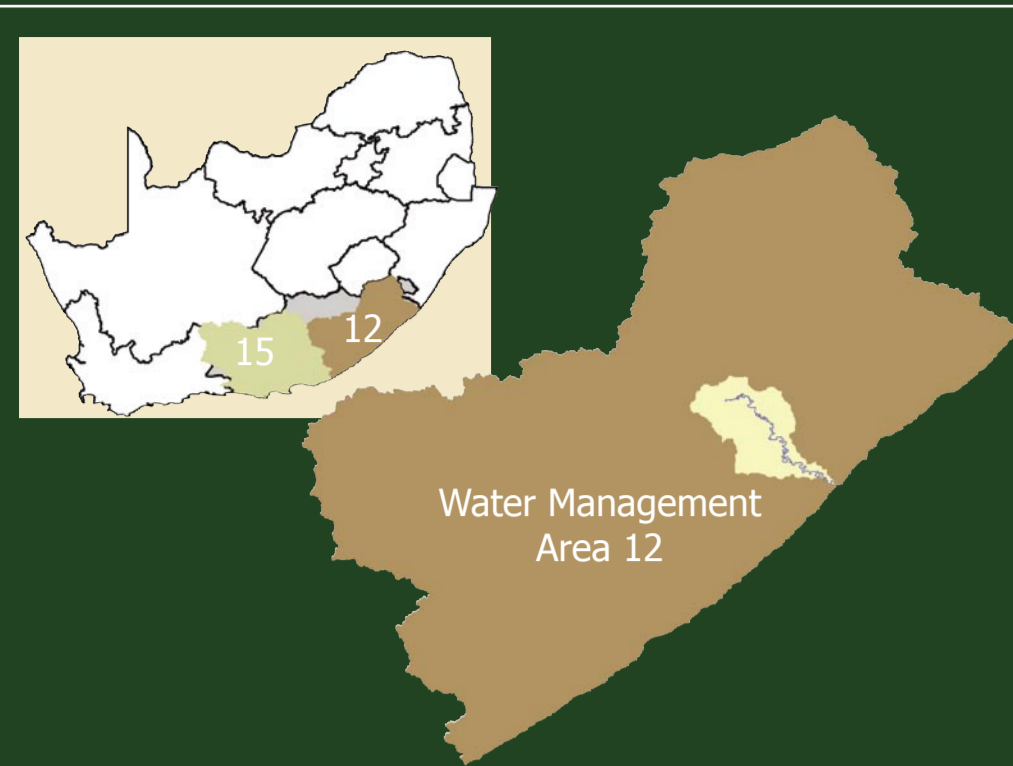


River Health Programme - Mthatha River



The Mthatha River catchment is roughly 100 km long and 50 km wide and covers an area of just over 5 520 km². It lies in Water Management Area 12 which is bordered by the Keiskamma River in the southwest and Mzimvubu River in the northeast.

This poster is a summary of the State-of-Rivers Report: Mthatha River System and forms part of the second series of products that will eventually cover all of the river systems in the Eastern Cape. It illustrates some of the major findings from biomonitoring surveys that took place between 2004 and 2006.



What is the River Health Programme?

The River Health Programme monitors, assesses and reports on the biological condition of river ecosystems and the human-induced disturbances affecting them. This information regarding the ecological state of South Africa's river ecosystems is used to support the management of rivers.

Why do we need to protect our water resources?

"Water is the natural resource most fundamental to human and wildlife survival. In South Africa water is a scarce and precious commodity and efficient management of our water resources has a direct bearing on our standard of living and economic benefit."

"Rivers have a natural ability to resist negative changes induced by humans. There are however limits beyond which this capacity can become overloaded. If these limits are exceeded for extended periods, a river will lose its ability to adapt to changes and to restore or rehabilitate itself. It will lose its value as a habitat for plants and animals, lose important functions and, ultimately, become worthless to people as a natural resource."

