

1. Conclusions

One of the aims of this report was to outline developments with respect to the establishment of a spatial framework which would facilitate the selection of reference sites for use in the derivation of ecological reference conditions for rivers of Mpumalanga.

The three-tiered hierarchical approach adopted in this project has enabled the rivers of the Mpumalanga region to be grouped in one of seven identified ecoregions. Verification of these ecoregions will need to be undertaken once more detailed information has been collected, and will most likely be an iterative process, with ecoregions becoming more refined over time. This is, however, outside the scope of the current project, although information collected during this project will contribute to verification of the ecoregions.

Geomorphological zonation or sub-regional division of the main rivers and selected tributaries has enabled the identification of the zones present in each of these ecoregions. The analysis has also provided an indication as to the proportional representation of each zone within each ecoregion. Extrapolation from zoned rivers to ones for which geomorphological zonation is not yet known may be possible using the terrain morphology cover of the ENPAT97 series (Van Riet *et al.* 1997). This has not been done at this stage as it was beyond the scope of the report. However, complications are likely to arise where smaller rivers are concerned. Geomorphological zonation of rivers based on gradient calculated from digitised 1:250 000 covers is extremely time consuming and the potential to use an alternative method such as the digital terrain models for river zonation should be investigated.

As mentioned previously, identification of river types *a priori* proved to be problematic. The type of information needed for this level of the hierarchy, such as river size, geomorphological and biological characteristics, is best collected in the field. It is therefore suggested that river types be identified as part of subsequent ground-truthing or field verification phases. Components incorporated in the ecoregions such as terrain morphology, vegetation and geology may also prove useful contributors to the identification of river types.

The graphical information presented in this report related to ecoregions, geomorphological zones, terrain morphology, vegetation and geology for each secondary catchment has facilitated initial characterisation of each river with respect to these factors. The summary table of all named rivers at 1:250 000 or 1:500 000 scale (Table 4) provides details related to each river's "parent" river, ecoregion level 1, vegetation type, geological or lithostratigraphic type and hydrological type. Future selection of reference sites should be undertaken within these initial spatial components using hierarchical levels 1 and 2, together with level 3 river types identified during the ground-truthing phase.