EXECUTIVE SUMMARY

INTRODUCTION

The main purpose of the River Health Programme is to provide information regarding the overall ecological status of riverine ecosystems in South Africa. The programme focuses primarily on biological characteristics as indicators of river health using the following primary indicators and indices:

- communities of fish - Fish Assemblage Integrity Index (FAII) (Kleynhans, 1999);
- aquatic invertebrates - South African Scoring System (SASS 4) (Chutter, 1999) and,
- riparian vegetation - Riparian Vegetation Index (RVI) (Kemper, 2000 (in prep))

Most of these indices are either in a developmental stage or in the process of being refined. It is therefore crucial that testing, demonstration and integration of these different indicators take place to mould all the concepts into an operational programme

Mpumalanga province was used as the pilot area for conducting testing and demonstration. The provincial implementation initiative was made possible through collaboration and sharing of resources between the Mpumalanga Parks Board and the Kruger National Park, assisted by the Institute for Water Quality Studies, the Water Research Commission and the CSIR's Environmentek. The study focused on the Olifants, Sabie and Crocodile Rivers and monitoring commenced during late 1996 and was completed during 1999.

The design of the RHP allows comparisons between reference and monitoring sites or conditions. The question of where to monitor is, however, often problematic. This is particularly so in the case of establishing reference sites or conditions. One way to select representative sites so that they reflect the complete range of variation in river character is to geographically group riverine ecosystems on the basis of similarity between the catchments and subcatchments that they drain. Two approaches are currently followed in South Africa based on: 1) biogeographic (biotic) patterns (Eekhout *et al.*, 1996) and 2) delineation of ecoregions (DWAF, 1999). Both classifications need further refinement and validation.

The ecoregion approach was used in the Mpumalanga study. Ecoregional classification is a partially intuitive procedure that involves the delineation of regions with similar physical atributes. Eighteen preliminary Level I ecoregions are currently delineated for the country. The Olifants, Sabie and Crocodile River catchments span six of these ecoregions.

The institutions involved in the study identified the need to collate the information related to the location of sampling sites as well as the relevant data available for

each site into a single report. The intention with this inventory is not to duplicate the Rivers Database (Fowler *et al.*, 2000), but to present an overview of the extent of the monitoring network that was established during a particular project. The data contained in the Rivers Database are far more comprehensive than what is presented in this inventory. Users are advised to consult the Rivers Database for more detailed site information and associated biological, water quality and habitat data.

INVENTORY LAYOUT

The inventory contains information on each of the 201 monitored during these surveys as well as summaries of the three primary biological indicators that are used in the River Health Programme. The inventory layout gives definitions and descriptions of the terms used in the inventory.

The layout provides, at a glance, details of each site in terms of date sampled, physical location (province, river, quaternary catchment, latitude and longitude, ecoregion, 1:50 000 map code) and a brief description of how to get to a site. Information about fish and macroinvertebrates includes the method of sampling, habitats sampled, and whether historical information is available. Riparian vegetation information includes the width of the riparian zone, observations made in terms of the river channel, the surroundings and dominant species.

STUDY AREA

The study area covers the Olifants, Sabie and Crocodile River catchments which extend over the provinces of Gauteng, Mpumalanga and the Northern Province. A pull-out map of each of these catchments shows the monitoring and reference sites and the boundaries of each sampling authority. The Level I ecoregions are also indicated.

Olifants River Catchment

Ninety five sites were sampled on the Olifants River and 18 of its tributaries. The catchment covers an area of approximately 54 600 km^2. Altitudes range from 300 m at Mozambique border to 2 300 m above sea level in the Steenkampsberg Mountains near Lydenburg. The mean annual rainfall range between 500 – 1000 mm. Main types of land use in this catchment include power stations, agriculture, mining (concentrated on the eastern Mpumalanga coalfields), various industries and conservation areas.

Sabie River Catchment

Fifty nine sites were sampled on the Sabie River and 11 of its tributaries. The catchment is approximately 7 100 km^2 in size. The annual rainfall pattern is related to the topography and varies between 600mm and 2 000mm. The main land uses are irrigation and dry land farming, forestry in the upper catchment, conservation areas, and limited mining and industries.

Crocodile River Catchment

Forty seven sites were sampled on the Crocodile River and 8 of its tributaries. The Crocodile River drains an area of 10 400 km^2. The annual rainfall ranges from 500mm to above 1 600mm. This river system is not only one of the most economically productive catchments in South Africa, it is also one of the most biologically diverse. Land use in the catchment is concerned mainly in the different agricultural sectors which include forestry, game farming, dry land and irrigation and trout aquaculture and conservation areas.