Taken from the report *Achievements of the River Health Programme 1994 - 2004: A national perspective on the ecological health of selected South African rivers* which can be obtained at DWAF: RQS:

Measuring River Health

EcoStatus is a measurement of the overall health of a river system, in terms of its ability to support natural plants and animals, and its capacity to provide a variety of goods (e.g. timber, food, medicine) and services (e.g. purification, degradation of organic matter). The ecological importance and sensitivity provides an indication of whether a river should receive a high level of protection or not. The ecological indicators that form part of the RHP, include:



Geomorphology and hydrology - Geomorphological processes determine river channel morphology which provides the physical environment which stream biota live in. Geomorphological and hydrological changes are associated with erosion, increased sediment, declining water quality and altered stream hydraulics.

Habitat - The availability and diversity of habitats (in-stream and riparian areas) are important determinants of the biota that are present in a river. Impacts that could influence river habitat include water volume changes, natural flow pattern changes, bed and channel modifications, water quality deterioration, alien water plants and waste disposal.

Macro-invertebrates - Aquatic invertebrate communities respond relatively quickly to localised conditions in a river, especially water quality and habitat diversity. These communities are common, have a wide range of sensitivities, and have a suitable life-cycle duration that indicates short to medium-term impacts of water quality.

Fish - Fish are relatively long-lived and mobile, so they indicate longer-term changes in the condition of river habitats due to changes in river flow, river structure or the chemical composition of the water.

Riparian Vegetation - A healthy riparian zone maintains channel form and serves as an important filter for light, nutrients and sediments. It regulates river flows, improves water quality, provides habitats for fauna and corridors for their movements, controls river temperature and maintains bank stability. Changes in the structure and function of riparian vegetation commonly result from changes in the flow regime of a river, exploitation for firewood, or use of the riparian zone for grazing or ploughing.

