

# river health

# Ecological State of Cape Town's Rivers

## RIVERS IN THE GREATER CAPE TOWN AREA

The Steenbras, Sir Lowry's Pass, Lourens, Eerste/Kuils, Sand, Zeekoe, Schusters, Else, Hout Bay, Salt, Diep, Sout and Silvermine rivers fall within the greater Cape Town area. These rivers rise in the high mountain ranges of the Hottentots Holland Mountains in the east and Table Mountain and Cape Peninsula Mountains in the south west.

Urban development is the predominant land-use in the low-lying areas, with the Cape Flats being the most densely populated. Other major land-use activities are conservation (Table Mountain National Park) in the south, irrigated agriculture (vineyards) to the east and dryland agriculture (wheat) in the north.



## IMPACTS AND PROPOSED MANAGEMENT ACTIONS

### RIVER MODIFICATION

Many of Cape Town's rivers suffer from habitat loss due to canalisation. This is most evident in the densely populated urban areas surrounding the Black, Elsieskraal and Keyzers rivers. The Big and Little Lotus rivers, which are largely artificial, are canalised along most of their reaches. Straightening and deepening of channels also occur as a result of invasive alien plants. This has reduced the availability of habitat for aquatic life. The river's ability to attenuate floods and decompose pollutants is also reduced by canalisation.

#### Management Actions

- Restore the natural channel shape and reintroduce meanders in rivers. Discourage additional canalisation.
- Introduce indigenous riparian and instream vegetation to beautify the river and improve water quality.
- Create habitat diversity (pool and riffle/runs) to provide refuge areas for aquatic life.
- Restore substrate diversity (rocks, pebbles, gravel, sand, mud) to increase biotic diversity.



### WASTEWATER DISCHARGES AND RUNOFF

Stormwater runoff and litter from the urbanised areas surrounding the Lotus and Diep (Cape Flats), Bokramspruit (Oceanview), Sir Lowry's Pass (Sir Lowry's Pass Village) and Eerste (Kyamandi) rivers have severely deteriorated the water quality in these rivers. In addition, wastewater discharges and spills from blocked sewage pump stations in the Kuils and Black/Vygekraal rivers have resulted in serious water quality problems. This and other sources of urban pollution pose a risk to human health (eg. diarrhoea).

#### Management Actions

- Improve monitoring and management of stormwater runoff and wastewater discharges and spills.
- Involve communities in initiatives to improve river health (Adopt-a-river or contact your local 'friends' group).



### ALIEN SPECIES INFESTATION

Invasive alien fish eg. barbel, carp, tilapia are widespread in the lower reaches of nearly all of Cape Town's rivers and these species compete with the indigenous Cape galaxias and Cape kurper for food and habitat. This has reduced the numbers and distribution of indigenous fish.

A variety of alien aquatic weeds (water hyacinth, water lettuce, azolla, parrot's feather) have invaded many of Cape Town's rivers, particularly the Black, Lotus, Sand and Eerste/Kuils rivers. The removal of riparian indigenous vegetation has led to invasion by alien plants (kikuyu, poplar, wattle). Alien plants cause a reduction in habitat integrity.

#### Management Actions

- Clear alien vegetation along and in the rivers and maintain these cleared areas.
- Maintain green belts/buffers along the river corridors and re-introduce indigenous riparian vegetation to act as a buffer between the river and surrounding areas.
- Remove invasive alien fish from rivers.
- Support the Integrated Aquatic Weed Control Programme which manages the removal of nuisance aquatic plants.

