

**Study of the Vervet Monkeys on the Shamba:
Preliminary Findings And Suggestions**

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From May 28 to June 18, 2003, a study has been conducted on the vervet monkeys that raid the shamba of the Baobab Trust in the North Quarry. Over 70 hours have been spent in the field either observing individual troops or monitoring monkey presence on the shamba. The results are a general understanding of the troops raiding the shamba, their composition, territories, and patterns of travel. This knowledge of the troops provides a basis for suggestions to prevent further loss of crops to this agricultural pest.

INTRODUCTION OF THE TROOPS

"E" Troop

This is the predominant troop on the shamba. It consists of 58 individuals: 4-5 adult males, 15-20 adult females, and 35-40 juveniles. They occupy a territory from NW of the large maize field across the west utility road to the entire eastern boundary of the shamba to just west of the south bridge (figure 1). Their eastern territory beyond the shamba perimeter extends east to the wall for the Mombasa road and south to the central access road. Though they occupy some territory away from the shamba, the majority of their day is spent along its edge. A typical pattern of movement has the troop traveling from across the utility road on the west to the bush area on the northern boundary first thing in the morning. Often they keep a distance from the north shamba edge but remain within the bush and use it as a corridor to the eastern boundary. They then come to the shamba edge, often at the NE corner, and travel south during the day (figure 2). Occasionally, they spend either the morning or the afternoon in the forest east of the shamba (figure 3). Throughout the day, they feed on the citrus trees and raid the vegetation in the fenced shamba. They spend a considerable amount of time at the container area every day and they often use this area to rest and to play in addition to feeding. They generally return north along the same eastern perimeter in the afternoon. During early evening observations they have been seen crossing the large maize field directly from the east side of the shamba (figure 4). This approach gives them full access to the maize field, as the stone thrower cannot see them from her typical position. Not all members of the troop

feed, but they use this area as a waypoint to their sleeping trees beyond the fence that borders the west side of the utility road. As they are unable to be followed after they cross this fence, their exact sleeping trees are unknown.

This group is very habituated as they are adjusted to being in proximity of humans on a daily basis at locations such as the container. They actively flee those that successfully strike them with stones but they will closely approach those who they do not perceive as a threat.

They are the dominant troop on the shamba and actively displace all other troops present. The size of the troop would make it difficult for any other neighboring troop to challenge them.

"S" Troop

This troop consists of just 7 individuals: 1 dominant male, 2 adult females, and 4 juveniles. They have a very small territory south of the shamba (figure 5). They occupy most of the riverine forest patch but occasionally move a bit north along the western boundary. However they generally only retreat to this location if the "E" troop is approaching their territory. They sometimes cross the road to the south to feed but they are generally present at the shamba perimeter the entire day. The farthest east they will travel is the small patch of dense vegetation just east of the bridge. They enjoy the lianas growing in the tree around the river and often seek shelter in these to forage and to rest. They are still fearful of humans and actively disperse when a human is present. In the time spent with them, they have grown more accustomed to human presence. Though close to shamba for the entire day, they do not frequently access the edge towards the crops. The only crop they threaten is the maize in the SW region of the shamba, but they have never been observed successfully raiding crops at any time. No crop remnants can be found in the river area where they retreat to, but they do challenge the boundary frequently and occupy a considerable amount of the stone thrower's time.

"S" troop is subordinate to the "E" troop as they avoid them when they approach, but in an intergroup with the "SE" troop, they managed to deter them with vocal threats despite being 1/5 the group size. Perhaps the southern territory is not desirable enough for larger groups to battle for the right to occupy it.

“SE” Troop

SE is only an occasional visitor to the shamba. They are a troop of about 35-40 individuals. Group composition could not be determined as they are rarely present, are cautious of humans and occupy dense bush. Their territory lies south to SE of the shamba (figure 6). They are most frequently in the dense bush that extends towards the soccer field in the south. Access points to the shamba are the SE corner and west and east of bridge. Departure points are just south of the container area in an easterly direction and west of the bridge. Their presence on the shamba always creates intergroup frictions. They have conflicted with both “E” and “S” groups and “SE” has always come out the subordinate. This is a group that could easily occupy a vacant territory on the shamba as they push the boundaries of their current territory when other shamba groups are absent. The only observed successful raid occurred from the SE edge up to the container. (Figure 7 shows their movement in and out of the shamba.) They accessed the crops contained in the fenced shamba. They eventually were displaced by the “E” troop and left the shamba through the forest to the SE.