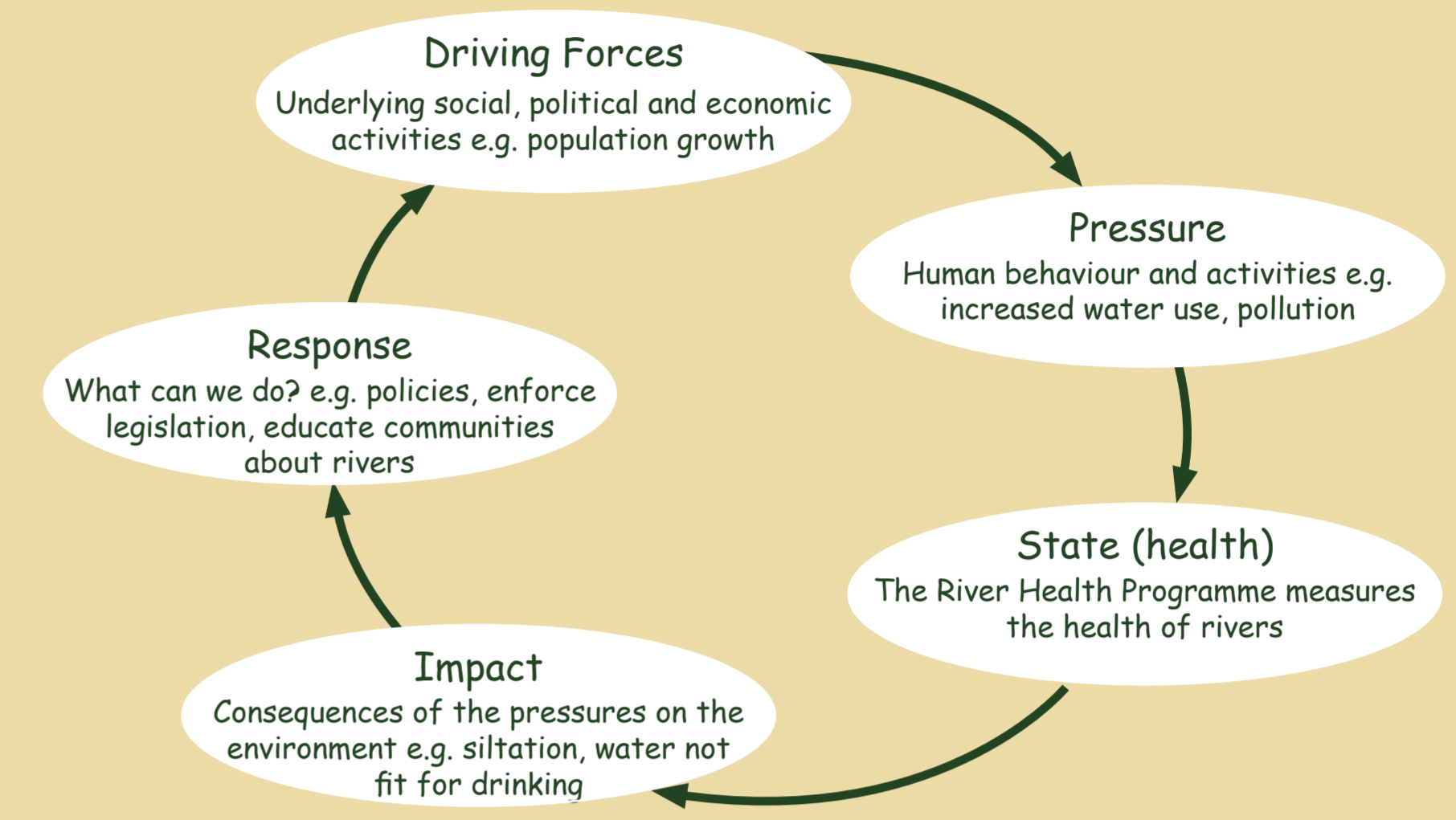


River Health categories are associated with varying levels of present ecosystem health and the potential of an ecosystem to offer particular goods and services (see table below). A section of a river in a natural class may be more suitable for conservation and tourism, while a river in a good class may have recreational potential. A river in a fair class may have lost much of its capacity to be a reliable and good quality source of water while rivers in a poor class have little or no capacity remaining to support any ecological goods or services. River health categories thus represent a combination of human impacts. Resource managers have to take decisions concerning these impacts, in the knowledge that the consequences for the river ecosystem may be irreversible.

Ecological (Reserve) categories	River Health category (indicated with colour)	Description
A	Natural	Unmodified natural
B	Good	Largely natural with few modifications
C	Fair	Moderately modified
D	Poor	Largely modified
E	Seriously modified	Seriously modified
F	Critically modified	Critically or extremely modified

How can we improve the health of our Rivers?

The State-of-Rivers reporting in South Africa uses the DPSIR framework to explain how good or bad river health is, and what we can do to improve the situation. This diagram represents a simplified explanation of the DPSIR framework.



The River Health Programme (RHP) in the Eastern Cape

The Eastern Cape RHP Champion and Provincial Task Team (PTT) has the responsibility for implementing, improving and maintaining the RHP in the province. To achieve this, the PTT needs to identify and align the efforts and resources of collaborating institutions and make roles and responsibilities explicit. Also, participating organisations should show their commitment to the RHP and PTT by including biomonitoring in their business plans; and by supporting and endorsing the involvement of their staff members.

A number of organisations have been instrumental in the implementation and funding of the RHP in the Eastern Cape. The Department of Water Affairs and Forestry is leading the programme in the Eastern Cape. Partnerships between government departments, municipalities, water boards, centres of learning, research organizations and local communities ensure a sustainable foundation for the River Health Programme through participation,

capacity building, knowledge sharing and knowledge transfer. River Health Programme partners in the Eastern Cape include: Department of Water Affairs and Forestry; Department of Education; DEDEA – Biodiversity and Marine and Coastal Management Directorate; District Municipalities and Local Municipalities; Nelson Mandela Metropole University, Walter Sisulu University, Rhodes University and Fort Hare University; Eastern Cape Parks Board; Eskom; and CSIR.

