

WHAT IS RIVER HEALTH?

Healthy rivers provide benefits to society. The River Health Programme (RHP) is a national initiative that monitors the state of river ecosystems by collecting and distributing information on the health of rivers in South Africa. This information helps water resource managers and society to make better decisions about the use of our rivers.

This poster is a summary of present health of the rivers in the Free State, negative impacts on these rivers and actions we can take to mitigate negative impacts. The information provided here is based on river health surveys conducted between 2000 and 2003.

RIVERS IN THE FREE STATE LANDSCAPE

Many of the rivers in the Free State meander across a fairly flat landscape (between 1000 and 1500m above sea level), but originate at high altitudes (of around 3000m) in the Drakensberg and Lesotho highlands. They traverse a wide diversity of habitats, from the great escarpment mountains and highveld in the east and centre, to karoo veld and Kalahari bushveld in the west. Rain falls in the form of summer thunderstorms and river flow is seasonal. Rainfall is highest in the east, but the area is relatively hot and dry.

People rely on rivers to sustain a wide range of activities, including agriculture (e.g. wheat, maize, sheep cattle and gamefarming; agriculture covers about 90% of the study area), urban requirements (e.g. domestic water for Mangaung Municipality, comprising Bloemfontein, Botshabelo and Thaba Nchu), mining (gold and coal) and manufacturing.

RIVER HEALTH PARTNERSHIPS IN THE FREE STATE

The River Health Programme (RHP) in the Free State started operating in 1996 and today has a monitoring strategy and growing database with river health information for each of the major rivers in the province.

The Free State RH team has been able to set up biomonitoring strategies for all the rivers because the responsibility for river biomonitoring is shared between several partners. The provincial Department of Tourism, Environmental and Economic Affairs, the regional office of the Department of Water Affairs and Forestry, the Centre for Environmental Management at the University of the Free State and the Water Boards, namely Rand Water, Bloem Water and Sedibeng Water are all active participants in biomonitoring. Local municipalities have also started to link with the RHP.

Each partner contributes but also benefits from the information and knowledge generated by the biomonitoring initiative. The RHP in the Free State is thus a co-operative initiative. By working together and sharing responsibilities, information and experiences, the participating group achieves much more than they would by working in isolation.

WHAT IS IMPACTING OUR RIVERS?

Rivers are useful to people, but use often results in impacts. People must decide which types and levels of impacts are acceptable and do not impact unfairly on others' ability to benefit from a river. The map and icons indicate river health and highlight areas where impacts may need to be managed more carefully. The text below describes some of the drivers of poor river health in the Free State.

Urban and informal developments. Domestic waste from homes (such as sewage) deposited in rivers. People use rivers to wash cars, clothes and dump unwanted waste, leading to deterioration of river health. Also, sometimes sewerage treatment works cannot cope with their loads with the result that sewerage ends up in rivers.

Mining activities. Mine water, which contains chemicals, is dumped into rivers, causing more harm to animals living in the river, plants and people. Mining activities contribute to the removal of underground water. Sand mining often destroys river banks and stream habitats.

Industries. Industrial waste is discharged into our rivers, causing damage because of the chemicals contained in them.

Agriculture. Some agricultural practices have a negative influence on our rivers. Overgrazing can lead to soil erosion, resulting in dramatic changes in river habitats. Water flow from agricultural activities often contain high salt loads, nutrients and even chemicals used for killing pests in the farms (pesticides). Wastewater from farms is also sometimes discharged into rivers. (Bulk abstraction not a problem?)

Alien species. Alien plants such as the willow, blue gum and poplar trees invade the riparian habitat resulting in increased soil erosion and water use by these plants. Alien fish including the large-mouth yellow fish eat indigenous small animals, outcompete other species and dominate the stream.

River impoundment and water transfer. Dams and other structures such as weirs disrupt the natural river flow, resulting in changed river habitats and disruption of ecological processes such as fish migration. The Free State has numerous water transfer schemes and these result in altered flow, often resulting in soil erosion.



Management properties	
Natural	Relatively little human impact.
Good	Human-related disturbance, but the ecosystem is essentially in good state.
Fair	Multiple disturbances associated with the need for socio-economic development.
Poor	High human concentration, natural functioning is disrupted.

RH Categories	Management properties
Fish are good indicators of the long-term influence on a river and habitat conditions.	Relatively little human impact.
Describes the in-stream availability and diversity of habitat.	Human-related disturbance, but the ecosystem is essentially in good state.
Healthy riverbanks maintain the form of the river channel, and provide habitat for species and filter sediment, minerals and light.	Multiple disturbances associated with the need for socio-economic development.
Describes the condition of the river channel and its functionality for transporting water and sediments.	High human concentration, natural functioning is disrupted.
The presence of insects, mussels, snails, crabs as well as worms is used to assess the overall quality of the water.	