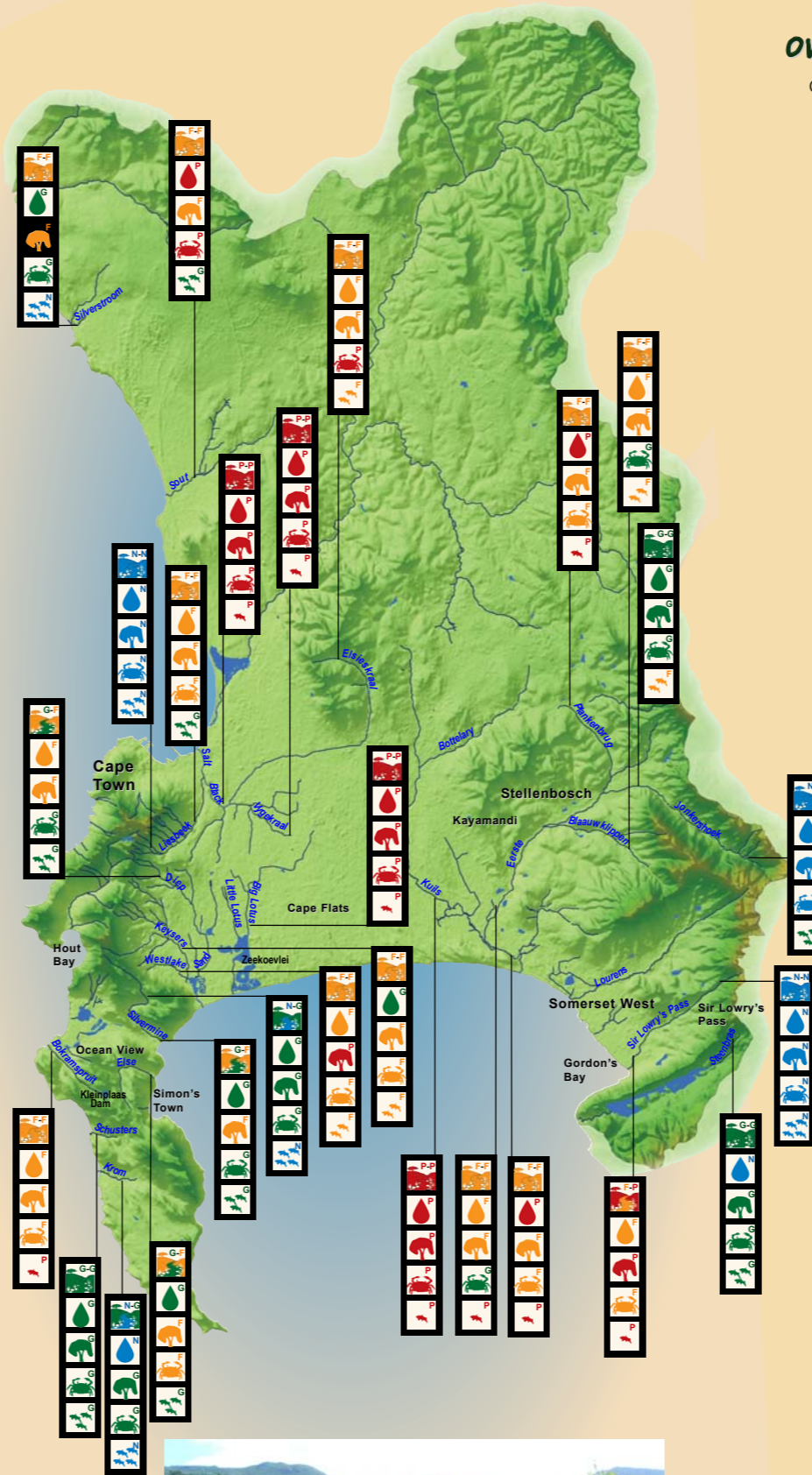


### FLOW MODIFICATION

A reduction in summer low flows in the Sand, Sir Lowry's Pass and Silvermine rivers occurs as a result of alien invasive plants and water abstraction. However, flow in the Kuils River has more than doubled as a result of wastewater discharges, while the flow regime of the Eerste River has been altered by the inter-basin transfer of water from Theewaterskloof / Kleinplaas Dam. The cumulative effect of small dams in the catchment is also significant, particularly in tributaries of the Eerste River. These modifications to flow have reduced the availability of habitat in rivers for aquatic life.

