station
108
107
106
Kisariga River
0°45'57"S; 36°42'26"E

Transects: 109 -114

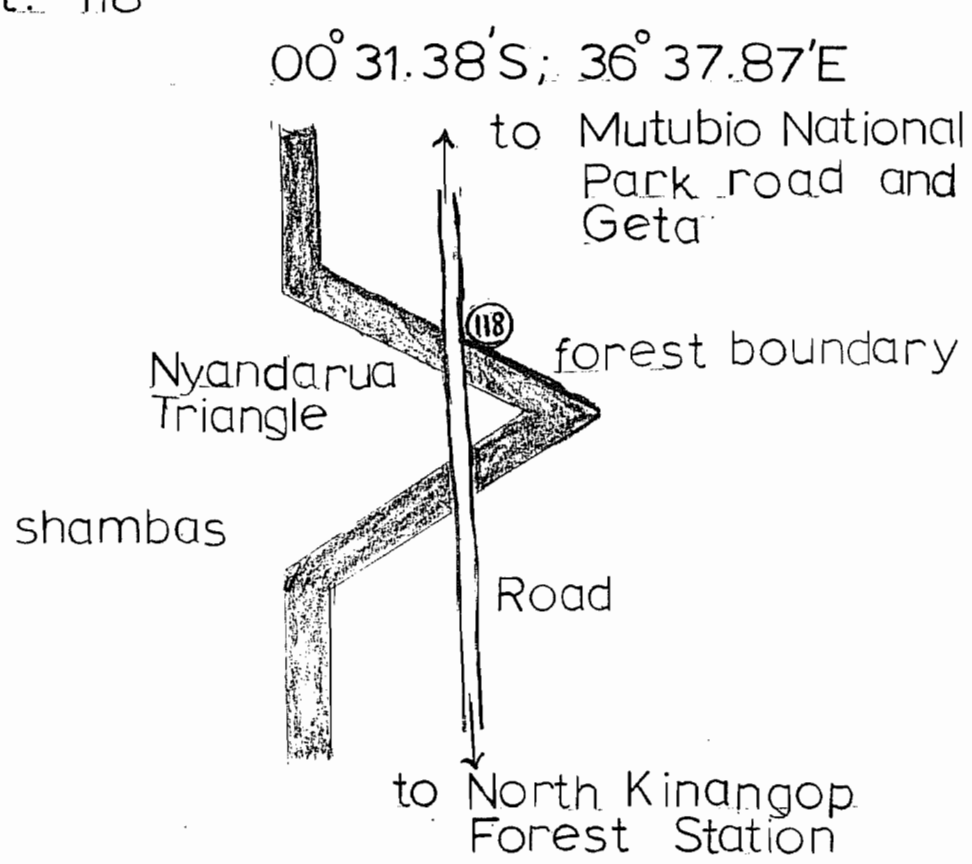


Transects: 115 -117



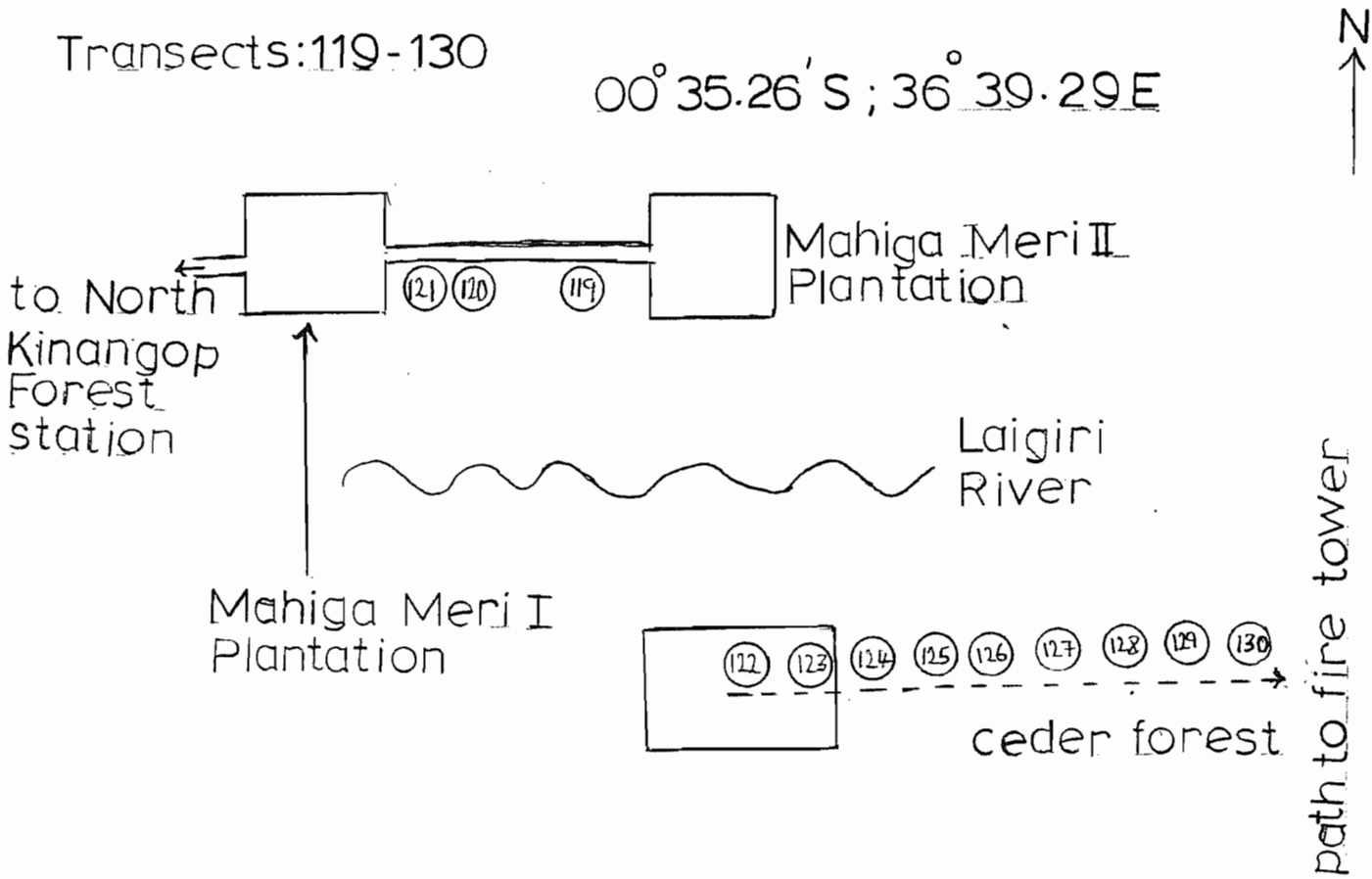
Transect: 118

00° 31.38'S; 36° 37.87'E



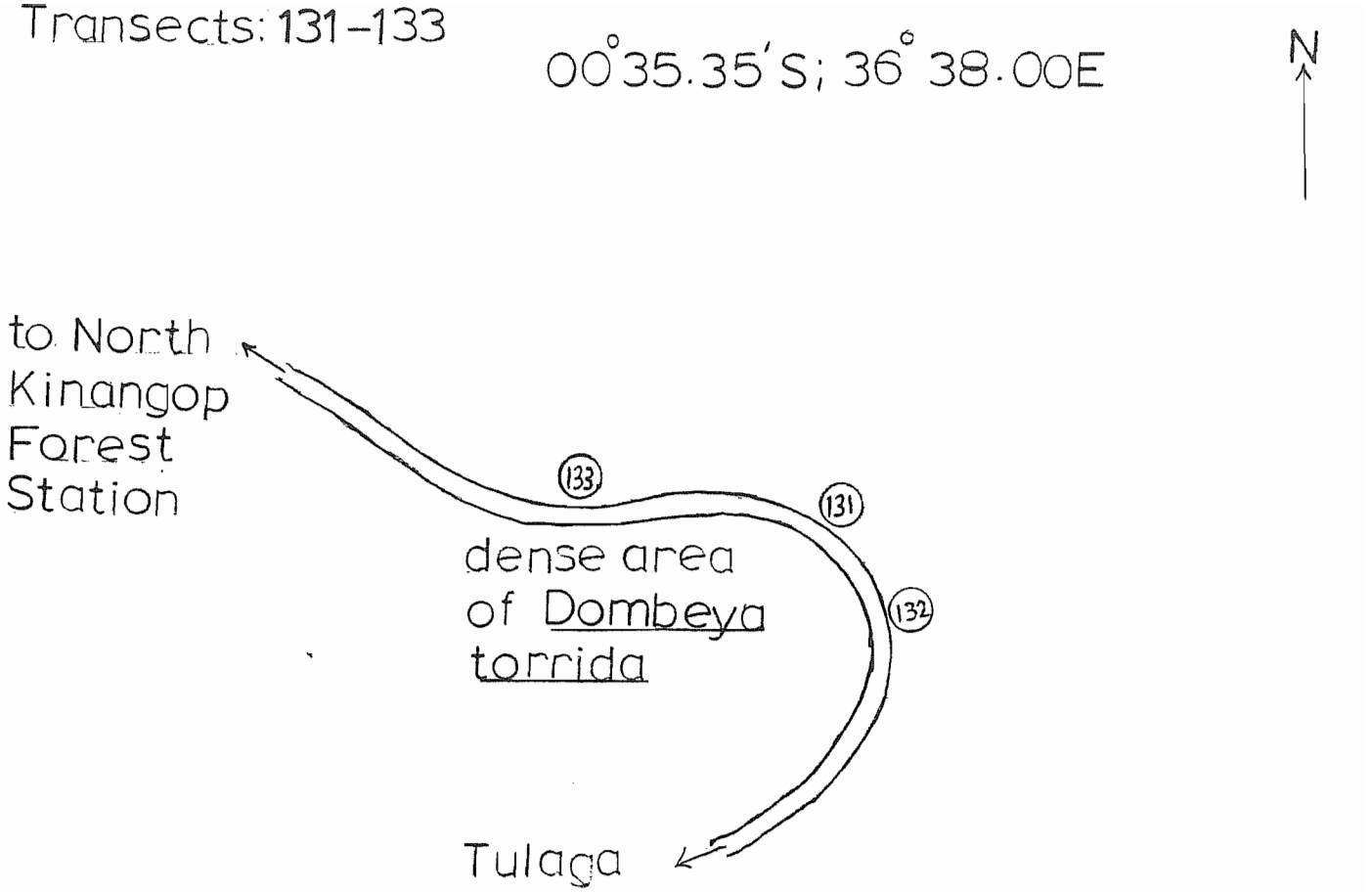
Transects: 119-130

00° 35.26'S; 36° 39.29E

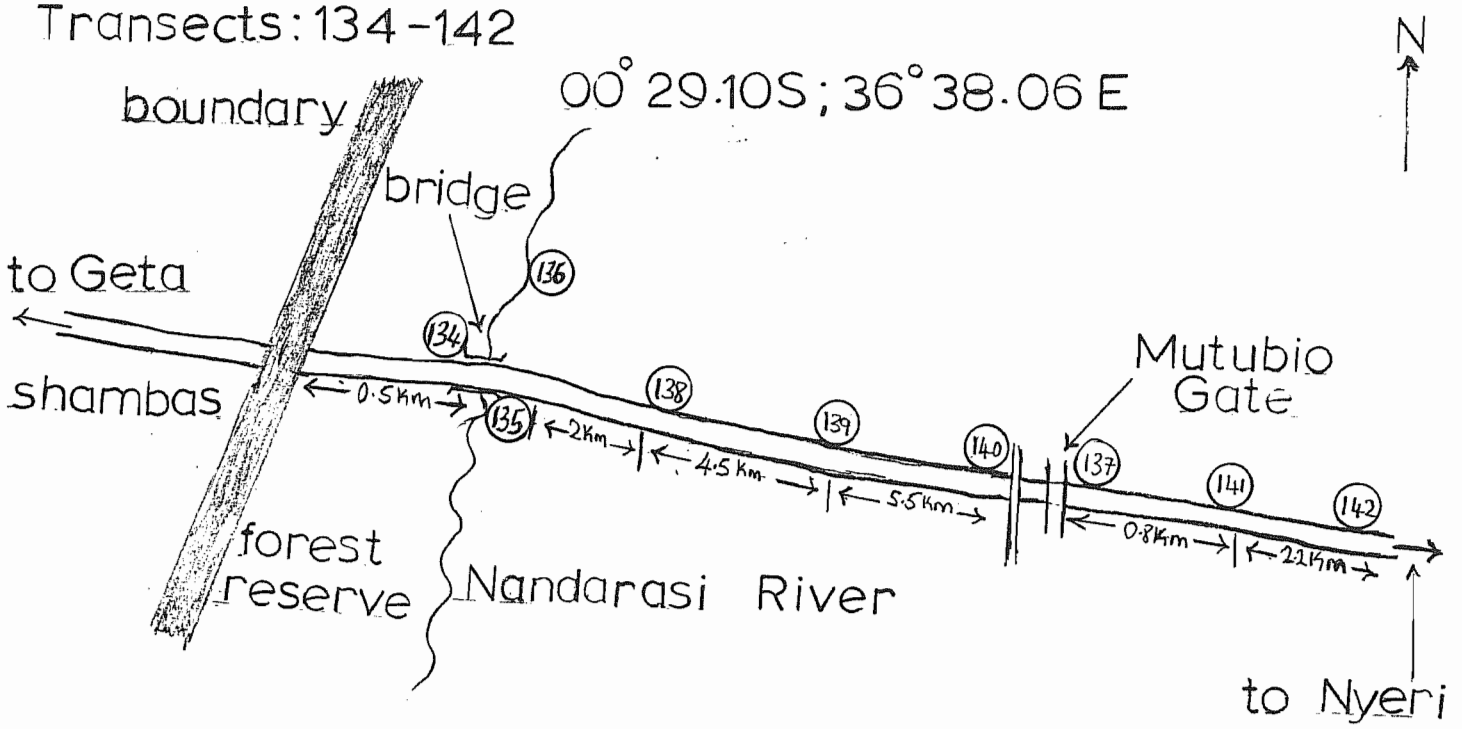


Transects: 131–133

00°35.35'S; 36° 38.00E



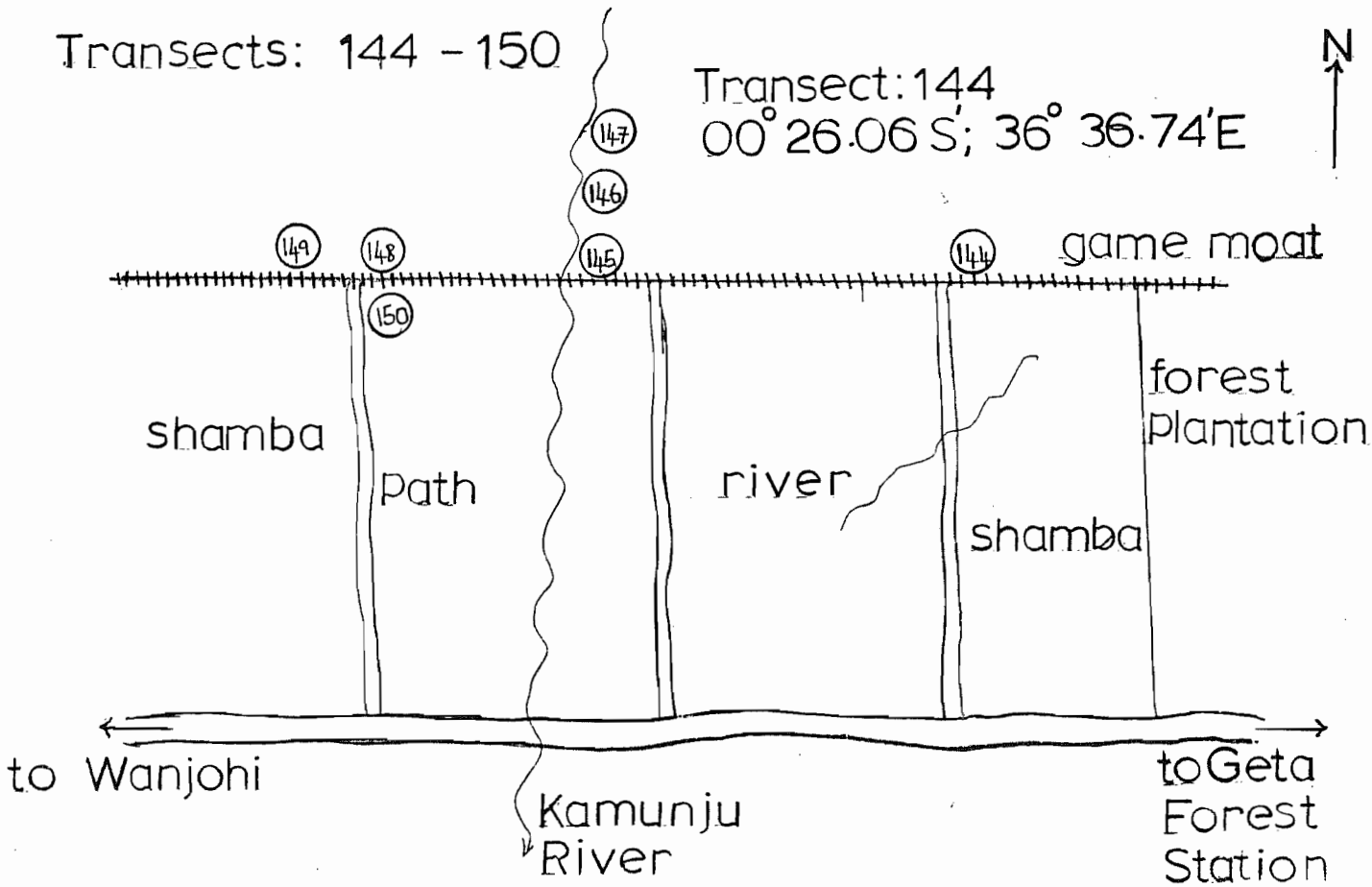
Transects: 134–142



Transect: 143 at parking lot at Karuru Falls

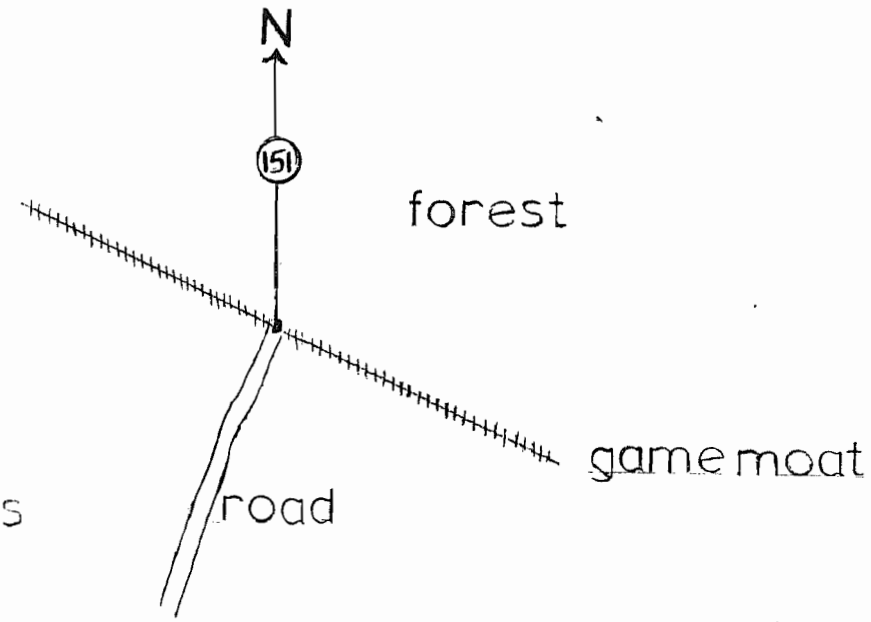
00° 31.33'S; 36° 43.15'E

Transects: 144 - 150



Transect: 151

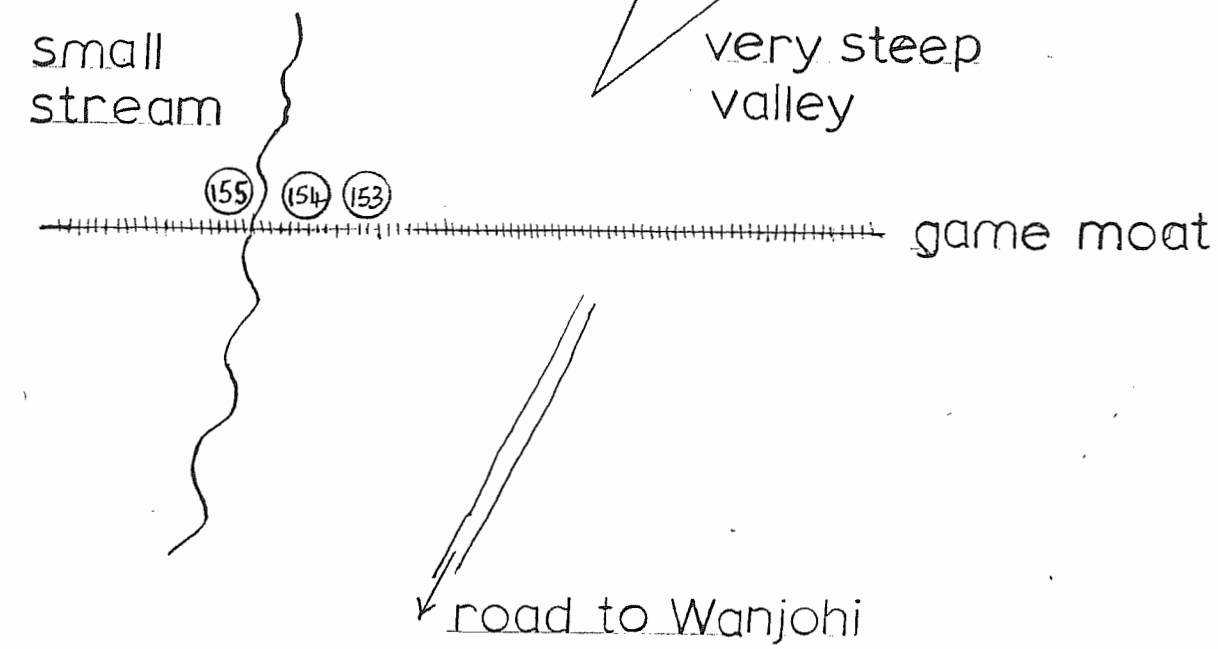
00° 23.00'S; 36° 34.24'E



Transect: 152 near Wanjohi Town at 00° 21.09'S; 36° 33.12'E

Transects: 153 - 155

Transect: 153
00° 19.50' S;
36° 32.37 E



Transects: 156 - 158

00° 18.53' S
36° 32.02' E

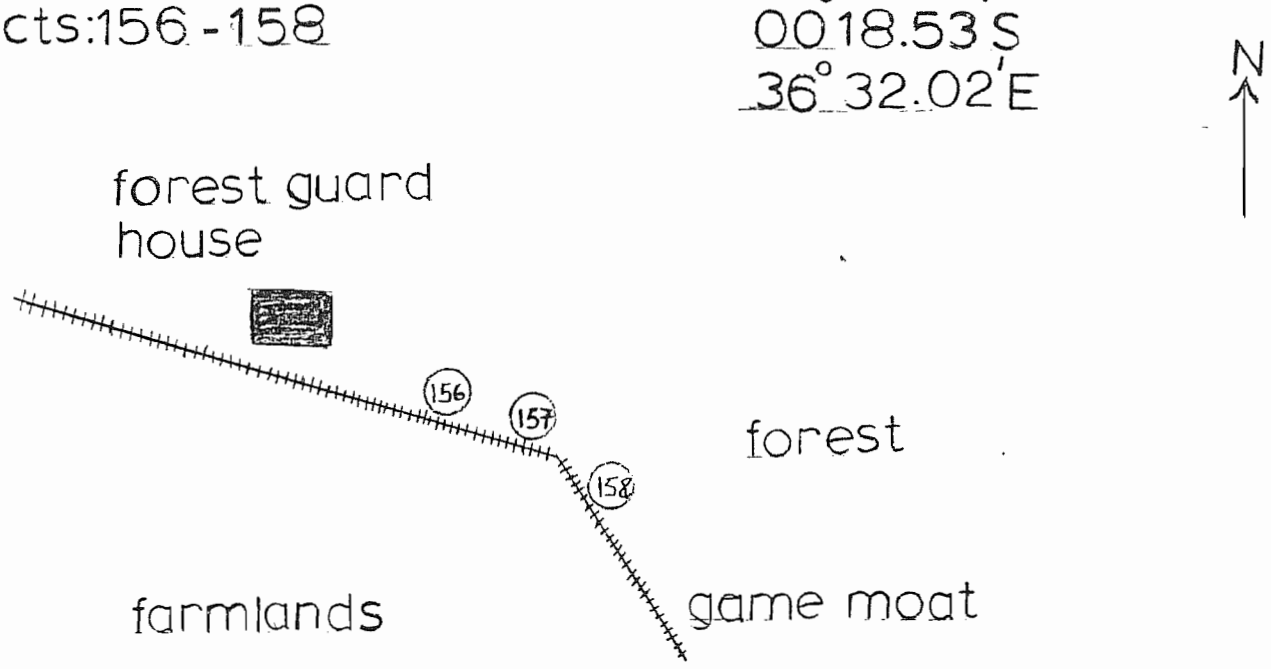


Table 26. Medium and large mammals of the Aberdares ecosystem, Kenya. Original list compiled by Blom *et al.* (1990). Additional data from Williams (1981), Sillero-Zubiri and Gottelli (1992), and Butynski (unpubl. data). Except for the primates and pigs, all common and scientific names according to EANHS (1994).

Species	Zone	Status
Giant White-toothed Shrew *Crocidura sp.*	?	?
