Research Note

Basket-making from *Secamone* climbers in the Northern Province forests: Can it be sustained?

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SYNOPSIS

The paper describes the measures taken to try to understand the impact the harvesting of lianes, *Secamone gerrardii* and *Secamone alpinii*, has on montane-forests in the Tzaneen area. Based on these findings an interim decision needs to be taken on whether harvesting at present rates should continue or not. Nine monitoring plots have been laid out in two forests in the area. The purpose of these plots was: firstly, to determine how many baskets could be made per hectare of forest; secondly, to describe immediate damage to the forest from harvesting; thirdly, to measure diameter growth rates and to monitor coppice regeneration.

INTRODUCTION

The Department of Water Affairs and Forestry recognises the importance of sustainable utilisation of indigenous forest resources. However, since the conservation of our forests remains our first priority, it is important that we try to find a balance between utilisation and conservation. In the Southern Cape forests the protected fern *Rumohra adiantiformis* is harvested at a sustainable level from the forest, based on scientific studies of its biology and ecology (Geldenhuys and Van der Merwe, 1988). Excess demand from local and European markets is provided from nurseries – under indigenous forest, under pine stands and under shadecloth. Along the wild coast of the Eastern Cape, the bamboo *Flagellaria guineensis* is harvested for the basket industry, and the Umzimbithi tree *Millettia grandis* is used in the wood-carving industry (Cawe 1999, Cawe and Ntloko, 1997). If the demand for products from these species increases then it will be necessary to implement some form of Joint Forest Management to reduce conflict between local entrepreneurs and resource management authorities.

Recently the Department of Water Affairs and Forestry (DWAF) became aware that the lianes *Secamone gerrardii* and *Secamone alpinii* are being harvested from Swartbos forest, Magoebaskloof area, Northern Province, for use as weaving materials in an informal basket-making industry. These lianes occur abundantly in the middle and upper montane-forest zone of the Magoebaskloof area. *S. gerrardii* is common to montane-forest and marginal-mistbelt forest. *S. alpinii* is locally common in high forest, but less so in forest margins and scrub forest (Scheepers, 1977).

Currently the demand on the resource is limited to a group of seven people who collect lianes and weave baskets themselves. The lianes are collected on a daily basis from two indigenous forests, Black Forest and Baccarat Forest, both falling under the management of the Conservation Forestry Section of the Department of Water Affairs and Forestry. The Department has known about the harvesting of these vines since February 1999, when this group was found harvesting lianes in Swartbos. Prior to this, they were working in the drier areas of the former Lebowa. The group had recently moved into the new area as a result of other groups of weavers starting to use their former resource. It is not clear whether this industry will grow or not, but the potential use of the lianes from indigenous montane-forest is limited. This is because the indigenous forests in the area are not extensive.

This paper describes the measures taken to try to determine the impact harvesting lianes has on montane-forest and to take an interim decision on whether or not harvesting at present rates should continue.

Description of the Forest

Scheepers (1977) described Montane-Forest, as occurring at an altitude of between 1200 m and 1800 m above sea-level, on steep terrain with an easterly to south-easterly aspect. Precipitation is mainly orographic, blown in from the north-east and south-east. It is a summer rainfall area with warm wet summers and cool dry winters. Mean annual rainfall is 1884 mm. The canopy of upper montane-forest is irregularly open to closed and varies in height from 10 m – 20 m. The canopy is dominated by *Cryptocarya liebertiana, Syzygium gerrardii, Cussonia spicata, Nuxia floribunda, Xymalos monospora, Trichilia dregeana, Olea capensis* subsp. *macrocarpa, Croton sylvaticus* and *Ficus craterostoma*. The understory is open and is chiefly composed of *Xymalos monospora, Rinorea angustifolia, Ochna arborea var. o connorii*

and *Drypetes gerrardii*. *Mackaya bella*, *Piper capensis* and *Plectranthus spp.* are commonly found in the shrub layer. The most common lianes and scramblers are *Keetia gueinzii*, *Protasparagus falcatus* and *Secamone gerrardii*.

