



WWF

TOGETHER
INVESTING IN THE
FUTURE OF SOUTH
AFRICA'S MARINE
AND FRESHWATER
ECOSYSTEMS



REPORT

ZA

2013



An introduction to
**SOUTH AFRICA'S
WATER SOURCE AREAS** 

The 8% land area that provides 50% of our surface water

WATER DOESN'T COME FROM A TAP, NOT EVEN A DAM

If we as South Africans wish to meet our common aspirations of social and economic development, we will need to act decisively to prioritise the management of our water resources and the ecosystems that provide us with water.

In terms of the supply of water, we will need to embrace the fundamental concept that water does not come from a tap, not even a dam; water is provided to us by healthy and functioning ecosystems.



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Further technical details on South Africa's Water Source Areas can be found in the accompanying report *Defining South Africa's Water Source Areas*, 2013; WWF-SA.

www.wwf.org.za/media_room/publications

For more information on South Africa's Water Source Areas please visit www.journeyofwater.co.za

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FOREWORD



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Nelson Mandela’s words calling for a just and sustainable South Africa are etched on our national consciousness: “Let there be justice for all. Let there be peace for all. Let there be work, bread, water and salt for all.” Achieving that balance of work, bread and water for all in our process of development remains a core challenge for government, business and citizens alike. Water is an absolute necessity to meet our most basic human needs as well as to grow our economy. South Africa is a water-scarce country, and our development has always been constrained by our ability to overcome the difficulties of ensuring that water supplies are available where and when we need them.

Our history shows us heroic episodes of redesigning nature: building dams and constructing ambitious schemes to transfer water to our major urban centres and to Gauteng – located on a water divide between the mighty Orange and Limpopo river basins, high and dry on the Highveld. This engineered infrastructure, built over the last century, brought water to drier areas, enabling agricultural and industrial development. The last decade has seen a focus on supplying more South African households with safe, reliable drinking water and bringing taps to homes and settlements that were previously marginalised. But on this mission to dam and deliver water, we have lost sight of where our water comes from and the critical role of nature in ensuring water for all. Although critical in the water supply chain, engineered infrastructure cannot deliver if we do not take care of the ecological infrastructure - the catchments, rivers and aquifers - that feed our dams and water schemes.

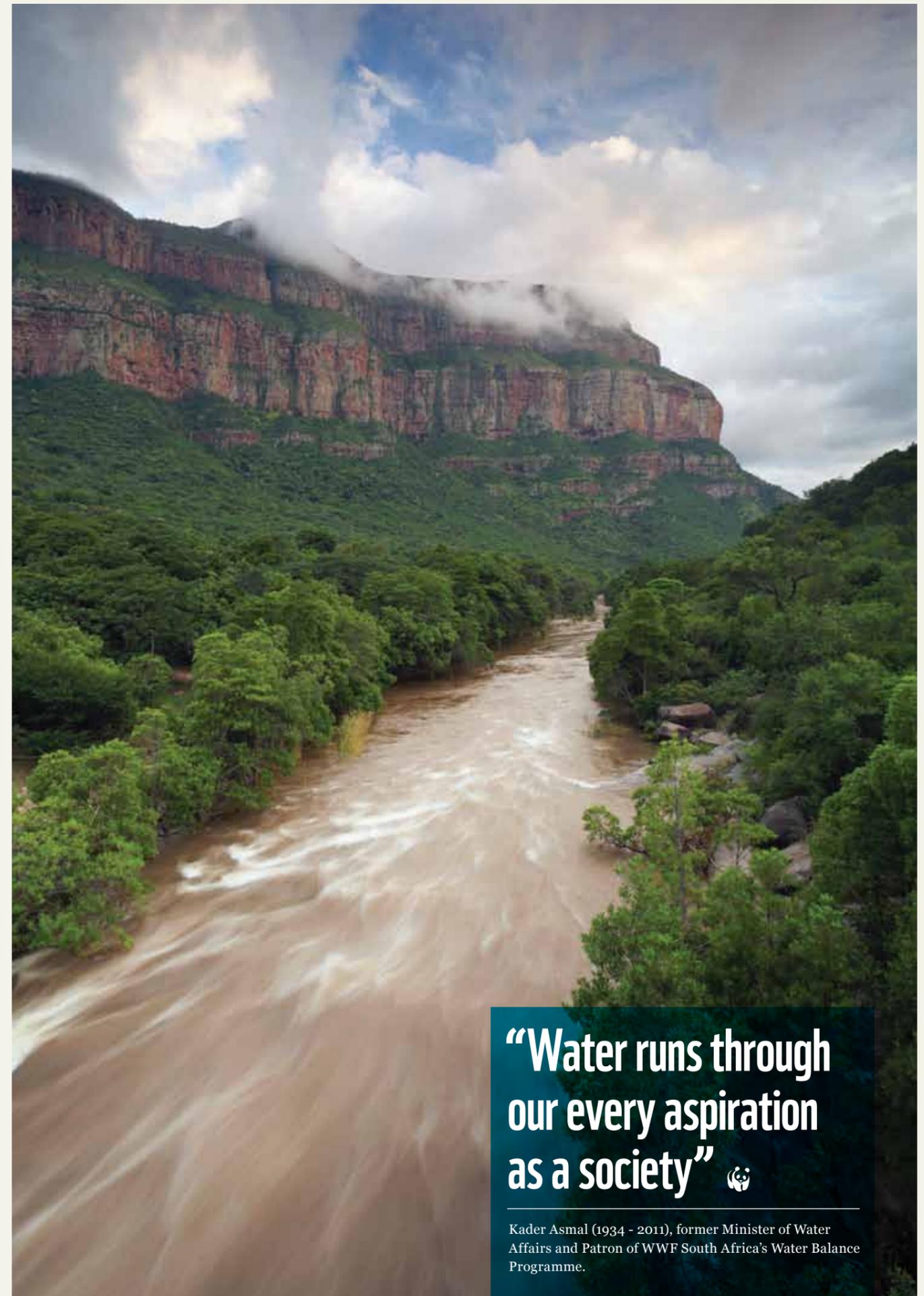
Recent research by WWF South Africa and the Council for Scientific and Industrial Research (CSIR), with funding from Sanlam, mapped out South Africa’s strategic water sources areas - the ‘crown jewels’ of the country’s water resources. This research found that only 8% of the land area of South Africa generates more than half of our river flow. These findings and this report further remind us that our water doesn’t come from a tap (or from a dam for that matter).

To achieve the balance between ‘work, bread and water...for all’ our water source areas need special attention. We need to plan strategically for development in these areas to protect their ability to deliver water to the rest of the country. This episode of our development requires heroic and far-sighted acts to protect these precious natural assets and ensure that future generations of South Africa inherit a healthy landscape that can provide them with water security.

