Protocol for collecting data on bark-stripping and tree-cutting in the Maputaland centre of endemism

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Introduction

This document describes a protocol for collecting data on the occurrence and spatial patterns of bark stripping and tree cutting in the Maputaland centre of endemism. This information will be used to measure current levels of utilisation and to identify species that are most at risk of over-harvesting. It will also be used to model the spatial distribution of plant harvesting and this model will be incorporated into the Maputaland conservation planning system to allow the identification of less affected areas.

This data collection protocol describes three linked stages. The first stage involves developing a list of harvested tree species, the second involves determining where sampling transects should be located and the third involves recording the characteristics of trees belonging to the focal species. All three of these stages are described in more detail below.

1) Developing the tree species list

Developing the list of species to be studied first involves talking with local experts to identify which tree species are affected by bark stripping and stem cutting in the study area. A provisional list should be developed based on their advice and this should be circulated for comments amongst as many relevant people as possible. Local experts with a range of backgrounds (ie local resource-users, resource managers, botanists) should be consulted to ensure that any useful information is gathered. Fieldworkers should ideally be accompanied by a member of the local community when collecting data and this field assistant should also help to develop the draft list and gather relevant information.

This draft list should then be refined by carrying out an informal reconnaissance of the study site to ensure that each tree species is present and can be identified by the fieldwork team. Data should only be collected on tree species that are relatively abundant, so species that are not found during the initial reconnaissance should probably be excluded from the data collection process. The reconnaissance should also be undertaken with local resource-users to identify the different ways that trees may lose bark cover or be physically damaged.

2) Sampling design

Previous work has shown that the position of roads and fields are important in determining where plant harvesting takes place. Therefore, the best way to measure the effects of these influences is to sample in a belt transect running from roads or farmland towards more

"pristine" areas. These transects should be located by using a landcover map or satellite image to identify where each should start and which compass bearing it should follow (Figure 1). Some transects may pass close to unmapped roads or fields - this is only of concern when it affects more than half of the transects.

Figure 1a: Section of a Landsat image showing a number of roads, as well as subsistence agriculture and untransformed habitats. The untransformed habitats are generally greener and less fragmented

Figure 1b: The same Landsat section showing major roads (in dark grey) and possible transect locations (in red). These transects would sample the band of natural vegetation in the central part of the image.

When working in thick vegetation it might not be possible to follow a compass bearing, making it necessary to follow existing trails. In this case, the field worker should look for the trail that is closest to the predefined start location. They should then follow the trail but record that they are using a "recce transect" rather than a "belt transect".

The transect width should either be 5 or 10 metres, depending on the density of focal tree species (ie 5 m in forest, 10 m in woodland). Transects should ideally be distributed throughout the study area and should be at least 500 metres apart. The transect length will depend on the amount of plant harvesting that has been recorded, although they should be at least 200 m long and no more than 2 km. Once more than 200 m has been sampled, and if no signs of harvesting have been recorded for the previous 50 m, then the data collector should continue for another 50 m and stop sampling if no further signs are recorded.

3) Collecting data on the focal species

Data should be collected on all trees that belong to the list of key species, have a diameter at breast height (DBH) of more than 10 cm and fall within the belt transect. The following details should be recorded on the standardised data sheet:

Location

The X and Y coordinates of the tree should be recorded using a GPS unit, ideally using the GPS averaging function to increase accuracy. The location should be recorded in decimal degrees (eg 32.0012, -26.4654) using the WGS84 datum.

DBH

The diameter at breast height (DBH) of the tree should be recorded in centimetres using a tape measure. If the tree consists of several main trunks then each trunk should be measured and the DBH of each should be recorded. Data on each trunk should be recorded separately but indicate on the data sheet that they belong to the same tree.

Resource harvesting impact

The intensity of resource harvesting impact should be rated by visual assessment. For bark stripping, use a four-point scale based on the proportion of bark removed from the tree trunk below 1.3m from the ground. Give a score of 1 if **1-10%** has been removed, a score of 2 for **11-30%** removal, a score of 3 for **31-50%** removal and a score of 4 for **51-100%** removal.

Use a similar 4-point scale for estimating the percentage of the tree that has been removed by stem cutting. Give a score of 1 if **1-10%** has been removed, a score of 2 for **11-50%** removal, a score of 3 for **51-90%** removal and a score of 4 for **91-100%** removal.

Whenever possible, also record the reason for the tree being harvested by resource-users. For example, trees may be cut for fuel wood use or to access beehives as part of honey collection.

BE AWARE THAT TREES CAN BE BARK STRIPPED AND CUT BY A RANGE OF OTHER SPECIES AND ONLY RECORD THE IMPACTS OF HUMANS.