



# RIVER HEALTH

The River Health Programme, under custodianship of the Department of Water Affairs and Forestry (DWAf), the Department of Environmental Affairs and Tourism and the Water Research Commission, monitors, assesses and reports on the biological condition of river ecosystems and the human-induced disturbances affecting them. This information will be used to support sound river management, as well as inform and educate South Africans regarding the health of our rivers. The EcoStatus of the majority of the study units surveyed in the Crocodile (West) Marico Water Management Area (WMA) is **POOR**.

About 25% of the Gross Domestic Product of South Africa originates from this highly developed WMA. The industrial, mining and agricultural sector depend on and place high demands on the water resources in this area.

## THE ECOLOGICAL ASSESSMENT OF RIVERS

The monitoring and assessment of the environmental condition, by using certain indicators, provide essential feedback on the state of our river systems.

The **ecological indicators** that form part of the RHP, include:

- In-stream Habitat Integrity** - Impacts on in-stream features such as the modification of the volume of water, change in the flow regime (i.e. natural flow patterns), bed and channel modification, water quality, alien water plants, alien fauna that influences habitat directly and waste disposal.
- Riparian Zone Habitat Integrity and Riparian Vegetation Integrity** - Impacts on riparian features such as the modification of the volume of water, change in the natural flow patterns, channel modification, water quality, reduction in vegetation and invasion by alien plants.
- Fish Assemblage Integrity** - Characteristics of a fish assemblage portray longer-term changes in the condition of river habitats. These changes may be in response to alteration in river flows, changes in river structure or changes in the chemical composition of the water.
- Macro-invertebrate Integrity** - Indicators of changes in water quality and habitat conditions over the short term. Aquatic macro-invertebrates include beetles, mussels, snails, crabs, worms and insect larvae.
- Water Quality** - Conclusions from water quality preferences of dominant diatom species are used to support the assessment of water quality. Each diatom species has a specific water quality preference and tolerance.

The state of these indices are described in terms of a **health category** ranging between natural and poor, as described in the table below:

RIVER HEALTH CATEGORISATION	
CATEGORY	DESCRIPTION
Natural	No or negligible modification of in-stream and riparian habitats and biota
Good	Ecosystem essentially in good state; biodiversity largely intact
Fair	Sensitive species may be lost, with tolerant or opportunistic species dominating
Poor	Mainly tolerant species present or alien species invasion; disrupted population dynamics; species are often diseased

Together with other information about river ecosystems, we improve our understanding of the functioning of these resources and how to protect them while allowing for economic and social development. Other information include:

- The **Ecological state (EcoStatus)** which gives an overall impression of the ecological health of a river and is an indication of the capacity of the system to provide a variety of ecosystem services; and
- The **Ecological importance and sensitivity** which provides an indication of whether a river should receive a high level of protection or not.

## IMPACTS AND MANAGEMENT ACTIONS

It requires specific management actions to ensure that the capacity of our rivers do not exceed sustainable levels. These management actions include:

- Minimise future development within the riparian zone. Control and manage existing activities such as urban development, road construction, grazing and mining activities which, sometimes irreversibly, change the structure and functioning of the riparian zone 1, 2, 3, 4, 5, 10
- Clear alien vegetation 1, 5, 6
- Set water resource quality objectives for the rivers and monitor to ensure compliance 1
- Improve farming practices: water abstraction; agricultural return flows pollute water resources 1, 3, 7
- Adhere to licensing conditions for discharges 1, 7, 8, 10, 11
- Upgrade sewage systems and improve their management 1, 10
- Characterise, delineate and classify seeps, springs and palustrine wetlands within the WMA in order to derive their protection status 1, 3, 5, 9
- Manage surface runoff at the source - impervious surfaces (roads, paving, roofs, etc.) that accompany urban development cause water that would naturally percolate into the ground to form rapid flowing surface runoff 1, 7, 10
- Control alien flora and fauna - alien fish cross breed and their feeding behaviour alter in-stream habitat 5
- Install fish ladders and weirs in flow regulating structures - allow natural migration patterns; improve functional connectivity 5
- Release water from dams to simulate natural flow patterns 1
- Implement in-stream flow objectives; classify rivers to determine protection level required 1