WWF’s vision is to inspire people to live in harmony with nature. We need to plan and build our future economic growth in harmony with our water source areas. We hope that through this work, South Africans will develop a better understanding and appreciation of our country’s water challenges, and our different roles in ensuring a water-secure future for our country.



Morné du Plessis
Chief Executive Officer: WWF South Africa



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“Water runs through our every aspiration as a society” 

Kader Asmal (1934 - 2011), former Minister of Water Affairs and Patron of WWF South Africa’s Water Balance Programme.

INTRODUCTION

The availability of freshwater is one of the major limiting factors to South Africa's development. We are a water-scarce country with rainfall

distributed unevenly in our landscape, inconveniently away from the centers of mining and industry, and tied to seasonal cycles that drive us repeatedly from feast to famine, between floods and droughts.

Our ingenuity as a nation has focused on overcoming these limitations – bringing water to where we need it, storing it for when we need it, and enabling us to build our economy. The 1930s and then the 1970s and 80s saw a massive investment in dams and inter-basin transfer schemes to meet the needs of our growing economy.

A massive and expensive network of engineered infrastructure supplies the drier parts of the country. Gauteng, North West province and Limpopo, and major urban centers such as Durban, Port Elizabeth and Cape Town are supplied via dams, transfers and pumping schemes.

The cost to upgrade and maintain this engineered infrastructure is estimated at R680 billion over the next decade.

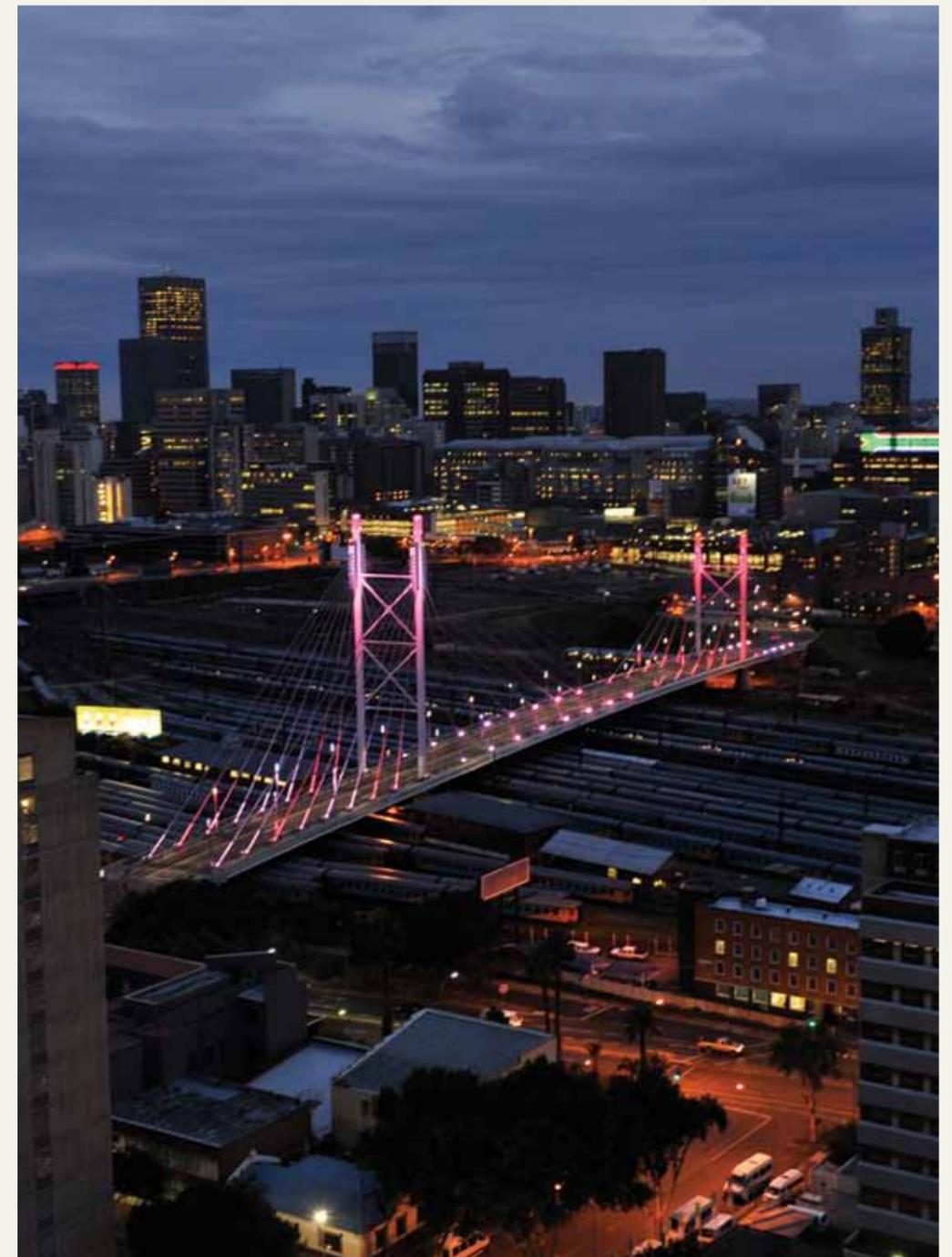
However, water doesn't just come from a dam, a pipe or a tap. Our modern water cycle is comprised of both engineered infrastructure and ecological infrastructure. The built (engineered) part of our water system is dependent on the healthy functioning of the natural (ecological) part of the system.

The last century has seen a focus on the engineered system, the part that we can design and control. Our water security in this century will depend on our ability to plan our development in a way that is compatible with ecological infrastructure and limits the impacts that diminish nature's ability to provide us with water.

We need to acknowledge the limitations of our natural water resources and prioritise their use and protection if we are to grow a sustainable economy that meets the needs and aspirations of all South Africans.



21% of South Africa receives less than 200 mm rain a year



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The Witwatersrand gold deposits are located on a water divide (or watershed) between the Limpopo and the Orange basins. "Witwatersrand" means 'ridge of white water' and this water divide originally had local sources of springs cascading from the high ridges. However, settlement and mining in this area required the water to be pumped for use and mine-shafts to be dewatered and local sources soon outstripped the supplies from local streams and springs. Gauteng, our 'place of gold', would have been high and dry without our nationally interconnected systems of dams and inter-basin transfer schemes. The province, South Africa's economic hub, is dependent on water transferred up-stream in the Orange-Vaal system and transferred into the basin from other river basins such as the Thukela.

SOUTH AFRICA'S FRESHWATER RESOURCES AND ECOSYSTEMS

South Africa is famous for its biodiversity, and is the third most biodiverse country in the world. In terms of freshwater biodiversity, we have 223 different types of river ecosystems and 792 different types of wetlands ecosystems.

These represent a huge diversity in physical conditions – from the seasonally flooded pans of the southern Kalahari to the perennial wetlands of the Natal Coastal Plain, and the short isolated catchments of the southern coastal belt to the vast drainage basins of the Orange and Limpopo rivers. Two-thirds of our water resources are shared with six of our neighbouring countries.