“W” Troop

Little can be learned about this troop as they occupy a territory beyond the fence of the west utility road (figure 8). There could in fact be several troops but due to the shared territory with the “E” troop, it is unlikely that there is more than one. They mainly feed on the neighboring shambas to the west. They occasionally threaten the large northerly maize field by traversing the fence. Only a few at a time have been observed crossing the fence towards the maize, and they were always successfully chased away. They do seem to actively search for the stone thrower by climbing to the top of the cauarinas bordering the west side of the utility road. Then they either retreat or attempt to raid.

“N” Troop

Another troop has been observed outside the shamba. They have never been seen on the perimeter of the shamba, but they share territory with the “E” troop. They inhabit an area north east of the shamba perimeter. They are a troop of about 30. Their importance lies in

the fact that they could easily take over territory along the shamba edge if left vacant by the "E" group.

General Behavior

The typical behavior of the monkeys while raiding the shamba is to quickly run into the field, grab a fruit or vegetable, and return to the cover of trees. Evidence of this are the remnants of crops like citrus peels scattered throughout the nearby patches of forest.

The monkeys often actively search for the presence of humans. They do avoid people that they have learned to fear. On occasion, they fear scream and alarm call when a stone thrower is present. They clearly raid more frequently when no stone thrower is visible.

SUGGESTIONS TO CONTROL MONKEYS

The current method of controlling the monkeys is by employing two fulltime workers to throw stones at the monkeys whenever they threaten the crops. Though it does not prevent the monkeys from occupying the perimeter of the shamba, it is an effective method to prevent the monkeys from spending extended periods of time in the crops feeding. If these workers were not present, the monkeys would be causing more damage. The suggestions listed below are to be considered in conjunction with the use of stone throwers.

Maintain pathway around shamba and remove some problem vegetation

Seeing as vervet monkeys are edge dwellers and do not often leave the security of forested or brushy areas, many sections of the shamba perimeter provide ideal habitat for the monkeys. Ideally, the shamba should be made as inhospitable as possible to the monkeys and challenge their natural movements.

-A clear pathway should be maintained around the entire perimeter of the shamba. Large pathways also offer a better means to control them by stone throwing. Once the monkeys are under the cover of vegetation their movement away from a stone thrower halts. A pathway offers an edge that you can force the monkeys towards. They are also very

cautious or uneasy when they pass through an open pathway, as they are easily visible and most susceptible to predation.

The vegetation that adjoins the crops offers concealed raiding for the monkeys. If they can no longer access the crops directly from the perimeter of the shamba, fewer crops will be eaten. In particular, the area around the container allows the monkeys to easily travel through every section since no area is strictly defined. Any attempts to throw stones here is futile and the effort to do so is abandoned quickly. New pathways could also be effective in the SE quadrant of the shamba. By creating path that is perpendicular to the shamba edge, a stone thrower could force a troop either north or south and away from the crops.

-The bands of vegetation between the roadways and the crops should be thinned or removed. These are the patches that the monkeys find shelter and security in on their way to and from the crops. Specifically, the dense vegetation between the north citrus trees and the main road allows the "E" troop to travel virtually unnoticed all along the eastern perimeter of the shamba. If this vegetation is removed or thinned out, the monkeys will have less area to seek shelter in and the stone throwers will have better visibility of the troop. This could reduce the loss of citrus fruits.

-There are trees within the shamba that should be removed if they have no economic purpose. The Neem trees that are located near the large maize field provide cover for the monkeys when they approach the field from the east side in particular. These trees encourage the monkeys to stay for extended periods of time often without being noticed. Another Neem tree that sits on the fence line of the enclosed section of shamba provides the only direct access to these crops. Otherwise the monkeys must climb over the fence to enter it. This tree makes access easier and it should be removed. Neem trees are also an attractive food source to the monkeys when it is fruiting.

The casuarinas that border the utility road on the west also provide lookout points for the monkeys to observe for human presence on the maize field. Removing these would eliminate this advantage the monkeys have detected.

Educate the workers on the shamba.

-The stone throwers should be educated on the troops present on the shamba- how many, where they go, where they enter the shamba- so that they can better predict where and when the monkeys will be on the shamba. In particular, they need to understand the "E" troops movements as they are the main crop raiders and consistently are present on the shamba without any workers present. They are often left free to raid. If "E" troop's movements are better understood they might be able to be deterred from reaching the container area where it is difficult to control them and force them to their territory east of the shamba. Also, perhaps less time would be allotted to the "S" troop by the stone thrower if she is aware that there are only 7 individuals in that group.