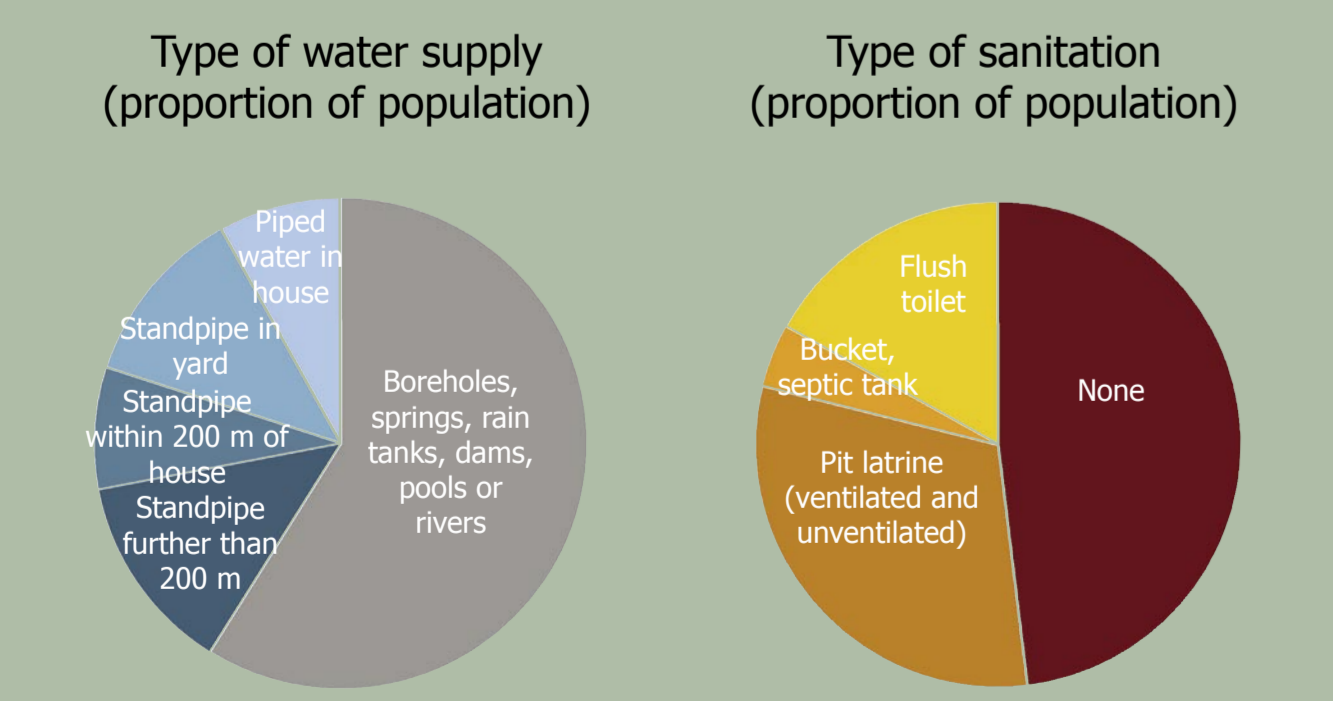


Social and economic profile

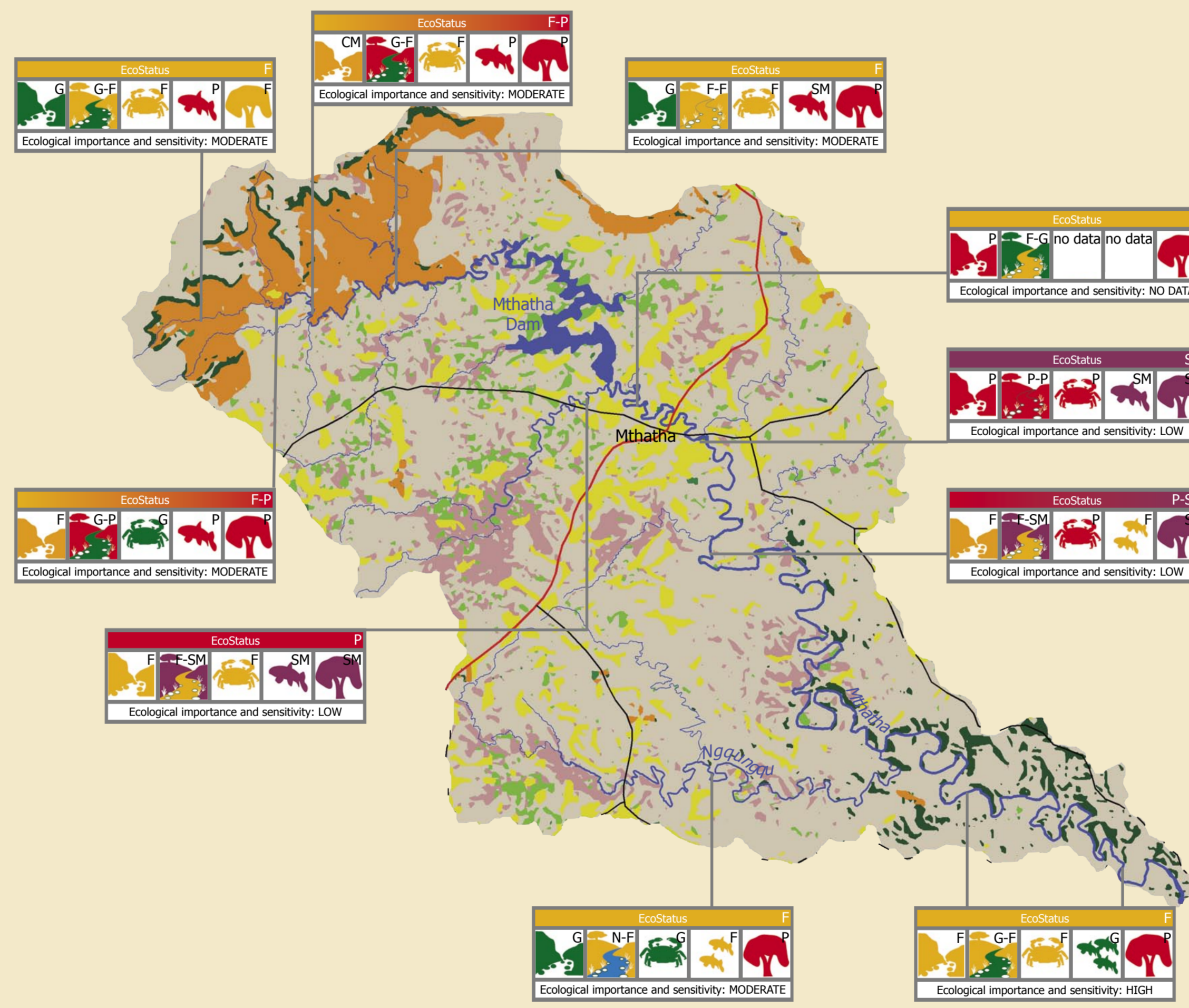
Mthatha Town is the major urban area in the catchment. Rural settlements along riverbanks are common. People in the rural areas are self-sufficient - for example, they keep livestock, have vegetable gardens and make their own bricks - and therefore have a direct dependency on the natural resources. Although the area is heavily populated, it has a low level of economic development. The exception is Mthatha town where the government, commerce and

educational institutions provide employment. Mthatha airport is situated to the north west of Mthatha town, close to Mthatha Dam. The Walter Sisulu University, previously known as the University of Transkei, is situated in Mthatha. The Hole in the Wall, Coffee Bay and Mthatha Mouth are some of the well-known holiday resorts along the coast. Subsistence farming occurs throughout the catchment. Informal settlements naturally cluster near employment opportunities, such as the road works to Ugie, the timber mills and Mthatha town.

Households in Mthatha Town and the surrounding suburbs have access to potable drinking water and some rural villages have stand pipes. Almost 60 % of the rural communities have no access to potable drinking water and still depend on untreated river water for their basic domestic needs. A similar pattern is observed for sanitation (ablution facilities). Households in Mthatha Town and its immediate surrounding suburbs have access to running-water/flushing toilet systems or flushing toilets with septic tanks, while almost 50 % of households in the catchment have no toilet facilities. Due to population growth and poor infrastructure, the supply of potable water to all households is a problem.