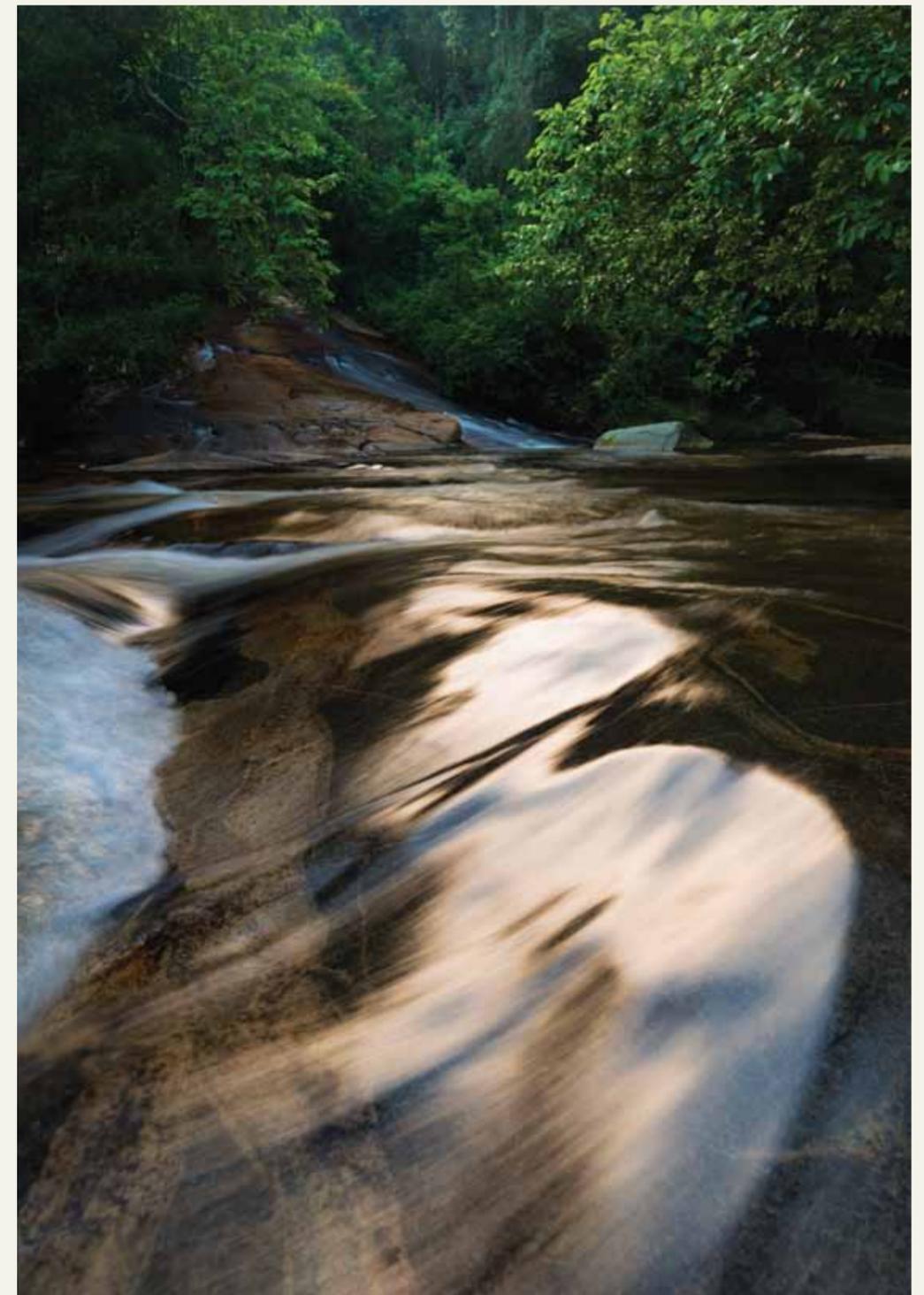
Rivers, wetlands and aquifers form a fascinating and essential part of our natural heritage. South Africa's freshwater ecosystems have been mapped and classified into National Freshwater Ecosystem Priority Areas (NFEPA's). This work shows that 60% of our river ecosystems are threatened and 23% are critically endangered. The situation for wetlands is even worse: 65% of our wetland types are threatened, and 48% are critically endangered.

The health of our rivers and wetlands is measured by the diversity and health of the species we share these resources with. The 'water resource' is a living resource, complete with microbes, plants and animals that interact with, and control, the water and chemical cycles that determine how we can use the resource. Clean and healthy water resources are provided by healthy landscapes. Rivers are seen as the arteries of our living landscapes, and this is particularly true in semi-arid countries such as South Africa.

Water faces many threats on its journey from the headwaters of the river basin to water users and estuaries. Pollution from fertilisers, waste water treatment plants and mining threatens to poison our rivers. Over-abstraction from streams and boreholes and excessive losses from leaking pipes threaten to dry up our resources. Water is a renewable resource, replenished each year during the rainy season. However, it is an irreplaceable resource. We cannot substitute water with anything else. Whilst coal as an energy source can be substituted by solar energy or biofuels, water cannot be replaced.

As a water-scarce country, South Africa must act urgently to protect water resources and ensure we use what we have in the most efficient and effective ways possible. We need to recognise where water comes from, how to protect it along its journey to us and how to stop wasting it. This will need management and investment in the critical ecological and engineered parts of our water cycle. The first step in our water cycle is the point at which rainfall becomes river flow – that is, in our water source areas.

**AS A WATER-SCARCE
COUNTRY, SOUTH AFRICA
MUST ACT URGENTLY
TO PROTECT WATER
RESOURCES AND ENSURE
WE USE WHAT WE HAVE IN
THE MOST EFFICIENT AND
EFFECTIVE WAYS POSSIBLE.**