-No troop should be allowed to raid freely. If a crop is not being harvested, the monkeys should be forced out to prevent reliance on the shamba for food.

Expand stoning practices.

-All workers on the shamba should carry slingshots. The monkeys do avoid those that pose a threat. If as many humans as possible are feared, they may spend less time in places like the container area.

-Piles of stones should periodically placed at points where the monkeys typically enter the shamba so that there can be as many stones thrown as possible. The riverbed, when dry, is an ideal source for the stones. Ideal locations for these stockpiles are the NE corner, the central access road north of the container, the container area, and the SE corner.

Condition the monkeys to fear whistles.

-As an experiment, a number of people should carry whistles on the shamba. When a troop is seen raiding, someone blows their whistle to summon all those with slingshots (provided many workers are carrying them). Then, everyone throws stones. Soon, the monkeys may be conditioned to associate whistle blowing with a strong attack by man. When a whistle is blown in the future the vervets may disperse before a group of workers must come to stone. If they eventually learn that the whistle no longer summons human with stones, the procedure may have to be repeated.

Consider the monkeys when determining the layout of the shamba.

-When the monkeys are successful at raiding the shamba, it is most typically towards the edge. When determining the location to plant crops, those most palatable to monkeys should be kept away from the perimeter to prevent easy access.

-The compost pile is attractive food source for the monkeys as well. They have already been observed feeding there. Ideally, the compost pile should be away from vulnerable parts of the shamba, preferably at a corner. If the compost cannot be moved, perhaps food scraps can be put at another location to prevent the monkeys from relying on the container area for readily attainable food.

Test alternate methods.

Other methods of controlling the monkeys will be tested in the coming weeks.

-Research has suggested that monkeys have aversions to tastes such as vinegar and chili powder. If this is found to be true for vervets, it may be possible to spread these substances on crops such as citrus as a deterrent particularly when the fruit comes into season.

-Short-term success has been found with recording territorial and alarm calls. When played back to a troop, they either disperse or go to defend their territory against an approaching troop.

Trapping the monkeys and transporting them to another territory.

This method should be considered as a last resort as it can be time-consuming, expensive, and potentially dangerous to the animal. It may be most effective to use this approach just before a threatened crop comes into season to optimize the amount of time with that fewer monkeys are present. This method may be very effective to remove the small "S" troop of seven individuals that consistently occupies the southern boundary of shamba. The territory will open to the "SE" troop, but they will not be able to spend all their time there as it is a large group. In theory, removing the "S" troop could allow a stone thrower to devote more time to controlling the "E" troop. Though the "E" troop is the main crop raider, the size of the troop may prove trapping to be ineffective. In order to capture a large number of individuals, a large number of traps will be needed. If the trapping is

done in episodes, the monkeys will learn too quickly to avoid the traps. This will result in few monkeys captured (McKensie, 1993). Trapping could be useful on the "W" troop since it may only be a few individuals that will cross the utility road into the large maize field. The "SE" troop is too infrequently on the shamba to use this method. They could become a bigger problem on the shamba, however, if a territory opens due to trapping. Some consideration has been paid to the best method to trap the monkeys. A design for a simple trap can be found in figure 9. As many traps as possible should be used. Ideally, there should be one trap for each monkey to be captured but not less than one-third of the number of animals to be caught. Traps should be used in an area habitually visited by the troop but away from an abundant food source. Traps should only be used once the monkeys have become adjusted to finding bait at the trapping site. Then they must acclimate to entering traps for food before the traps are actually set. Once a trapping exercise has been completed, trapping at the same site may be difficult. Always go through the pre-baiting procedure again. However, it may be necessary to switch sites as they will quickly learn to avoid the traps and the area (McKensie, 1993).

There are a few important points to consider when trapping vervet monkeys. This species in particular becomes stressed when captured. They may attack each other even when they are members of the same troop or injure themselves. For this reason, each adult animal must be captured and transported by themselves. Trapping large numbers of primates together is not recommended (McKensie, 1993).