Aberdare Mole Shrew *Surdisorex norae*	?	?
Egyptian Fruit Bat *Rousettus aegyptiacus*	?	?
Banana Bat/African Pipistrelle *Pipistrellus nanus*	?	?
Small-eared Greater Galago *Otolemur garnettii*	D*	XX*
Senegal Galago *Galago senegalensis*	A	XX*
Vervet Monkey *Cercopithecus aethiops*	A	X*
Syke's Monkey *Cercopithecus albogularis*	ACD*	XXX*
Olive Baboon *Papio anubis*	AC*	XX*
Black-and-white Colobus *Colobus guereza*	ACD*	XXX*
Side-striped Jackal *Canis adustus*	?	?
Golden Jackal *Canis aureus*	?	?
Black-backed Jackal *Canis mesomelas*	A	?
Hunting Dog *Lycaon pictus*	?	?
African Clawless Otter *Aonyx capensis*	A	?
Striped Polecat/Zorilla *Ictonyx striatus*	A	?
African Spot-necked Otter *Lutra maculicollis*	?	?
Honey Badger *Mellivora capensis*	A	?
East African Civet *Civettictis civetta*	A	?
Small-spotted Genet *Genetta genetta*	?	?
Servaline Genet *Genetta servalina*	?	?
Rusty Spotted Genet *Genetta tigrina*	A	?
African Palm Civet *Nandinia binotata*	A	?
Marsh Mongoose *Atilax paludinosus*	A	?
Dwarf Mongoose *Helogale parvula*	?	?
Egyptian Mongoose *Herpestes ichneumon*	D*	X*
Slender Mongoose *Herpestes sanguineus*	A	?
White-tailed Mongoose *Ichneumia albicauda*	A	?
Banded Mongoose *Mungos mungo*	A	?
Spotted Hyaena *Crocuta crocuta*	ABCDE*	XX*
African Golden Cat *Felis aurata*	?	?