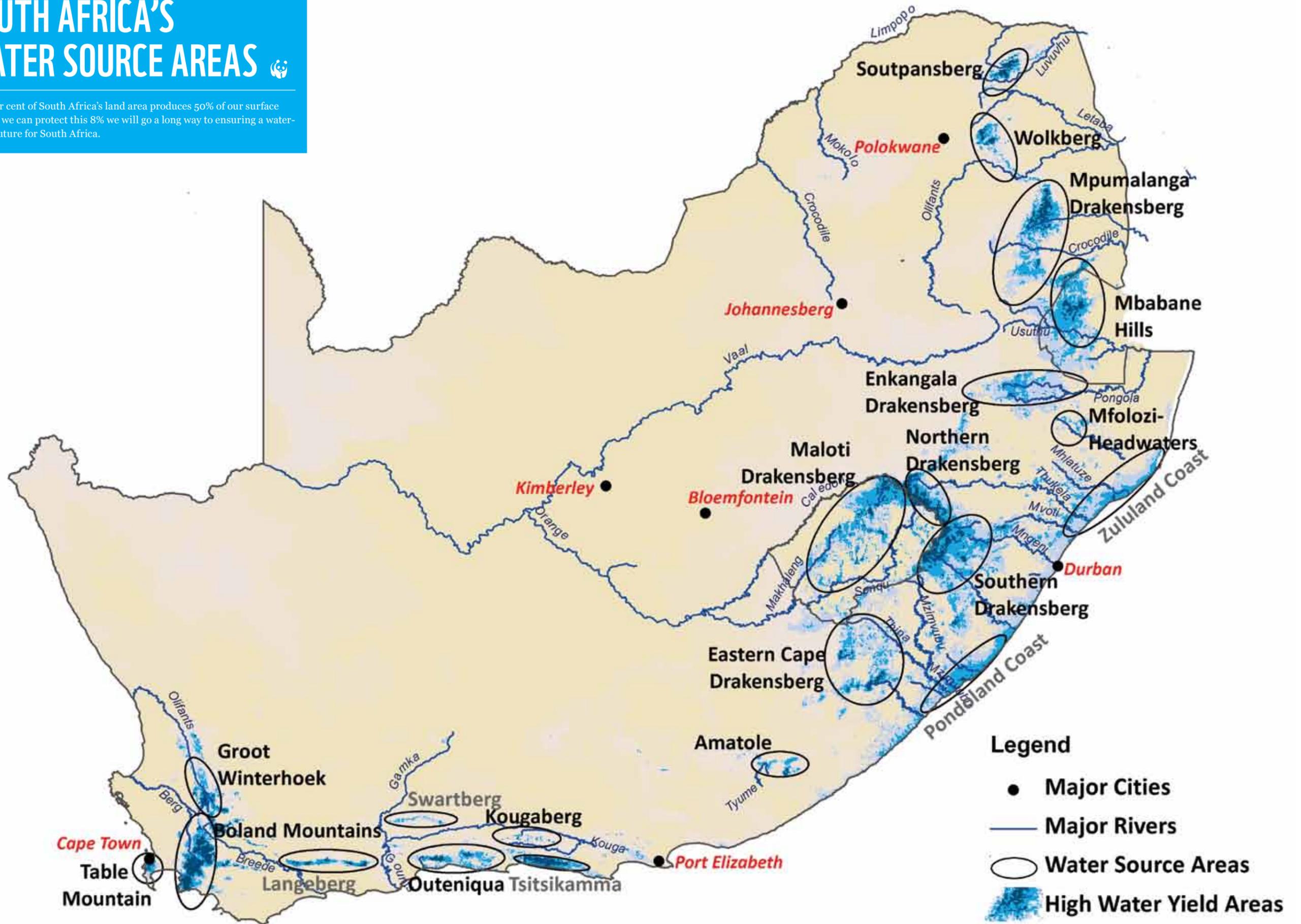


© HOUARD MALAN

Seeing water purely as an infrastructure issue seems to completely miss the systemic nature of water risks and the need to plan for water security in a highly integrated manner. The systemic nature of water risks is the very reason why the World Economic Forum ranked a "water supply crisis" as the most important societal global risk in its Global Risks 2013 report.

SOUTH AFRICA'S WATER SOURCE AREAS

Eight per cent of South Africa's land area produces 50% of our surface water. If we can protect this 8% we will go a long way to ensuring a water-secure future for South Africa.



SOUTH AFRICA'S WATER SOURCE AREAS

Rainfall in South Africa is very uneven and seasonal. This means that some parts of South Africa's landscape are more critical in providing us with water. Our water law accepts

that some areas need more protection than others. So if we want to protect the vital organs of our living water landscape, where should we focus our efforts?

WWF South Africa conducted research with the Council for Scientific and Industrial Research (CSIR) to assess where most of our water comes from. By modeling information about rainfall and river run-off, the research revealed that only 8% of our land area produces 50% of our surface run-off. We wanted to know where these areas occur, what are the threats to water security in these areas and how can we protect them for future generations.

Water source areas (WSAs) provide a disproportionate amount of run-off to the rest of the catchment. South Africa's water source areas are generally found in the highest parts of the landscape that receive the most rainfall. Downstream users and ecosystems are dependent on the healthy functioning of these areas to sustain good quality water supplies.

South Africa's WSAs can be grouped into 21 areas, listed in table 1. The dominant land cover is natural vegetation cover (63%), often because slope and altitude have prevented more intense development. Fifteen per cent of the area is cultivated and 13% is under plantation. Three per cent is degraded land, mainly in the Eastern Cape. Less than 1% of water source areas are currently mined; however, 70% of the areas in Mpumalanga are under either a prospecting or mining license and this is cause for particular concern. The overlap of coal deposits and water source areas is also less than 1% of all WSAs, but it is significant in the Enkangala Drakensberg and the Mfolozi headwaters.

Only 16% of the WSAs are formally protected as nature reserves or parks. The highest protection is found in the Western Cape with the Kougaberg, Swartberg and Grootwinterhoek areas having more than 70% formal protection. Water source areas in the Eastern Cape and Maloti Drakensberg, the Enkangala Drakensberg, the Mfolozi headwaters and the Soutpansberg have very low or no protection.

South Africa's WSAs can be further divided into those of local importance and those of national importance. Five WSAs are of local importance, but have limited downstream dependents and impact. These are mainly on the coast in the Western Cape and KZN.

The 16 nationally important WSAs form the headwaters of major river systems which supply significant downstream areas and/or the economy, including inter-basin transfers. These are South Africa's strategic WSAs. Disrupting water supply from these 16 strategic WSAs would effectively turn off the taps to our economy and seriously impact our food and water security.

Table 1: Summary Table Of South Africa's Water Source Areas.