## RESPONSIBLE AUTHORITIES AND INDIVIDUALS

- |   |  |   |
|---|--|---|
| 1 Department of Water Affairs and Forestry        | 5 Provincial Departments of Conservation and Environmental Affairs | 9 Rural communities   |
| 2 Department of Environmental Affairs and Tourism | 6 Working for Water  | 10 District and Local Municipalities                                |
| 3 National Department of Agriculture              | 7 Landowners, farmers  | 11 Industry and Mining  |
| 4 Department of Minerals and Energy               | 8 Developers   | 12 Water User Associations and Future Catchment Management Agencies |

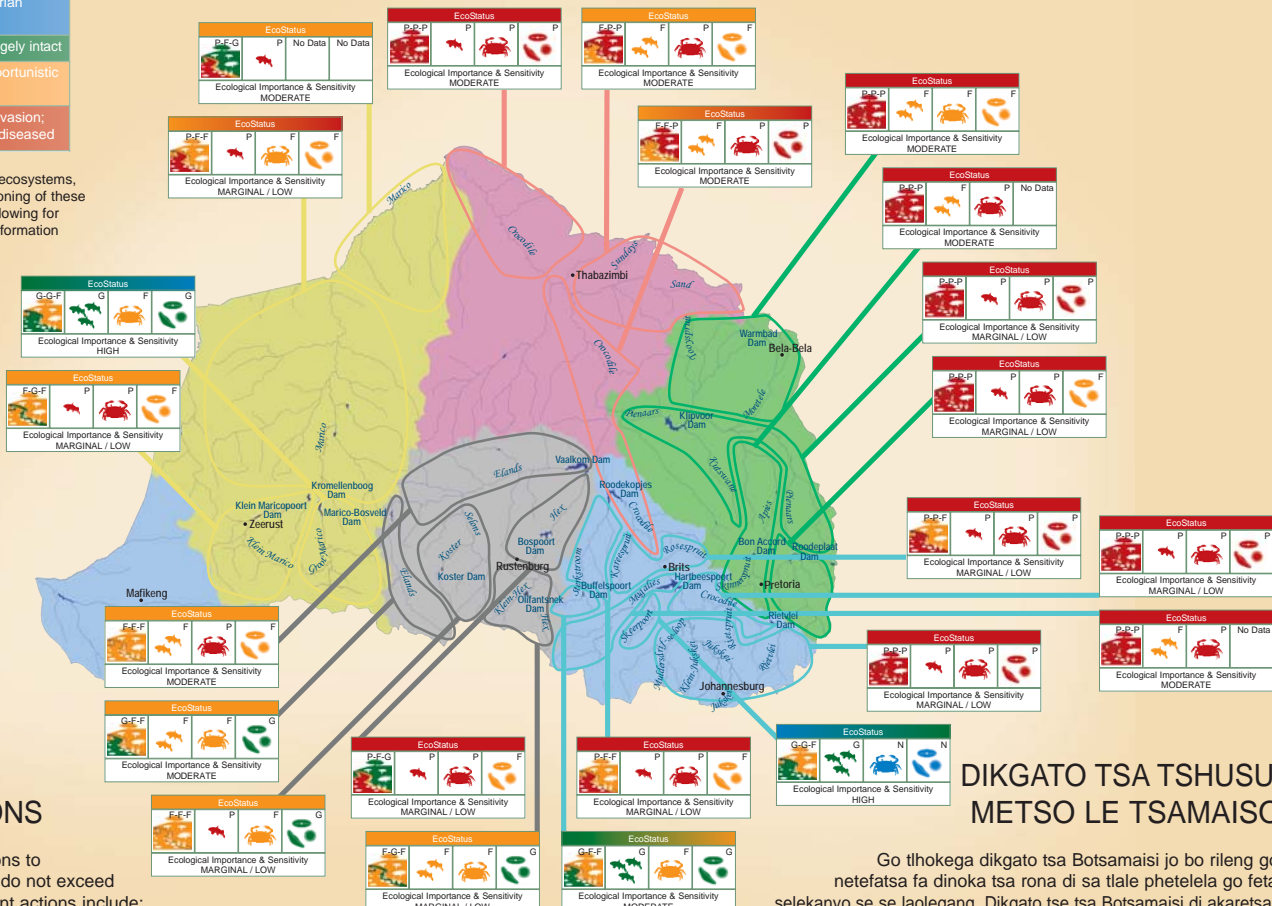
Lenaane la boitekanelo jwa dinoka le le ka fa tlase ga Lefapha la Merero ya Metsi le Jalo ya Dikgwa le Lefapha la Merero ya Tikologo le Bojanala le Baelathoko ba Khomišene ya Dipatlisiso tsa Metsi, le sekaseka le bo le begela ka ga maemo a boitekanelo a tikologo le dinoka, maemo a thago a dinoka, ga mmogo le ditiro tsa batho tse di koafatsang metsi a dinoka tsa rona. Kitsiso e, e tshetsetsa tsamaiso e e tokafatseng ya dinoka, e bo e sedimosetsa le go ruta MaAforikaborwa ka ga pholo mo dinokeng tsa rona. Dipatlisiso ka maemo a thago a noka e, di kailwe e le tse di **BOKOA**.