CONTINUATION OF PROJECT

The next stage of this project is to begin the process of pre-baiting at capture sites so that the trapping exercises can begin as soon as the traps are built. Also, the materials available to build the traps will have to be assessed to determine the costs of constructing them. The other methods of deterring the monkeys will also be explored and tested.

BIBLIOGRAPHY

McKensie, Andrew A., Ed. 1993. **The Care and Capture Manual**. Wildlife Decision Support Services and The South African Veterinary Foundation, Pretoria.

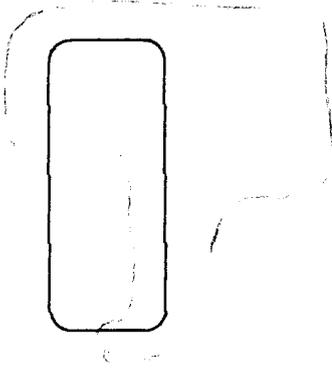


Figure 1
"E" Troop
Territory

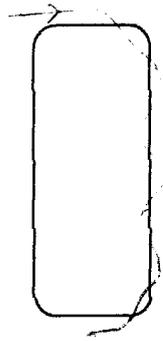


Figure 2
"E" Troop
Movements South

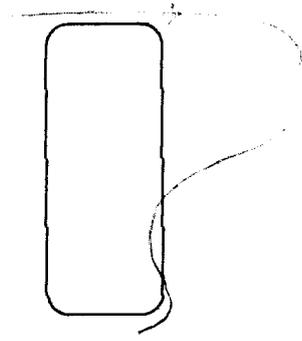


Figure 3
"E" Troop
Movements South



Figure 4
"E" Troop
Movements North

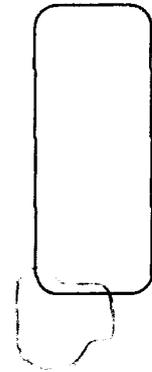


Figure 5
"S" Troop
Territory

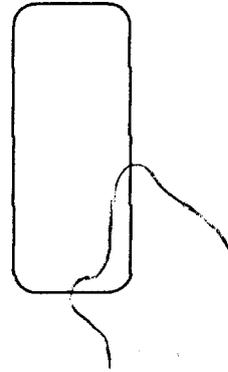


Figure 6
"SE" Troop
Territory

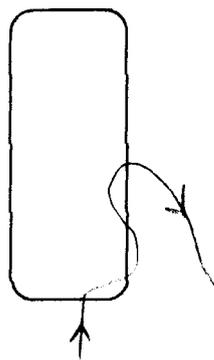


Figure 7
"SE" Troop
Movement

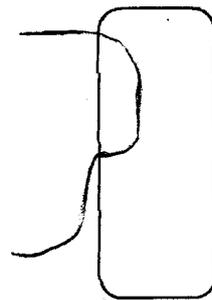
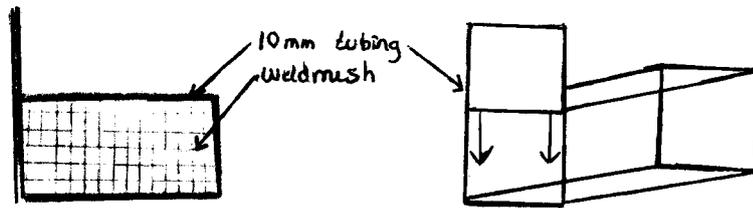


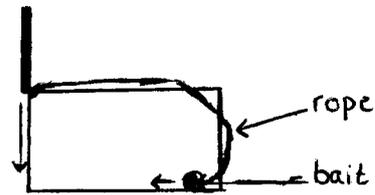
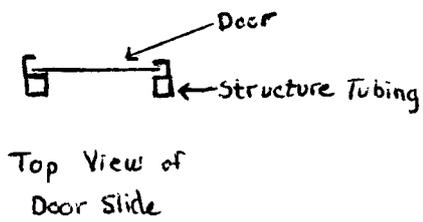
Figure 8
"W" Troop
Territory

Design for Primate Trap



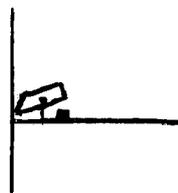
Basic Structure

500 mm x 500 mm x 1000 mm

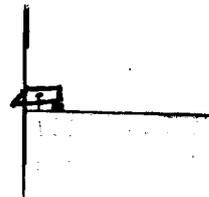


Trigger Mechanism

-when bait pulled, rope releases, door falls



Door Open



Door Closed

Safety Catch

Figure 9