Water Source Area	Main Rivers	Threats
Grootwinterhoek*	Olifants River; Klein Berg; Doring	land degradation; climate change; alien invasive vegetation; fires
Table Mountain*	Hout; Diep	climate change; alien invasive vegetation; fires
Boland Mountains*	Berg; Breede; Riviersonderend	large-scale plantations; land degradation; climate change; alien invasive vegetation; fires
Langeberg	Doring; Duiwenhoks; Naroo; Gouritz; Breede.	climate change; alien invasive vegetation; fires
Swartberg	Gamka; Sand; Dorps; Gouritz; Olifants	climate change; alien invasive vegetation; fires
Outeniqua*	Groot Brak; Olifants	large-scale plantations; alien invasive vegetation; fires
Kougaberg*	Kouga; Baviaanskloof; Olifants; Gamtoos; Gouritz	climate change; alien invasive vegetation; fires
Tsitsikamma	Groot Storms; Klip; Tsitsikamma	large-scale plantations; land degradation; alien invasive vegetation
Amatole*	Great Kei, Keiskamma, Great Fish, Tyume; Amatele.	land degradation; fires; alien invasive vegetation
Eastern Cape Drakensberg*	Mzimvubu; Orange; Bokspruit; Thina; Klein Mooi; Mthatha	land degradation; fires; climate change
Pondoland Coast	Mzimvubu, Mngazi, Mntafufu; Msikaba	large-scale cultivation and plantations; coal mining; land degradation
Maloti Drakensberg*	Caledon; Orange; Senqu	large-scale cultivation; land degradation
Northern Drakensberg*	Senqu; Caledon; Thukela; Orange; Vaal	coal mining; land degradation
Southern Drakensberg*	uMngeni; Mooi; Thugela; Mkomasi; uMzimkulu	large-scale plantations; land degradation
Mfolozi Headwaters*	Lenjane, Black Mfolozi; Pongola	large-scale plantations and cultivation; coal mining land degradation
Zululand Coast	Mvoti; Thukela; Mhlatuze	large-scale cultivation; coal mining; land degradation
Enkangala Drakensberg*	Pongola; Bivane; Assegai; Vaal; Thukela; Wilge	coal mining; large-scale plantations; land degradation
Mbabane Hills*	Usutu; Lusushwana; Mpuluzi; Inkomati, Pongola	large-scale plantations; land degradation
Mpumalanga Drakensberg*	Elands; Sabie; Crocodile; Olifants	large-scale plantations; coal mining; land degradation
Wolkberg*	Middle Letaba; Ngwabitsi; Oliphants	large-scale plantations; land degradation; climate change
Soutpansberg*	Luvuvhu; Little Letaba; Mutale; Mutamba; Nzhelele	large-scale plantations and cultivation; land degradation

Water source areas marked with * have been identified as the country's strategic water source areas.



South Africa's water source areas are generally found in the highest parts of the landscape that receive the most rainfall. Downstream users and ecosystems are dependent on the healthy functioning of these areas to sustain good quality water supplies.

THREATS TO OUR WATER SOURCE AREAS

1/3
1/3 OF OUR DAMS ARE OVERLOADED WITH NUTRIENTS (E.G PHOSPHATE), MAKING THEM EUTROPHIC. A FURTHER 1/3 ARE BORDERLINE EUTROPHIC.

Threat

Coal mining causes acid mine drainage (AMD) as water reacts with sulphides in the ore rock, making sulphuric acid. Acid dissolves toxic metals more easily than neutral water, and these metals cause health problems for people, livestock and fish in the rivers. Crops irrigated with the water also suffer.

Alien plants such as black wattle and pines invade landscapes, outcompeting natural plants. They reduce the natural biodiversity, destroy ecosystems and use more water than indigenous plants. An estimated 7% of South Africa's available water resources are lost to alien plants.

Fires are a part of the natural life cycle of Fynbos, savannah and grasslands. But today we are seeing a very high frequency of fires, and that doesn't allow enough time for natural ecosystems to recover. Higher intensity and frequency of fires means that soil is eroded more easily and ends washed away from the landscape that needs it, and clogging up rivers and dams.

Climate change is predicted to hit South Africa harder than countries in the north and will be felt first through water impacts. Higher temperatures will mean that plants need more water, evaporation rates increase and algal blooms are more likely to destroy dams. More droughts are predicted for the Northern and Western Cape. In Gauteng and KZN rainfall events will be more intense resulting in more flood damage and erosion.

Land degradation happens when land is over-used and poorly managed. Nutrients and soil are lost from poorly managed crop agriculture and contaminate rivers and wetlands. When the number of livestock exceeds the carrying capacity of the land, riparian areas are trampled and biodiversity is lost. Degraded land cannot recover easily from inevitable droughts and floods.

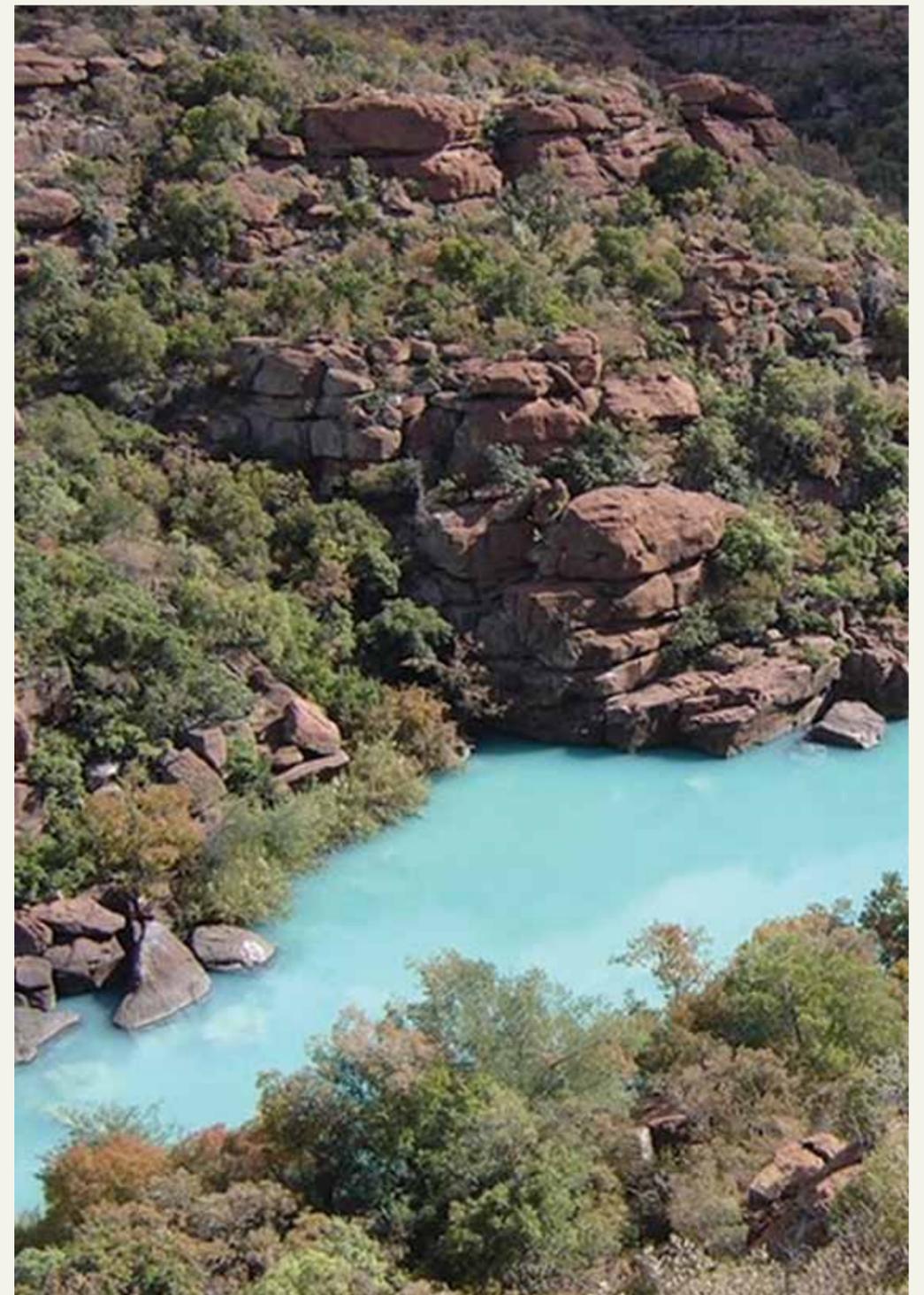
Plantations of pine and wattle use much more water than natural vegetation cover and reduce stream flows. Some forestry companies maintain buffer zones around rivers and wetlands and allow space for natural vegetation to flourish. However, where plantations are poorly managed they reduce available water to other users and are a source of invasive plants.