Caracal *Felis caracal*	?	?
Serval *Felis serval*	E*	XX*
African Wild Cat *Felis silvestris*	?	?

Table 26. (continued).

Species	Zone	Status
Lion *Panthera leo*	ACDE*	XX*
Leopard *Panthera pardus*	ACDE*	XX*
African Elephant *Loxodonta africana*	ABCDE*	XX*
Plain's Zebra *Equus burchelli*	C*	X*
Black Rhinoceros *Diceros bicornis*	AC*	X*
Southern Tree Hyrax *Dendrohyrax arboreus*	AD*	XX*
Yellow-spotted Hyrax *Heterohyrax brucei*	?	?
East African Rock Hyrax *Procavia johnstoni*	?	?
Aardvark/ Ant Bear *Orycteropus afer*	?	?
Warthog *Phacochoerus africanus*	A*	XX*
Giant Forest Hog *Hylochoerus meinertzhageni*	A*	X*
Bushpig *Potamochoerus larvatus*	AD*	X*
Impala *Aepyeros melampus*	?	?
Thomson's Gazelle *Gazella thomsonii*	?	?
African Buffalo *Syncerus caffer*	ABCDE*	XX*
Common Eland *Taurotragus oryx*	BCE	X
Bongo *Tragelaphus eurycerus*	ABCDE	X
Bushbuck *Tragelaphus scriptus*	ABE	XX
Harvey's/Red Forest Duiker *Cephalophus harveyi*	ABC	X
Blue Duiker *Cephalophus monticola*	?	?
Black-fronted Duiker *Cephalophus nigrifrons*	D*	X*
Common Duiker *Sylvicapra grimmia*	D*	X*
Gunther's Dik-dik *Madoqua guentheri*	?	?
Kirk's Dik-dik *Madoqua kirkii*	AB	XX
Suni *Neotragus moschatus*	A	?
Klipspringer *Oreotragus oreotragus*	?	?
Oribi *Ourebia ourebi*	?	?
Steinbok *Rhapicerus campestris*	?	?
