An inventory or census (stock survey) approach (Gronow and Safo, 1996; Wong, *et al*, 2001) was adopted to ascertain the relative abundance of forest and woodland resources along the transects. The surveyed transects followed the general direction of the main routes, including tracks, used by villagers when accessing some of their cultivated land, as well as forest products, as recommended by Brown and Lapuyade (2001). Due to financial constraints, only the route that is mostly frequently used was surveyed in each village that was included in the study. As explained later in this chapter, the participatory mapping exercise that was conducted during PRA, served the purpose of identifying this route. In all cases the surveyed transects were approximately perpendicular to homestead boundaries, as shown on figure 3.3, and it was possible to determine whether there was any relationship between distance from homesteads and tree density, species use, damage or even protection, since resource users are most inclined to travel the shortest possible distance when exploiting identified resources. This assumption is based on the finding that the intensity with which natural resources are exploited diminishes with increasing distance from homesteads. Research in Zimbabwe has generally demonstrated that the costs of collecting forest and woodland products systematically vary with distance from homesteads (Grundy *et al* 1993).

Along each transect data were collected on species type, use of species, type of non-timber forest products (NTFPs) derived from the species, as well as evidence and nature of human induced change. This provided information about the species which are important for the livelihoods of land reform beneficiaries. Each transect was approximately 500 metres long, the average distance within which most forest and

woodland products were originally drawn when the villagers were first resettled. The locations of the surveyed transects are shown on figure 3.3. The data that depicts the state of vegetation, including the density and frequency of tree species were recorded and for each transect the relative abundance of the species was computed using the following formula:

Relative Density of Species = $[\sum(\text{SP-TD})_s \div \sum(\text{SP-TD})_{as}] \times (\text{DWV}_h)$,

Where: $\sum(\text{SP-TD})_s$ = total of sampling point-tree distances for a given species found along a transect;

$\sum(\text{SP-TD})_{as}$ = total of sampling point-tree distances for all species along the transect;

DWV_h = density of trees along transect (all species included) per hectare; and

$\text{DWV}_h = \text{DWV}_{sm} \times 10000$;

Where: DWV_{sm} = the inverse of the squared mean sampling point-tree distances along the transect, expressed as number of trees per m^2.

Thus along any given transect, the square of the sum of the distances measured between sampling points and the nearest trees in all quarters is the total area occupied by the trees, while the density of the trees is simply the inverse of the squared mean of the distance between sampling points and the trees nearest to them, as measured along that transect. The actual collection of the data on tree spacing was done through the Point Centre-Quarter Method (PCQM), a plotless method, described in the Appendix.

Features that reflected woodland degradation or 'transformation', such as presence of trees which were recently physically damaged were also recorded. Trees that were

recorded as damaged included those that had recent ‘axe wounds’, lopped branches, stripped bark and those that were ring barked, partially debarked, pollarded, fire damaged, as well as those that exhibited similar forms of deformity, for example those whose roots were dug out. A comparison of the frequency of damage for different locations along individual transects and for different sections of the resettlement scheme was done and inferences drawn about the manner in which the degradation or transformation of forest and woodland resources is taking place spatially. The worksheet in Appendix IV was used for data recording, while table 3.5 provides information about the transects that were surveyed.