Large-scale cultivation of mono-crops such as sugar can reduce the amount of water available in rivers, wetlands and aquifers. These crops use more water than the natural vegetation and so stream flow can be reduced. Sustainable farming of these crops needs to accommodate buffer zones around rivers and wetlands.

Water source areas can be protected by:

- Strategic planning to prioritise water and prevent incompatible land-uses;
- Including them in nature reserves or conservancies;
- Implementing water stewardship, restoration and land-care initiatives in these areas.

Water source areas can be used productively in agriculture and well managed plantations where special care is taken to avoid soil erosion, pollution and disruption of the water cycle. Restoration is required in some areas, such as the Maloti-Drakensberg in the Eastern Cape, where land has been degraded. Restoration and compatible land-uses can stimulate the rural economy in water source areas and provide jobs.



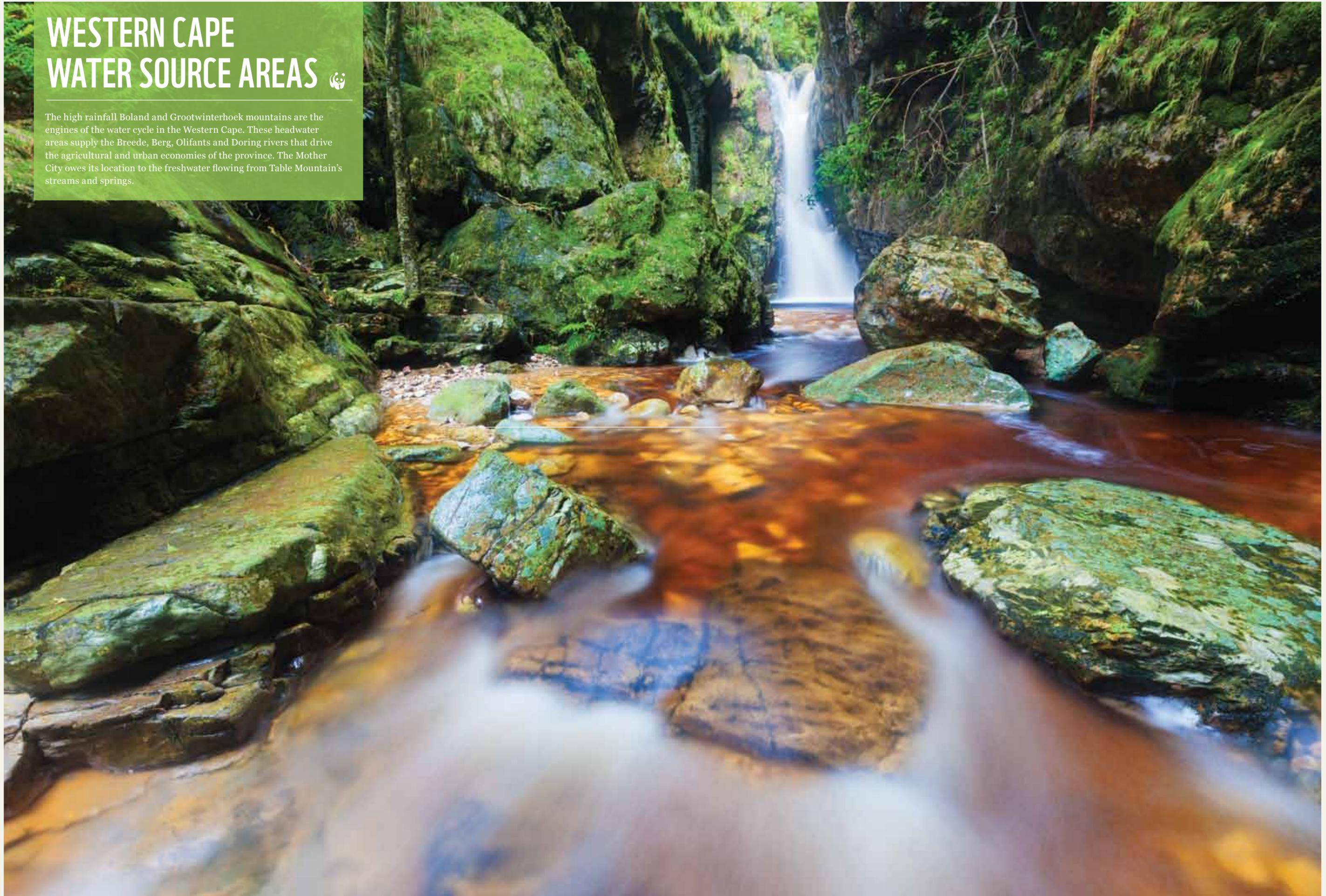
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The consequences of abandoned mines and resultant acid mine drainage (AMD) in the gold mining areas of the Witwatersrand basin as well as the coal mining areas of the Olifants catchment are well known. At a national level, policies and strategies to clean up some of the pollution from gold mining have been established. However, on the ground, prospecting rights for coal mining are being issued in some of our most precious and sensitive catchments.

WESTERN CAPE WATER SOURCE AREAS



The high rainfall Boland and Grootwinterhoek mountains are the engines of the water cycle in the Western Cape. These headwater areas supply the Breede, Berg, Olifants and Doring rivers that drive the agricultural and urban economies of the province. The Mother City owes its location to the freshwater flowing from Table Mountain's streams and springs.





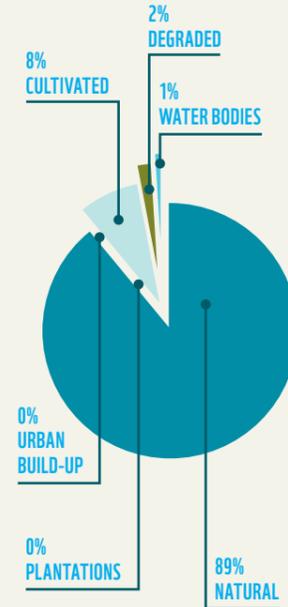
GROOTWINTERHOEK

Did you know?