Waterbuck *Kobus ellipsiprymnus*	ACE*	XX*
Mountain Reedbuck *Redunca fulvorufula*	AE	XX
Bohor Reedbuck *Redunca redunca*	?	?
Huet's Bush Squirrel *Paraxerus ochraceus*	CD*	X*
Red-legged Sun Squirrel *Heliosciurus rufobrachium*	D	X*
Crested Rat *Lophiomys imhausi*	A	?
Forest Pouched Rat *Cricetomys gambianus*	A	?
Aberdare Mole-rat *Tachyoryctes audax*	?	?
Crested Porcupine *Hystrix cristata*	A	?

Table 26. (continued).

Species	Zone	Status
South African Porcupine *Hystrix africae-australis*	?	?
Common Cane Rat *Thryonomys swinderianus*	A	XX
African Common Dormouse *Graphiurus murinus*	?	?
Cape Hare *Lepus capensis*	ACE*	XXX*
Northern Scrub Hare *Lepus fagani*	?	?

Notes: Hunting dog was present, but no recent reports. Golden cat have been reported twice (Hardy, 1979; Watson, 1980), but needs confirmation.

Key:

? Probably present but needs confirmation.

* Butynski, unpublished data.

Habitat Zone:

A Present in zone A: Salient shrub.
B Present in zone B: Bamboo Forest.
C Present in zone C: Forest North.
D Present in zone D: Forest South.
E Present in zone E: Moorlands .

Status:

X Rare
XX Common
XXX Abundant
? Unknown

Table 27. Summary of transects used for buffalo and elephant dung counts in the Aberdares ecosystem, Kenya (1997-98). (See Table 28 and Maps 20 and 21.