#### Management Actions

- Implement monitoring and control measures on existing water abstraction from the Sand and Sir Lowry's Pass rivers.
- Discourage new abstractions from Cape Town's rivers in summer, instead store winter water for use in summer.
- Ensure environmental flow releases are made from dams.
- Explore ways to reduce the volume of water in the Kuils River (i.e. the reuse of treated wastewater).



## OVERALL STATE OF CAPE TOWN'S RIVERS

Generally, only a few of the upper reaches of the rivers in the greater Cape Town area are still in a natural or good ecological state. Development in the lowland areas has modified the rivers, resulting in their poor ecological state. Significant stretches of most rivers have been canalised, have poor water quality, modified flows and abundant alien fish and plant life. The ecological functioning and delivery of goods and services by these rivers have been severely reduced. Many rivers require rehabilitation.

## What is River Health?

Healthy rivers provide goods and services (eg. water supply, breakdown of pollutants, conservation, flood attenuation, natural products, recreation and spiritual rituals) which contribute to human welfare and economic growth. When people use rivers, they impact on river health. The National River Health Programme assesses the health of rivers by measuring selected ecological indicator groups that represent the condition of the larger ecosystem. The data are simplified and represented as indices (see below). This poster is a summary of data collected during 2004 and 2005 (See River Health Programme (2005): State of River Report: Cape Town River Systems, obtainable from the Department of Water Affairs and Forestry at the contact details given below).

River Health Categories		
River Health Category	Ecological Perspective	Management Perspective
Natural N	No or negligible modification	Relatively little human impact
Good G	Biodiversity and integrity largely intact	Some human-related disturbance but ecosystems essentially in good state
Fair F	Sensitive species may be lost; with tolerant or opportunistic species dominating	Multiple disturbances associated with the need for socio-economic development
Poor P	Mostly tolerant species; alien species invasion; disrupted population dynamics; species often diseased	High human densities or extensive resource exploitation

Indices of River Health		
	Index of Habitat Integrity (IHI)	A measure of the in-stream availability and diversity of a habitat.
	Water Quality (WQ)	Indicates the suitability of water for aquatic ecosystems. Based on the total phosphate, total nitrogen, ammonia, suspended solids and dissolved oxygen measured in water samples.
	Riparian Vegetation Index (RVI)	A measure of the degree of modification of the river bank vegetation from its natural state.
	South African Scoring System (SASS)	Index based on the aquatic invertebrates (e.g. crabs) found at a site. Indicates the localised river condition.
	Fish Index (FI)	Measure of the fish diversity deviation from its natural state, indicating the long term impacts on the general habitat.

## WATER FOR A SUSTAINABLE FUTURE

Everyone lives in river catchments, uses water sourced from rivers and should take responsibility for looking after them. By doing this, we will ensure that we can continue to use and benefit from rivers now and in the future.

Current water demand already exceeds the water yield available for the Cape Metropolitan Area. Water is thus our most precious resource and we need to use it wisely. Some tips for saving water are:

- Adhere to water restrictions
- Re-use bath and sink water to water your garden
- Check and repair all water leaks
- Place a 'hippo' bag or filled plastic bottle in your toilet cistern
- Take a 5 minute shower instead of a bath
- Fit new houses with water saving devices

Well point and borehole users are encouraged to adhere to water restrictions. The cumulative effect of many abstractions from rivers and groundwater has a significant impact on river flow. Groundwater is particularly important in contributing to the flow of rivers in summer which provides refuge areas for aquatic life. Well points and boreholes should not be established in the riparian zones, lakes and estuaries.



Red Water nzi Amdaka bedelde Water		
No Swimming	Swem Verboed	Sukugubha
No Drinking	Moenie Drink Nie	Sukusela
No Fishing	Green Vlawang	Sukulobo
	Moenie Rommel Breek nie	Sukugotla