- The Grootwinterhoek and Cederberg mountains are a critical water source area and a biodiversity hotspot, and 70% of this area is protected.
- The free-flowing Doring River flows from here. It is the longest (200km) free-flowing river in the Western Cape.
- Some of the country's greatest San rock art is found here, as is the beautiful Cape mountain leopard. The rivers here are home to a variety of freshwater fish in South Africa.

Province: Western Cape
Level of protection: 72%
Main rivers: Olifants; Klein Berg; Doring
Free-flowing rivers: Doring
Interbasin Transfer Systems: Olifants to Breede
Dams: Misverstand; Clanwilliam; Voelvlei; Bulshoek.
Supplies water to: City of Cape Town; Atlantis; Ceres; Saldanha
Ramsar Site(s): Langebaan and Verlorenvlei downstream
Protected areas: Grootwinterhoek Wilderness Area; Cederberg Wilderness Area
Threats: land degradation; climate change; alien invasive vegetation; fires

LAND USE (%)



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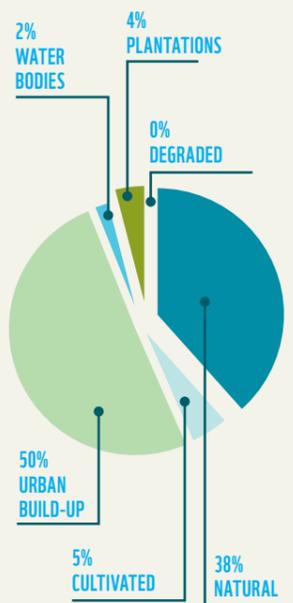
TABLE MOUNTAIN

Did you know?

- The availability of clean drinking water from Table Mountain is the reason Cape Town was established as a port city and trade route centuries ago. The river in Platteklip gorge and springs in Oranjezicht were the first sources used.
- Camissa is the Khoi name for Cape Town, which means 'place of sweet waters'.
- There are currently seven dams in and around Cape Town supplying the water to the metro; however, these are not enough. Additional water is sourced from the Berg, Theewaters, Voelvlei and Steenbras dams located outside the city and supplied by Boland Mountain water source area.

Province: Western Cape
Level of protection: 39%
Main rivers: Hout; Diep
Free-flowing rivers: None
Interbasin Transfer Systems: None
Dams: Silvermine, Kleinplaas dam, Victoria, Hely-Hutchinson, Woodhead
Supplies water to: City of Cape Town
Ramsar Site(s): None
Protected areas: Table Mountain National Park
Threats: climate change; alien invasive vegetation; fires

LAND USE (%)





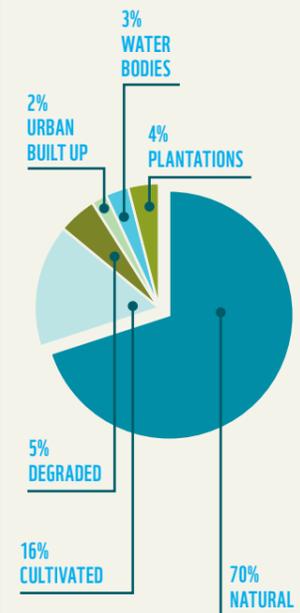
BOLAND MOUNTAINS

Did you know?

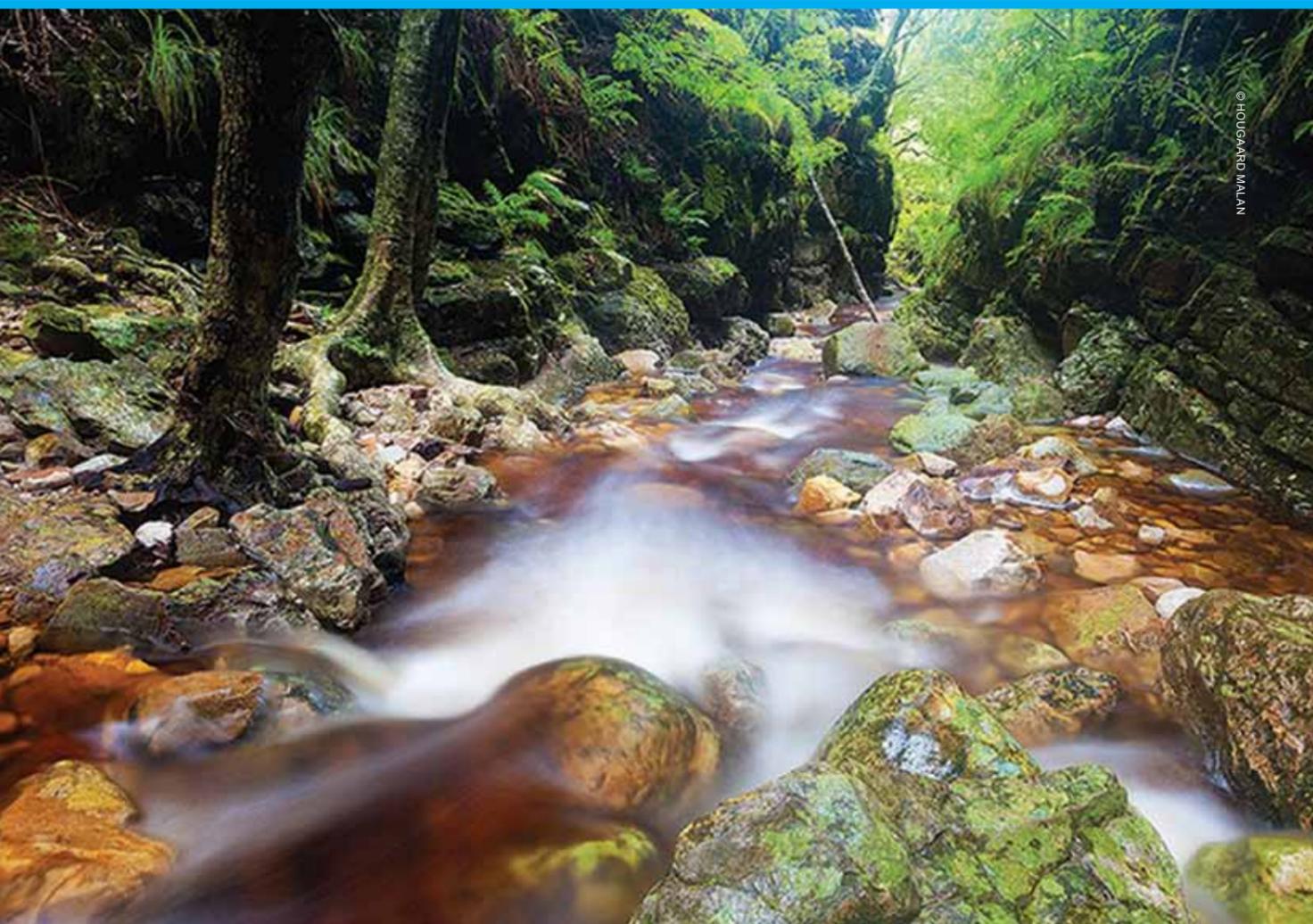
- The Breede River is the largest river in the Western Cape and is a key resource for many economic activities in the region.
- The Boland Mountains are the main water source area for the City of Cape Town and surrounds.
- This area is also South Africa's frog hotspot with the most frog species, including mossy, marsh and the micro frog, which is only 1cm long.