Map	Phase	Transect	Location
20	1	1	Ruhuruini Gate Camp to Treetops Gate.
	1	2	Ark Gate to Ruhutii River Camp.
	1	3	West of K2 Campground to intersection 23.
	1	4	Ruhutii River Camp to Oni River Camp.
	1	5	Intersection 28 to Park Sub-headquarters.
	1	6	Intersection 28 to intersection 27.
	2	7	Wanderis Gate to the west; 3rd road to the north, to intersection with fence.
21	4	8	0.5 km W of Tusk Banda to Fishing Lodge.
	4	9	Kiandagoro Gate (F.R.) to Fishing Lodge.
	5	10	Kinyona Gate into forest.
	5	11	Wanyaga Gate into forest.
	5	12	Mununga Road into forest.
	5	13	Mataara Guard Post west to Sasumua Guard Post.
	6	14	Karatu Road into forest from Kieni Road.
	6	15	Munduro west to Kinale from F.R. boundary.
	5	16	Gatamayu Fishing Camp road into F.R.
	6	17	Bathi-Gatamayu Road: start - 0°57.75'S; 36°39.28'E
	6	18	Thiririka Road to Karatu.
	7	19	S. Kinangop north to Kiburu River.
	7	20	S. Kinangop to Gatare plantation.
	6	21	Ragia Forest Station from Rwanyambo River towards Kamae.

Table 27. (continued).

Map	Phase	Transect	Location
21	7	22a	Nduriri Road into Forest Reserve.
	7	22b	Down from Nduriri Road 2.7 km in from boundary.
	5	23	Gachoire Pyrethrum Road into Forest Reserve.
	7	24	Mutarakwa Forest Station through plantations towards Geta.
	7	25	Mutarakwa Forest Station towards Mahiga Meri Plantation
	7	26	Mutarakwa Forest Station through planations to Tushaga.
	7	27	Bottom of hill were natural forest begins up hill to Mutubio Gate.
	7	28	"Karuru Waterfalls 3 km" sign to Karuru Falls parking lot.
	7	29	Mutubio Gate east 4.8 km to "Karuru Waterfalls 3 km" sign.
	7	30	"Karuru Waterfalls 3 km" sign past Sapo Hut to airstrip.
	7	31	Airstrip to "Karuru Waterfalls 3 km" sign.

Table 28. Summary of results of elephant and buffalo dung counts for the Aberdares ecosystem, Kenya (1997-98). See Table 27 and Maps 20 and 21.

Phase	Transect		Distance (km)	Buffalo/km*	Elephant/km*
1	1		10.9	18.2	11.2
1	2		13.8	7.9	9.3
1	3		4.2	6.2	12.6
1	4		7.6	3.9	10.0
1	5		1.8	6.1	8.5
1	6		3.4	1.6	13.3
2	7		4.0	35.3	29.6
@	8		29.9	3.2	7.3
4	9	(F.R.)	17.2	0.0	10.8
	9	(Park)	3.4	0.0	4.4
5	10		5.1	?	5.9
5	11		6.8	?	6.3
5	12		3.4	?	16.5
5	13		20.4	?	5.2
6	14		4.0	?	2.0
6	15		14.8	?	7.3
5	16		5.6	?	1.3
6	17		5.9	?	3.6
6	18	(plantation)	4.2	?	2.6
	18	(natural forest)	1.9	?	8.5
7	19		2.4	?	5.0
7	20		10.8	?	5.6
6	21		7.7	?	1.9

Table 28. (continued).

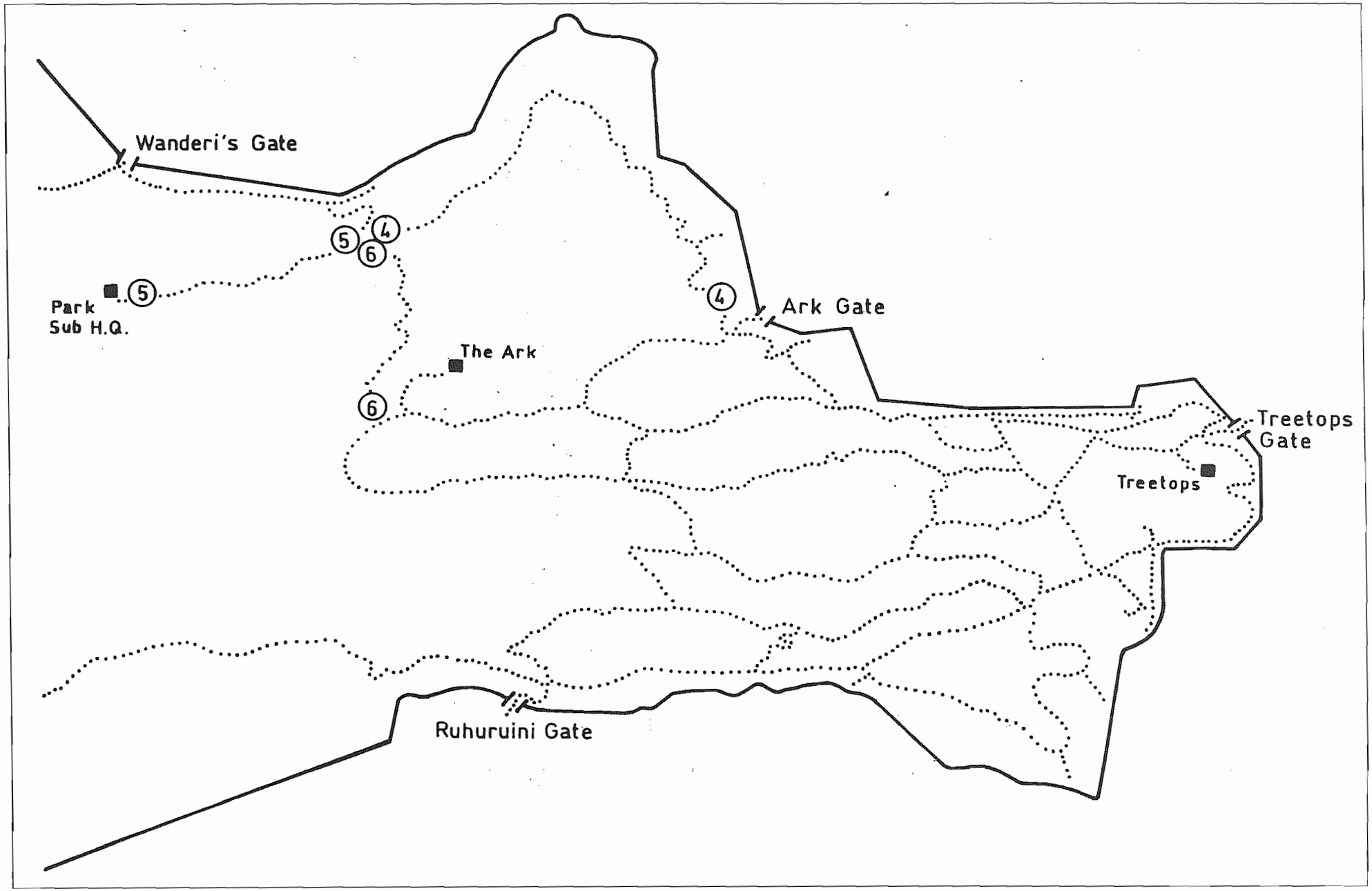
Phase	Transect	Distance (km)	Buffalo/km*	Elephant/km*
7	22	6.7	?	3.7
5	23	6.8	?	3.7
7	24	12.0	?	0.1
7	25	3.2	?	0.0
7	26	5.4	?	0.0
@	27	8.3	0.0	34.7
@	28	3.7	0.3	29.5
@	29	4.8	1.2	24.2
@	30	5.9	2.0	23.2
@	31	4.6	0.7	25.2
Total	31	250.6	Mean 5.2	Mean 9.1

* Number of dung piles/km.