METHODS

Monitoring plots

Nine monitoring plots have been laid out, three in Black Forest and six in Baccarat Forest. The purpose of these plots was firstly to determine how many baskets could be made per hectare of forest, secondly to describe immediate damage to the forest from harvesting and thirdly to measure diameter growth rates and monitor coppice regeneration.

The experimental design comprised three treatments in three replications. Three 10 m x 10 m plots were laid out adjacent to one another in each replication, a total of nine plots.

The replications vary in terms of the height of the canopy and the proximity to the forest edge. See Table 1.

Treatments

In each replication, one plot was used as a control, a second plot for harvesting vines for small baskets and a third for harvesting vines for big baskets. Smaller baskets use much thinner material than larger ones. Thus the pressure on the forest from using the different sized material would depend on the number baskets made in each size.

The number of baskets that were made in the second and third plots per replication were counted. It was decided to record the number of baskets made, rather than the biomass of lianes collected. This was done so that one could talk in terms of the number of baskets made from material collected per day or per hectare, which is easier to quantify than biomass.

In addition to the control plots, an exclusion zone has been demarcated in both Black Forest and Baccarat Forest. This has been done so that, if needed in the future, more extensive comparisons can be made between parts of the forest that have been harvested and parts where the forest has not been disturbed by harvesting. This may also be useful for further studies on the changes in light penetration. The exclusion zone extends down the slope, from one end of the forest to the other and is 100 m wide. The basket makers have been shown the zone and asked not to harvest anything from the demarcated area.

Harvesting

We asked the six basket makers to do the harvesting for the monitoring plots. Each person had a pair of secateurs and worked individually when collecting the lianes. When a liane was identified it was first cut ± 25 cm from the base. The liane was then pulled down from the canopy. If the liane did not come down completely it would be tugged and cut at arms-length above the person harvesting the vine. On some occasions the tree would be climbed to dislodge the vine while a second person tugged from below. The lianes would be dragged to the edge of the forest or to an open space until there was enough material collected to make a few baskets.

Measurements

In the second and third plot in each replication six harvested plants per plot were tagged for later coppicing records. In the control plots, where no plants were harvested, six plants with a variety of diameters were tagged for circumference measurements. Monthly measurements will be taken to determine diameter growth. Depending on initial results, the frequency of these measurements may be reduced.

The damage caused to the forest during harvesting was roughly described for each harvested plot.

RESULTS AND DISCUSSION

Material Collected and Number of Baskets per Plot

The size of the lianes collected varied depending on the size of the basket being made. Bigger baskets used much thicker material (1 cm – 2 cm diameter)

TABLE 1: General description of the three sites used as replication in this study

	Black Forest Rep. 1	**Baccarat 1** Rep. 2	**Baccarat 2** Rep. 3
Position	Inside forest	Inside forest	Edge
Canopy	8 – 10 m	15 - 20 m	10 – 12m
Ground cover	80%	5%	50%
Aspect	South east	South east	South
Altitude	1720 m	1586 m	1570 m

than smaller baskets, which used vines of 0.5 cm – 1 cm diameter. The lengths of the cut lianes varied between 1 m – 5 m in length. The higher canopy forest had longer lianes available than the lower canopy forest. Thinner lianes below 0.5 cm in diameter were used as twine to finish off the baskets. Diameters smaller than 0.3 cm were not used at all.

Vines were more frequent in replication 1 (Black Forest). Numerous separate plants were found within a plot. The vines in replication 2 (Baccarat 1) were limited to one or two rooted plants per plot. These had many side shoots and longer stems climbing into the canopy. Thus in this type of forest cutting the vines may seriously deplete the population. In Black Forest where individual plants are more abundant, harvesting may have less effect on the population. Vines in replication 3 (Baccarat 2) had a similar distribution to those found in replication 1 (Black Forest).