TOURISM AND THE FREE STATE RIVERS

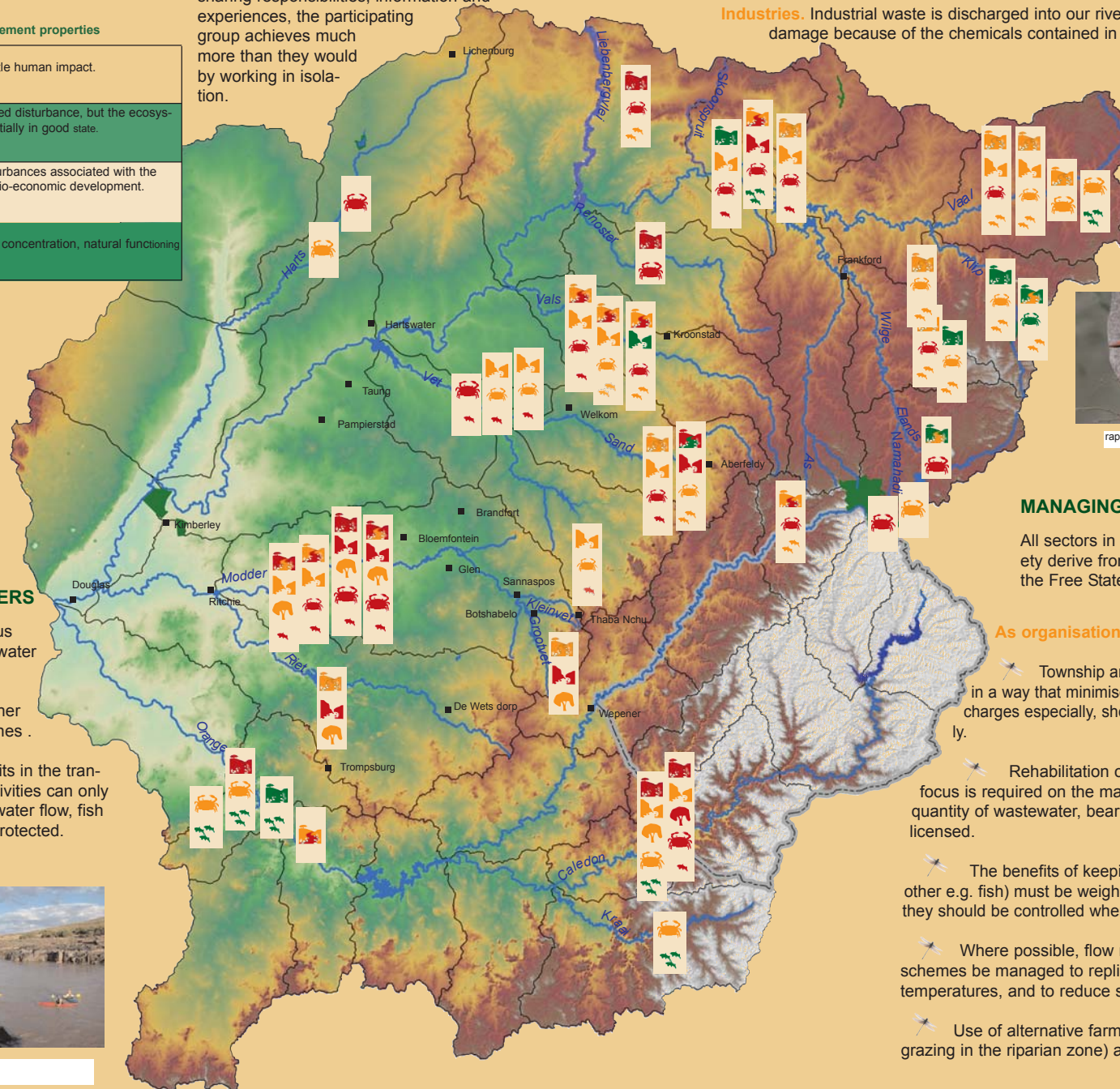
Rivers in the Free State offer people numerous opportunities for sport and recreation. White water rafting, canoeing, kayaking, snorkelling and fly-fishing are popular here. People are also attracted by opportunities to see birds and other wildlife associated with rivers and riparian zones.

Many people want to experience these benefits in the tranquil surroundings offered by rivers. These activities can only be sustained if river health features such as water flow, fish habitats and healthy riparian vegetation are protected.



Pierre's classic fly-fishing

caption



Several species in the study area, associated with rivers and river habitats, are threatened according to the IUCN Red data criteria.

Species (common name)	Species (scientific name)	Status
Largemouth yellow fish	<i>Labeobarbus kimberleyensis</i>	Vulnerable
White backed night heron	<i>Gorsachius leuconotus</i>	Vulnerable
Bittern	<i>Botaurus stellaris</i>	Critically endangered
Whitewinged flufftail	<i>Sarothrura ayresi</i>	Critically endangered
African finfoot	<i>Podica senegalensis</i>	Vulnerable
Half collared kingfisher	<i>Alcedo semitorquata</i>	Near threatened
Aloe	<i>Aloe</i>	?



replace with another picture.

MANAGING OUR RIVERS

All sectors in society can contribute towards the improvement of river health and the benefits society derive from rivers. Below are some of the actions that can be taken to improve river health in the Free State.

As organisations

Township and town developments should be constructed in a way that minimises negative impacts on rivers. Sewage discharges especially, should be managed more effectively and efficiently.

Rehabilitation of mining sites should be planned. Particular focus is required on the management and control of the quality and quantity of wastewater, bearing in mind that such activities must be licensed.

The benefits of keeping invasive alien organisms (vegetation and other e.g. fish) must be weighed up against the cost of keeping them, and they should be controlled where appropriate.

Where possible, flow releases from dams should and transfer schemes be managed to replicate natural flow patterns and natural water temperatures, and to reduce soil erosion.

Use of alternative farming methods (for example limiting livestock grazing in the riparian zone) and water conservation management.

As an individual

The use of sustainable fishing methods should be implemented, to ensure that viable fish populations are protected so as to ensure future use.

Remove solid pollution (e.g. plastic packets) from rivers where possible.

When herding livestock, the movement of animals should be regulated by a herder, in order to guide them around to limit negative impacts on rivers, such as overgrazing in the riparian zone and erosion on river banks.

Wash cars, clothes and other material away from the river, using containers/buckets where possible, so that detergents containing harmful chemicals do not end up in the river.