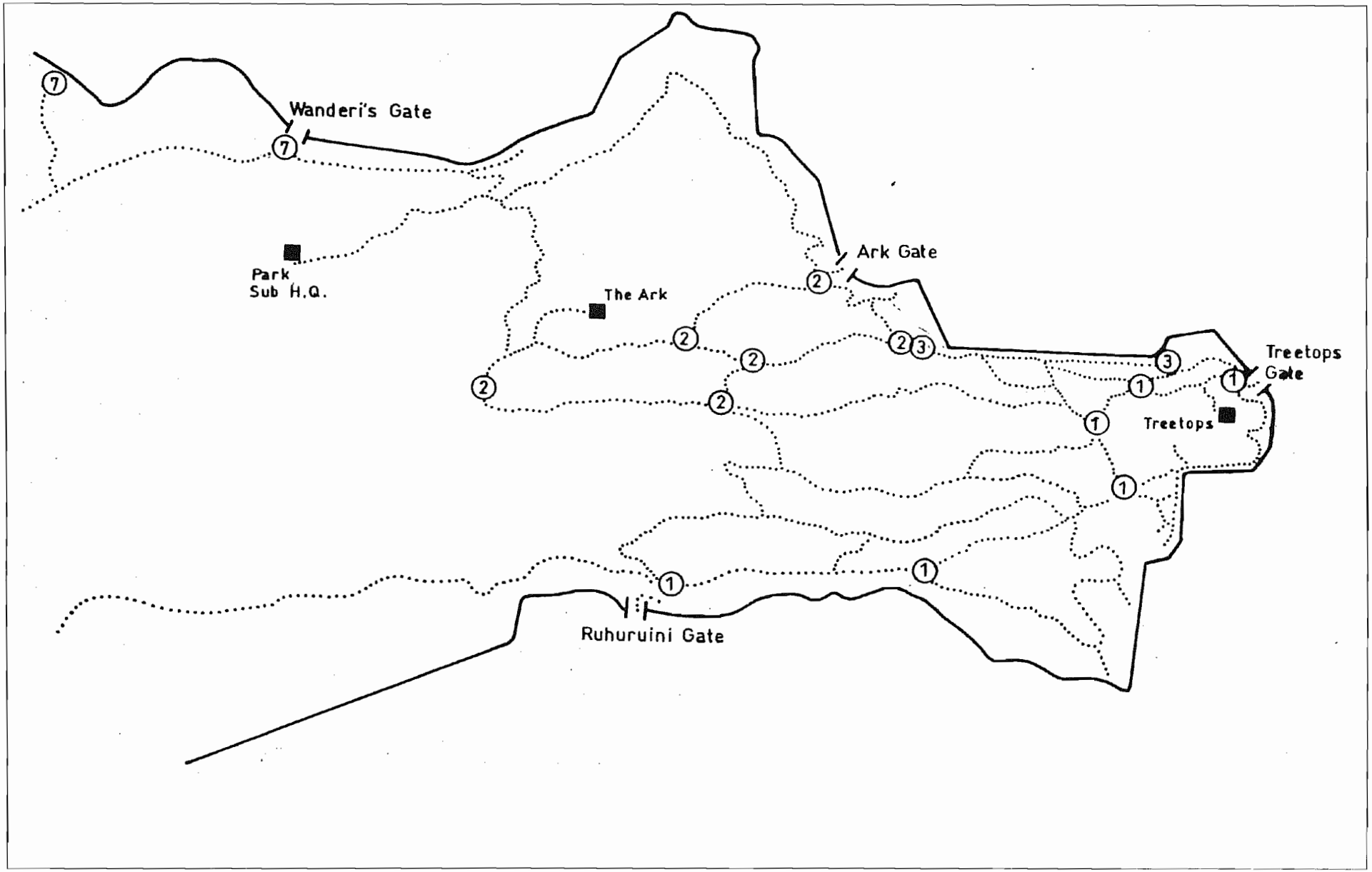
@ Southern moorlands

? No buffalo counted. Due to presence of domestic cattle in this areas, valid dung counts for buffalo were impossible. Note that the presence of buffalo in these areas is reported, but their densities are assumed to be considerably less than in other parts of the region.

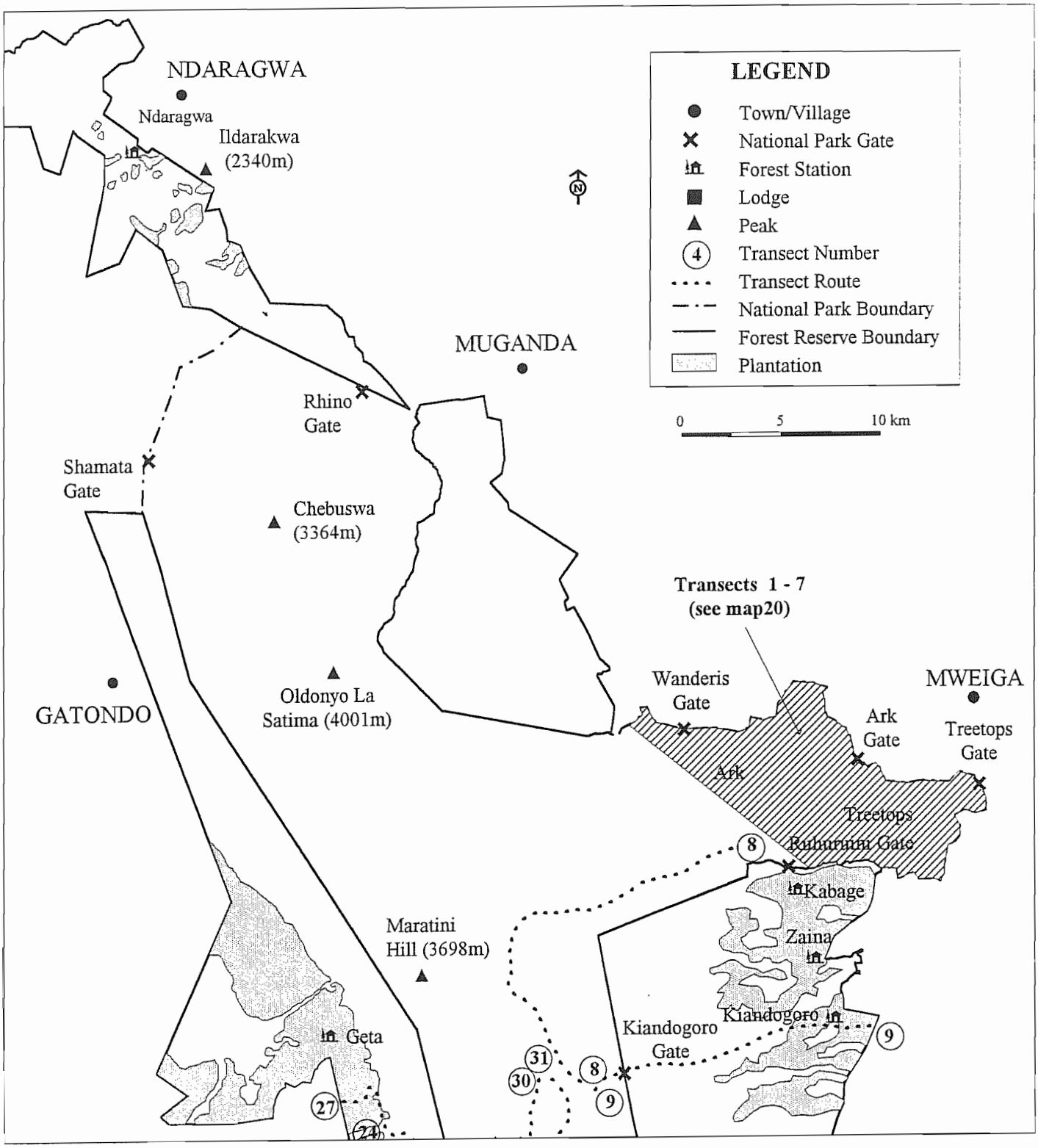
Map 20. Roads used for buffalo and elephant dung counts in the Salient of the Aberdares National Park, Kenya (1997). See Tables 27 and 28.