It appears that the plots in the lower canopy forest (Black Forest) produce 5 times more baskets than the plots with an edge effect, which in turn produce twice as much as the high canopy forest (See Table 2).

Regeneration and coppice growth

The rates of coppicing and diameter growth will be measured monthly. Data taken over a four month period have already been collected from the plots. Results show that diameter growth for eight months (March 1999 – October 1999) has been negligible. Coppice growth was first recorded in Baccarat 2 in May, two months after the stems were cut for collection. In June coppicing was recorded in the remaining two replications, Black Forest and Baccarat 1 (See Chart 1). The stems were coppicing profusely, within three months. Coppice shoots were clustered at a number of places on each cut stem. The diameter growth of the coppice shoots will be measured once the stems have developed bark. It is unclear why Baccarat 2 coppiced ahead of the other two plots. It might have something to do with temperature and moisture differences. Coppicing and diameter growth measurements will be continued until reliable information on regeneration can be obtained. A study done on *Ocotea bullata* by Lubbe (1990) found that self-thinning takes place within the first year of coppice growth and that the final number of shoots depends on the vigour of the stump. It would be interesting to observe any decrease in coppice shoots as many of the mature vines did not have prolific multi-stemming.

Description of Immediate Disturbance

There was surprisingly little damage to the canopy of the forest. Harvesting smaller diameter lianes caused less damage to the canopy than taking thicker lianes. Tree climbing to retrieve lianes also caused less damage than tugging at them from the ground. When tugging, dead branches were dislodged, also some live twigs and leaves, but no live branches were broken. Ferns and mosses growing on the dead branches were brought down with the branches. No other epiphytes were dislodged during harvesting. Fruit and flowers could be affected by shaking the tree and dislodging twigs. Damage to the canopy is limited to the trees where lianes are being harvested.

The only visible damage to the forest floor was trampling of the undergrowth and soil disturbance. Roots of the lianes are left in the soil and most lianes are cut 20 – 30 cm above the ground; thus layering and coppicing will probably take place as the main form of regeneration. Possible longer term impact on the understory and herbaceous layer may later be caused by an increase in light penetration by the removal of the lianes from the canopy.

According to Scheepers (1977), the liane component in the upper montane-forest contributes to the density of the forest canopy, 'knitting' an open canopy together. Thus the removal of the creeper may have a long-term impact on forest regeneration. Although this was not measured in these monitoring plots, it could be interesting to measure the change in light infiltration over time and the effects on the lower strata of the forest.

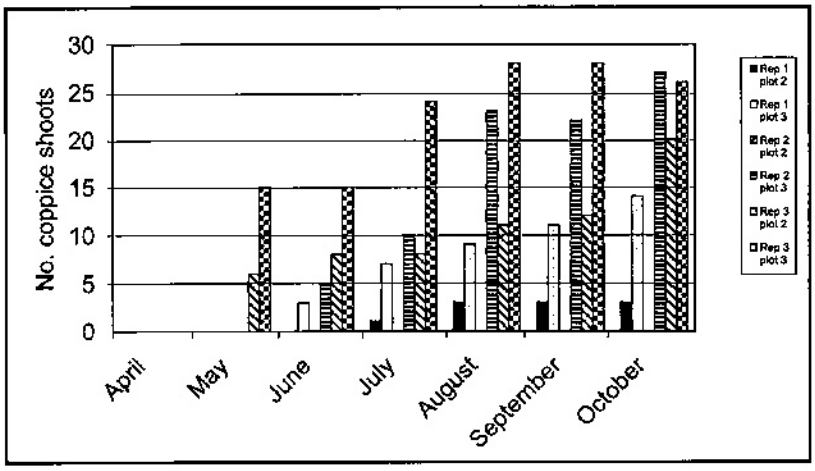

CHART 1. Trends in coppice regeneration.