Bokana ka diperesente di le masome a mabedi thano tsa ntsho-kuno ya Aforikaborwa, e thagiswa go tswa mo mafelong a a thabologileng. Madirelo, meepo le mafelo a temothuo a ikaegile ka didiriswa tsa metsi a lefelo le.

This poster is a summary of the tenth South African *State-of-Rivers Report: Monitoring and Managing the Ecological State of Rivers in the Crocodile (West) Marico Water Management Area*. It illustrates some of the major findings from biomonitoring surveys that took place during April to August 2004. This study was conducted by the RHP Task Teams of Gauteng, North West and Limpopo, together with DWAf: RQS.

Lenaane le ke tshoboko ya pegelo ya bolesome ya seemo sa dinoka mo Aforikaborwa. E ela thoko thokomelo le tsamaiso ya dinoka mo ditikologong tsa (Crocodile) Bophirima ya Marico ya tsamaiso ya metsi. E thagisa dingwe tsa dipithhelelo tse dikgolo tse di dirilweng ke boelathoko le bobatlisisi ba ditshedi, e e tsereng karolo ka Moranang go fitlha ka Phatwe 2004. Dipatlisiso tse, di diragaditswe ke dithopha tsa RHP tse di kwa Gauteng, Bokone bophirima le Limpopo, ga mmogo le DWAf: RQS.

## PRESENT ECOLOGICAL STATE



## DIKGATO TSA TSHUSU-METSO LE TSAMAIISO

Go thokega dikgato tsa Botsamaisi jo bo rileng go netefatsa fa dinoka tsa rona di sa tlale phelelela go feta selekanyo se se laolang. Dikgato tse tsa Botsamaisi di akaretsa:

- Lekanyetsa dithabololo tsa isago go ikala mo lebopong. Laola le go tsamaisa ditiro tse di akaretsang thabololo ya seteropo, go dira ditsela, phulo le meepo, tse di fetolang tiriso ya leboho la dinoka gothelele. 1, 2, 3, 4, 5, 10
- Go tlosa dimela tse di sa batlegeng 1, 5, 6
- Go thagisa maikaelelo a a ikaeletsweng ka dinoka le go netefatsa gore go tsamaiwe go ya ka molao 1
- Go tokafatsa mekgwa ya temothuo le go ela thoko mekgwa e e kgoreletsang dipelo tsa temothueng le go kgothela metsi 1, 3, 7
- Go tsamaisana le maemo a dilaeense a a laolang madirelo 1, 7, 8, 10, 11
- Go thabolola mekgwa le tsamaiso ya kgeleloeswe 1, 10
- Kaya sebopego, go thalosa le go farologanya mesela ya metsi, meedi le lafathe fa le tswedisang le go thagisa maemo a tsona a tshireletsego 1, 3, 5, 9
- Thokomela lefathe gore go se nne le kgogolego e e tholwang ke go agiwa ga ditsela le go alwa ga lefathe mo metsesetoropong, tse go ya ka thago di ka feletsang di nna le ditlamorago tse di sa siamang mo metsing a ka thago a eelano mo lefatsheng 1, 7, 10
- Go laola dimela le dithapi tsa seeng, le le mekgwa ya tsona ya go fetola maemo le manno a tsona mo melatswananeng 5
- Thoma matlowa le mekgwa-taolo mo metsing e e laolang kelelo ya ditshidi tsa metsi, le go bona gore di thwaela bonno jwa tsona sentle 5
- Ntsha metsi kwa matamong go elela mo dinokeng ka tsela ya thago. Thomamisana dithokego tsa kelelo mo tikologong jaaka lenaane le le beetsweng kwa thoko la thago 1
- Go tsenya tirisong maitlamo le go thola gore a dinoka tse di sireletsegile 1

Crocodile (West) Marico Water Management Area

River Health Programme

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