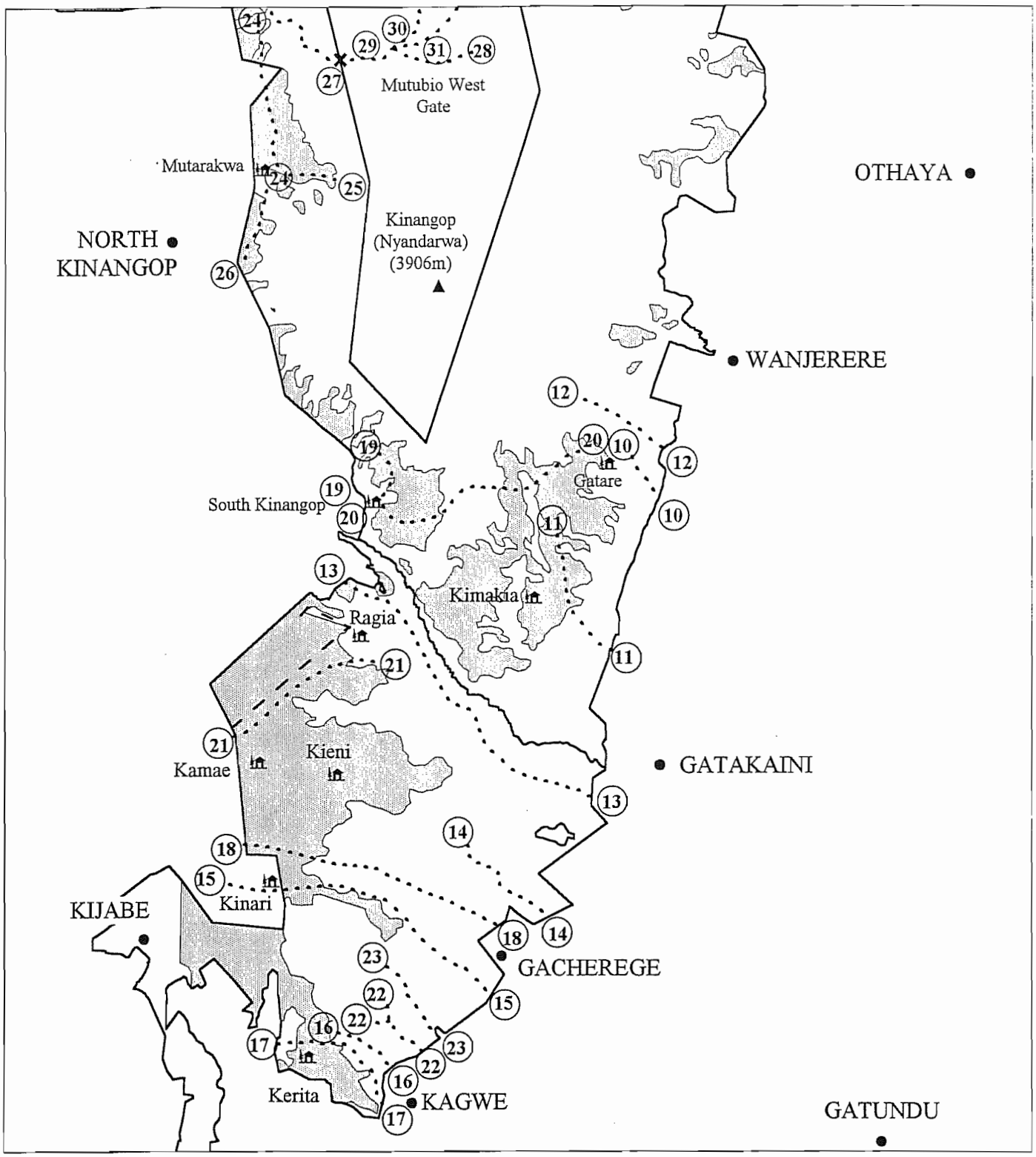


Map 20. Roads used for buffalo and elephant dung counts in the Salient of the Aberdares National Park, Kenya (1997). See Tables 27 and 28.

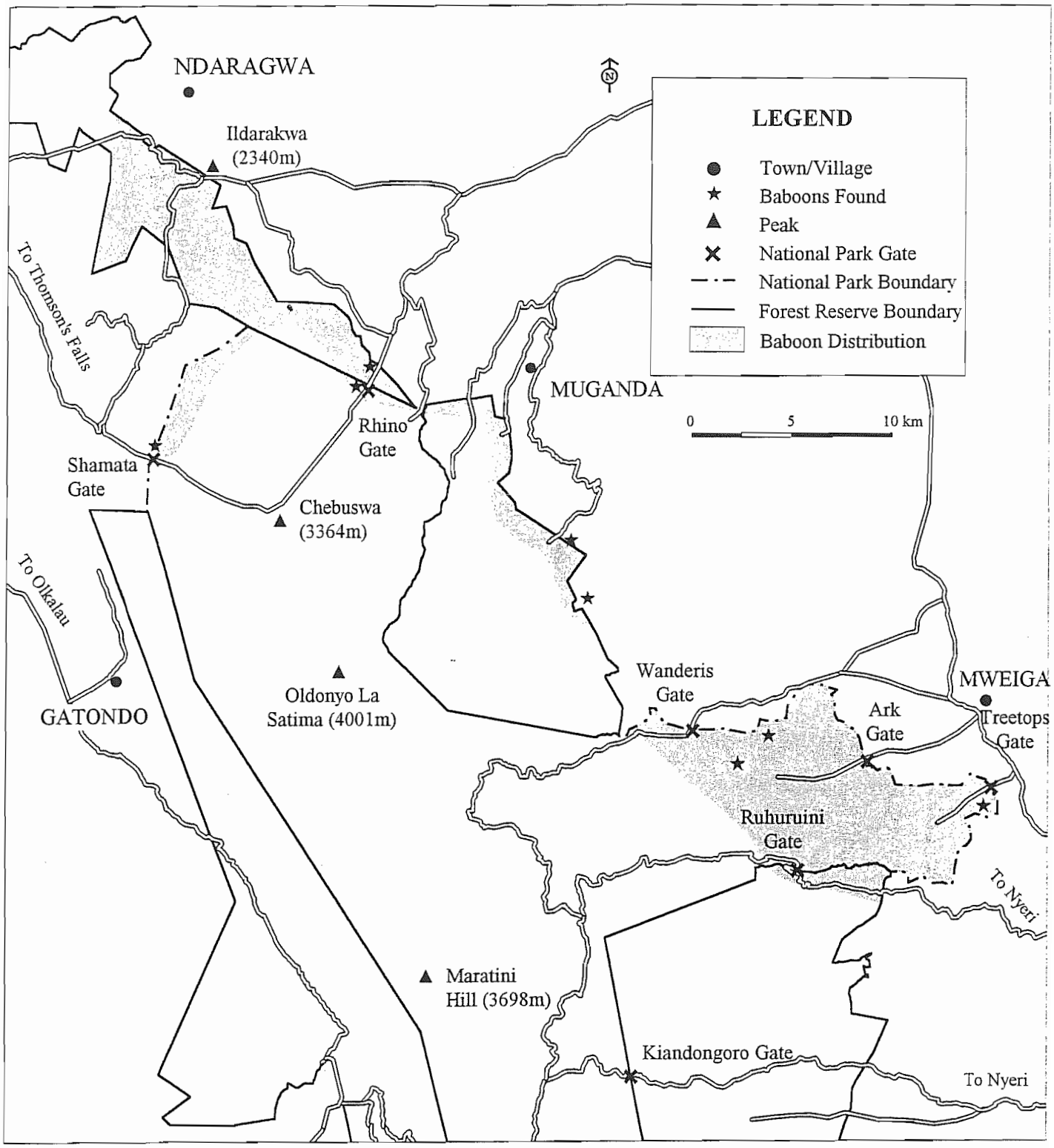


Map 21. Roads used for buffalo and elephant dung counts in the Aberdares Conservation Area, Kenya (1997). See Tables 27 and 28.