TABLE 2: No of Baskets made per Replication

	Black Forest Rep. 1	**Baccarat 1** Rep. 2	**Baccarat 2** Rep. 3
Small baskets	17	0	2
Large baskets	4	1 1/4	2

Commercial Aspects

The information on commercial aspects of the informal business was gathered through an interview with Owen Sithole, one of the weavers.

There are three groups of people in the Northern Province making baskets from natural resources. Two of the groups are based in drier areas of the former Lebowa and Mafefe areas. These groups use a range of materials such as grass, pieces of decorative wood, twigs and creepers. Owen's group relies solely on *Secamone spp.* found in these montane-forests.

Owen supplies to order. He supplies florists in Tzaneen and Pietersburg with 200 – 300 baskets a month. Most orders are for the smaller baskets, but 5 – 6 jumbo or large baskets are also ordered each month. He also makes flat baskets, balls, rods and even Christmas trees and bells. His receipt book shows a gross revenue of R 2000 – R 3000 per month.

Owen has six people working for him. He pays a wage of between R 15 – R 25 per day depending on production. His major overhead costs are transport, accommodation for the six people and his cellphone account. He does not have a vehicle and so has to pay for transporting his baskets. His cellphone is used to arrange orders.

For Owen to break even he needs to make some R 2800 per month. This means that he needs to sell at least 245 small baskets at a selling price of R 10 and 10 big baskets at a selling price R 35 per month.

CONCULUSION

The results from Black Forest indicate that 1700 small and 400 big baskets could be made per hectare. On the other hand Baccarat 1 made 125 big baskets per hectare and no small baskets. Baccarat 2 shows 200 small baskets and 200 big baskets that could be made per hectare. Thus if Owen needs to produce a minimum of 245 small baskets and 10 large baskets he would be using 1 – 2 ha of forest per month to satisfy his demand.

The basket makers move around the forest and use a wide area: they are not confined to one or two hectares of forest a month. Over the last four months they have produced on average 266 small baskets and 6.25 large baskets per month. This means they are using on average 1 – 2 hectare's worth of material a month. The forests being in total 427 ha in size, there is thus 213 month's worth of material (assuming no regeneration takes place).

As a conservative limit, we have decided that Owen should not make more than 300 small baskets and 10 big baskets per month and that he should try to sell his baskets for more than he is getting at the moment. If he starts to produce more than his quota he may think of using only four people rather than six, so reducing his costs and increasing his profit margin.

Judging from what was gathered at the interview, the demand for baskets surpasses the rate of manufacture, so the dependence of the basket makers on this material is high. This puts a heavy responsibility on DWAF, not only to allow collection of vines, but also to ensure that the resource does not get over-utilised.

RECOMMENDATIONS

What should be done in terms of resource use to make this venture more sustainable? If DWAF were to allow more extensive harvesting of this resource, this study will have to be expanded. Demand may increase if Owen wants to expand his business or if other people become interested in the resource.

In this study it is assumed that every 1 – 2 ha of forest will contain enough material to sustain production within the limits set. We need to get a better understanding of the actual abundance and distribution of the vines in the indigenous forests. This would entail a thorough resource inventory with many more sample plots distributed throughout the forest. Not enough is known about disturbance caused to the forest by harvesting, particularly long term impacts on the resource itself and changes in forest structure. A wider range of information needs to be collected, including data on forest regeneration and light infiltration. The samples used in this study are too small to get a good feel of what is actually happening.

Control and monitoring techniques will have to be developed around the sustainable management of the resource. Interaction with the users in a joint resource management approach would help both parties better to understand the dynamics of the resource. Monitoring should be done jointly and harvest quotas discussed periodically so as to satisfy the needs of both DWAF and the basket makers.

Lastly, could the demand for the material required by the market be satisfied by growing *Secamone* in suitable conditions outside the forest? If the demand were to grow beyond sustainable levels in the forest then such alternatives will have to be found. In anticipation of such a need DWAF should investigate alternatives together with current resource users.

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