Present Ecological State



Gully (donga) erosion

Gully erosion, which occurs throughout South Africa, is particularly visible in the areas of Mjika, Kambi and Ncise in the Mthatha district. A gully is a landform created when running water removes soil from the land surface. Gullies are ditches that can be metres deep and cover tens of metres in surface area.

Soils in the Mthatha area are acidic and contain dispersive clays which cause the soil to crack after wetting and drying. These cracks allow water to percolate through the profile and remove material which causes vertical cracks to widen which ultimately leads to collapse and gully extension. With time, the angle of the gully sidewalls flattens out and vegetation becomes established, which stabilises the gully and stops further widening.

Gully size is determined by the availability of readily erodible material and with time, gully length tends to remain constant whereas the number of gullies within an area will increase. There is strong evidence that the number of gullies in an area is closely related to periods when droughts are followed by intense flooding. For example, gully extension occurred in some parts of the Eastern Cape and Kwa-Zulu Natal after a major drought in the 1960s, followed by heavy rainfalls and intense flooding in the 1970s.

Gully extension can be stopped by building dam walls or gabion-type structures, which trap sediments within the gully system upstream of the structure. However, this technique is not successful where the soils are erodible or soil piping occurs.

Impacts on the Mthatha River



Sources of river contamination

Effluent discharges of unacceptable quality, untreated or inadequately treated sewage from sewage treatment works, runoff from informal settlements with insufficient water services and sanitation, and leachate from illegal solid waste disposal sites cause in-stream water quality to deteriorate. The Mthatha Sewage Treatment Works is unable to treat the town's large amount of raw sewage. Other sewage pump stations cannot cope and some have been completely decommissioned which leads to raw sewage being pumped into the river.

Habitat destruction

Uncontrolled land use practices, such as agricultural activities and livestock grazing in the riparian zone, destroy riparian vegetation and result in river bank destabilisation. This in turn encourages alien infestation which ultimately results in increased erosion and in-stream sediment deposits and eventual in-stream habitat loss. Impacts of sand mining include the destruction of in-stream and riparian habitat, in-stream silt deposits and increased turbidity. Another impact is the removal of trees for firewood.

Alien species

Forestry and other alien vegetation encroaching on the riparian zone destabilise river banks causing increased erosion and deposition of sediments that subsequently destroy in-stream habitat. Predatory alien fish species have had a severe impact on the presence and distribution of indigenous fish species. Alien vegetation species such as water hyacinth reduce river flow.

Implementation of the Reserve

Regulated releases from Mthatha Dam, as well as the erratic releases from First Falls Dam for hydro-electricity generation, have modified the flow regime and severely altered the in-stream habitat.

Recommended management actions

Local and regional authorities, in consultation with DWAF, need to monitor and upgrade sewage treatment works, locate sources of contamination and take action against those who discharge effluent of unacceptable quality. DWAF and local authorities must monitor and manage runoff from towns and informal settlements and provide proper water services and sanitation. Local authorities need to publish and enforce the laws governing proper waste disposal, locate sources of contamination and take action against those who are responsible for illegal dumping of waste. Failure to deal with the problem of river contamination leads to chronic illness and the outbreak of cholera.

Local authorities and agricultural extension officers need to encourage subsistence farmers to improve current land use practices to ensure their future livelihoods, and together develop a grazing management system and soil conservation measures to reduce soil erosion. Where possible, farmers must not allow livestock to graze in the riparian zone. Local authorities, regional authorities and DEAT must monitor and regulate sand mining activities and ensure that communities are involved in decision-making regarding the use of natural resources.

Local authorities and landowners must ensure that alien plantations do not encroach on the riparian zone and must arrange for the removal of invasive alien vegetation where necessary. The relevant authorities and organisations need to stop the spread of alien species by communication and law enforcement.

DWAF will determine the ecological Reserve and give effect to it.