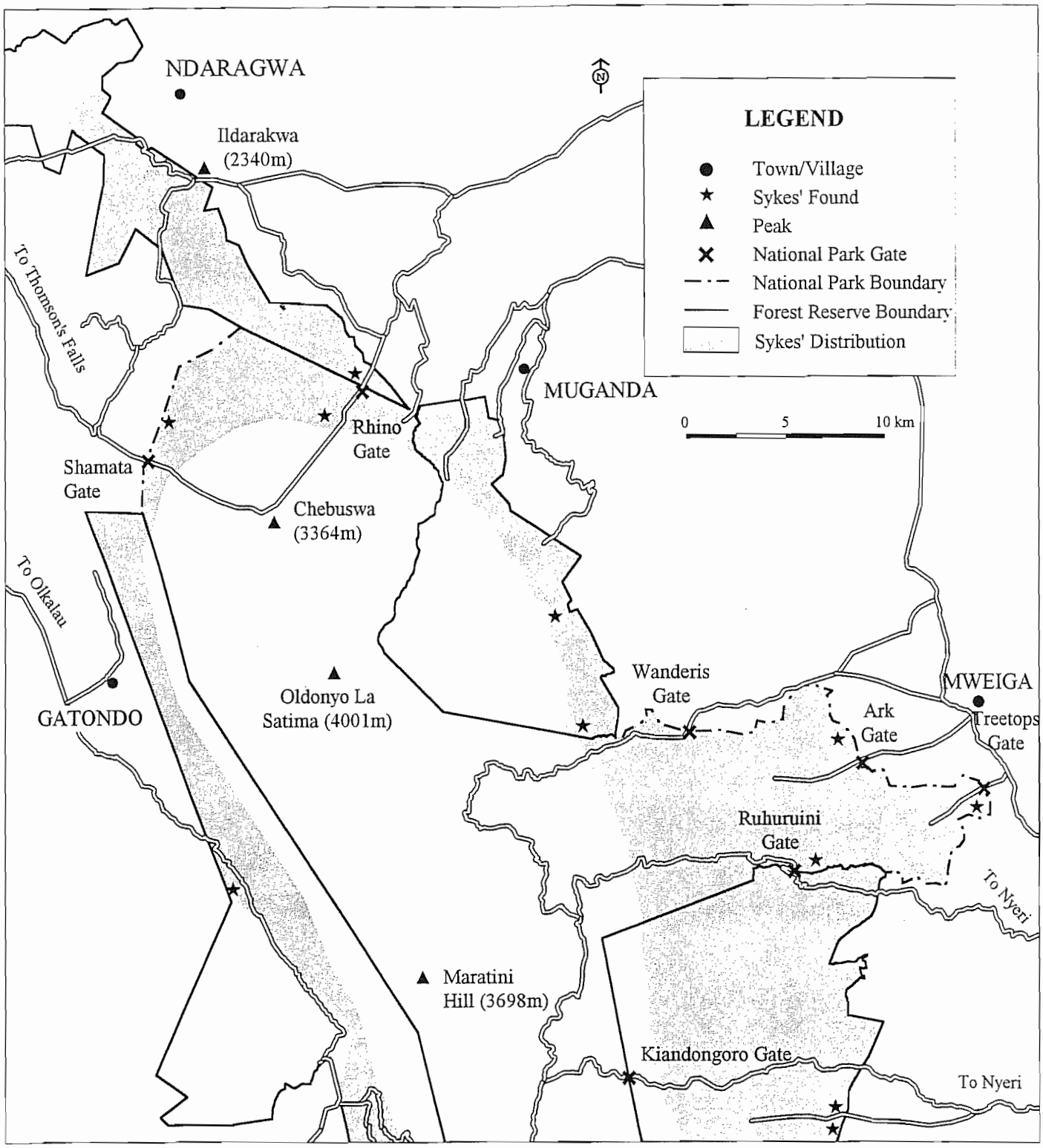


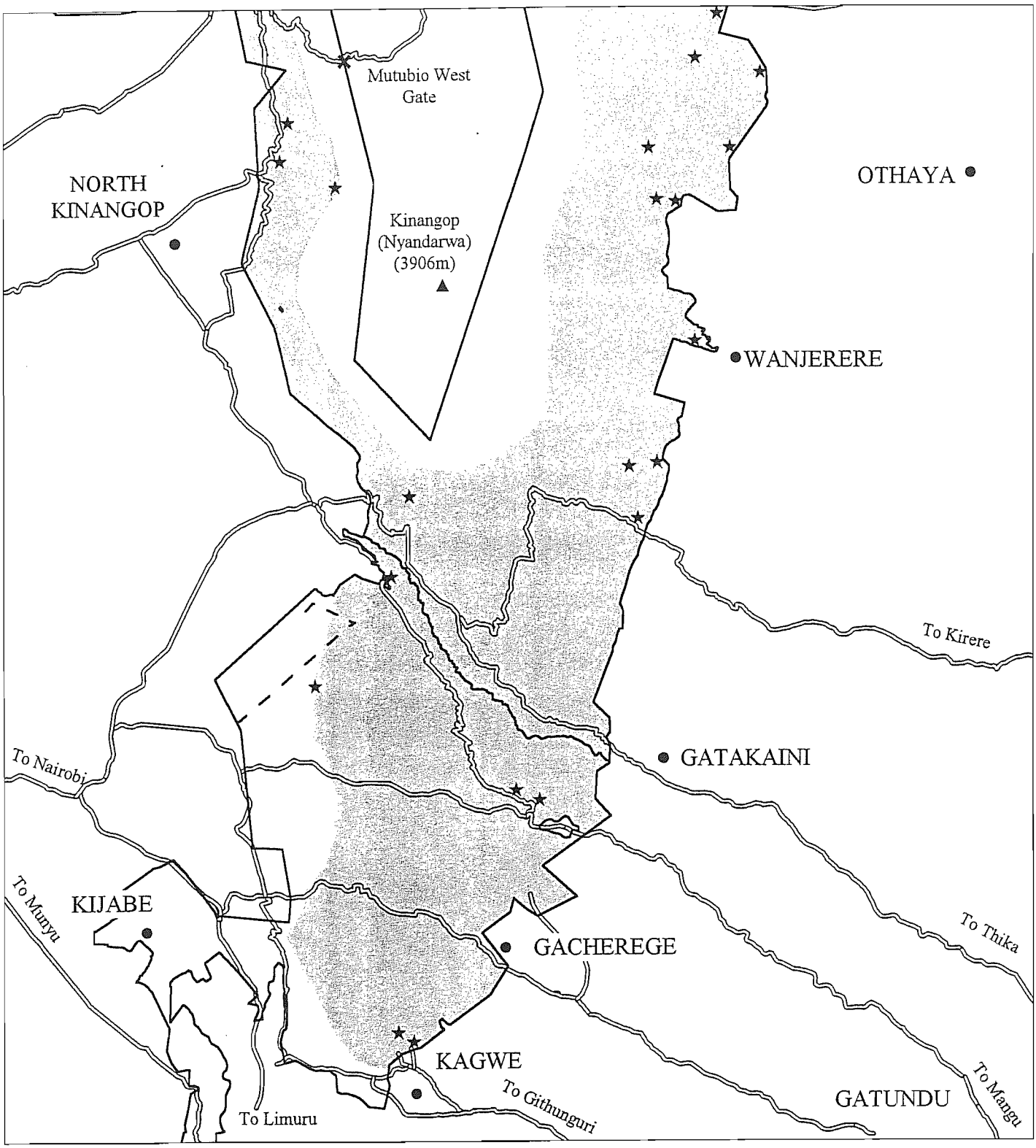

Mutubio West Gate
Mutarakwa
Kinangop (Nyandarwa) (3906m)
NORTH KINANGOP
OTHAYA
WANJERERE
Gatare
South Kinangop
Kimakia
Ragia
Kieni
Kamae
GATAKAINI
Kinari
KIJABE
GACHEREGE
Kerita
KAGWE
GATUNDU

Map 22. Locations where olive baboons Papio anubis neumani were found and the approximate distribution of this species within the Aberdares Conservation Area, Kenya (1997 - 98).



Map 23. Locations where Sykes' monkeys Cercopithecus albogularis kolbi were found and the approximate distribution of this species within the Aberdares Conservation Area, Kenya (1997 - 98).




Mutubio West
Gate
NORTH
KINANGOP
Kinangop
(Nyandarwa)
(3906m)
OTHAYA
WANJERERE
To Kirere
To Nairobi
GATAKAINI
To Munyu
KIJABE
To Thika
GACHEREGE
KAGWE
To Githunguri
GATUNDU
To Mangu
To Limuru

ABERDARES FENCE PROJECT RESEARCH: LARGE MAMMAL SIGN BELT TRANSECTS

Observers:_____
Date:_____

Phase:_____ Section:_____ Transect no.:_____ Altitude (ft):_____

Habitat type:

_____

_____

Map:

_____

Species Sign No. observed
Comments

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

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