Province: Western Cape
Level of protection: 58%
Main rivers: Berg; Breede; Riviersonderend
Free-flowing rivers: Rooiels
Interbasin Transfer Systems: Riviersonderend to Berg Basin; Olifants to Breede
Dams: Bot River Vlei; Elandskloof; Wemmershoek; Stettynskloof; Kogelberg; Fortuin; Jonkershoek; Berg River Dam; Theewaterskloof; Steenbras; Voelvlei.
Supplies water to: City of Cape Town; Winelands Municipality; Stellenbosch; Worcester; Robertson; Swellendam; Overberg Municipality.
Ramsar Site(s): None
Protected areas: Jonkershoek Nature Reserve, Hottentots Holland Nature Reserve
Threats: large-scale plantations; land degradation; climate change, alien invasive vegetation; fires

LAND USE (%)



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“South Africa is facing significant water challenges in the form of the effects of climate change as well as the degradation of water quality in some parts of the country. Climate change models show that the Western Cape will experience lower rainfall in many areas, with a reduction in river runoff.”



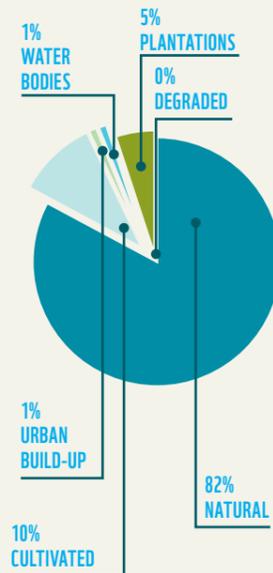
LANGBERG MOUNTAINS

Did you know?

- The mountains of the Langeberg form part of the Cape Fold belt which was as high as the Andes 250 million years ago.
- The mountains now are less than 2000m high, and water inside these mountains flows down to several thousands of metres where it heats up and then returns as hot springs – found at Calitzdorp, Montagu and Warmwaterberg.
- These mountains were also home to the Khoi and San, evident from the rock art that has been left behind.

Province: Western Cape
Level of protection: 61%
Main rivers: Breede; Gouritz; Doring; Duiwenhoks; Naroo
Free-flowing rivers: Doring
Interbasin Transfer Systems: Groot to Breede
Dams: Hartebeeskul; Barrydale; Poortjieskloof; Buffeljags
Supplies water to: Swellendam; Barrydale; Heidelberg
Ramsar Site(s): De Hoop Vlei downstream
Protected areas: Boosmansbos Wilderness Area; Bontebok National Park; Grootvaderbosch Nature Reserve; Threats: climate change; alien invasive vegetation; fires

LAND USE (%)



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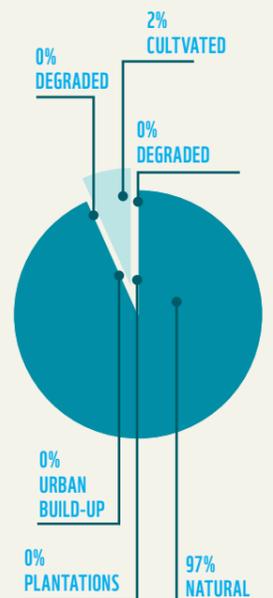
SWARTBERG MOUNTAINS

Did you know?

- The Karoo is an already arid area and it is predicted that it will get hotter and drier with climate change.
- The Klein Karoo forms part of the Succulent Karoo biome, the most diverse arid biome in the world.
- The rivers from the Swartberg drain into the Karoo and the Klein Karoo. However, most towns in the Karoo rely on groundwater as well as river water stored in dams for their water supply.
- Planned fracking activities are also a risk to this area's ground water supply.

Province: Western Cape
Level of protection: 76%
Main rivers: Gamka; Sand; Dorps; Gouritz; Olifants
Free-flowing rivers: None
Interbasin Transfer Systems: None
Dams: Gamkapoort; Callitzdorp; Oukloof; Stormdrift; Kamassie; Koos Raubenheimer
Supplies water to: Beaufort West; Oudstroom
Ramsar Site(s): None
Protected areas: Gamkapoort Nature Reserve; Gankaskloof Nature Reserve
Threats: climate change; alien invasive vegetation; fires

LAND USE (%)

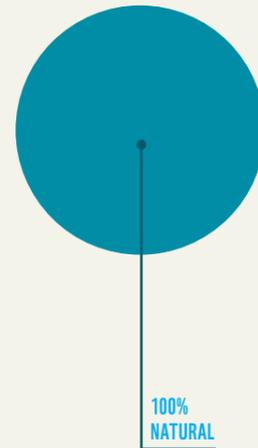




KOUGABERG MOUNTAINS

Province: Western Cape
Level of protection: 77%
Main rivers: Kouga; Baviaanskloof; Olifants; Gamtoos-Gouritz
Free-flowing rivers: None
Interbasin Transfer Systems: None
Dams: Kouga; Groendal
Supplies water to: Port Elizabeth; Uitenhage
Ramsar Site(s): None
Protected areas: Garden Route National Park; Addo Elephant Park; Baviaanskloof Nature Reserve
Threats: climate change; alien invasive vegetation; fires

LAND USE (%)



Did you know?

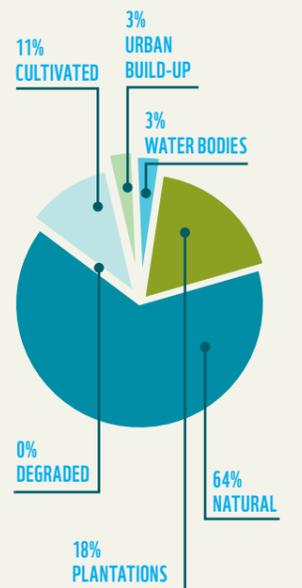
- The high mountains of the Cape Fold belt are a huge aquifer which contains groundwater from Cape Town to Port Elizabeth. It is called the Table Mountain Aquifer system because it occurs in the sandstone that takes its name from this most well-known mountain.
- Aquifers store water underground and act as nature's hidden dams: 95% of all freshwater on land occurs underground.
- This is the best protected water source area - 77% is protected in a nature reserve or conservancy.



OUTENIQUA MOUNTAINS

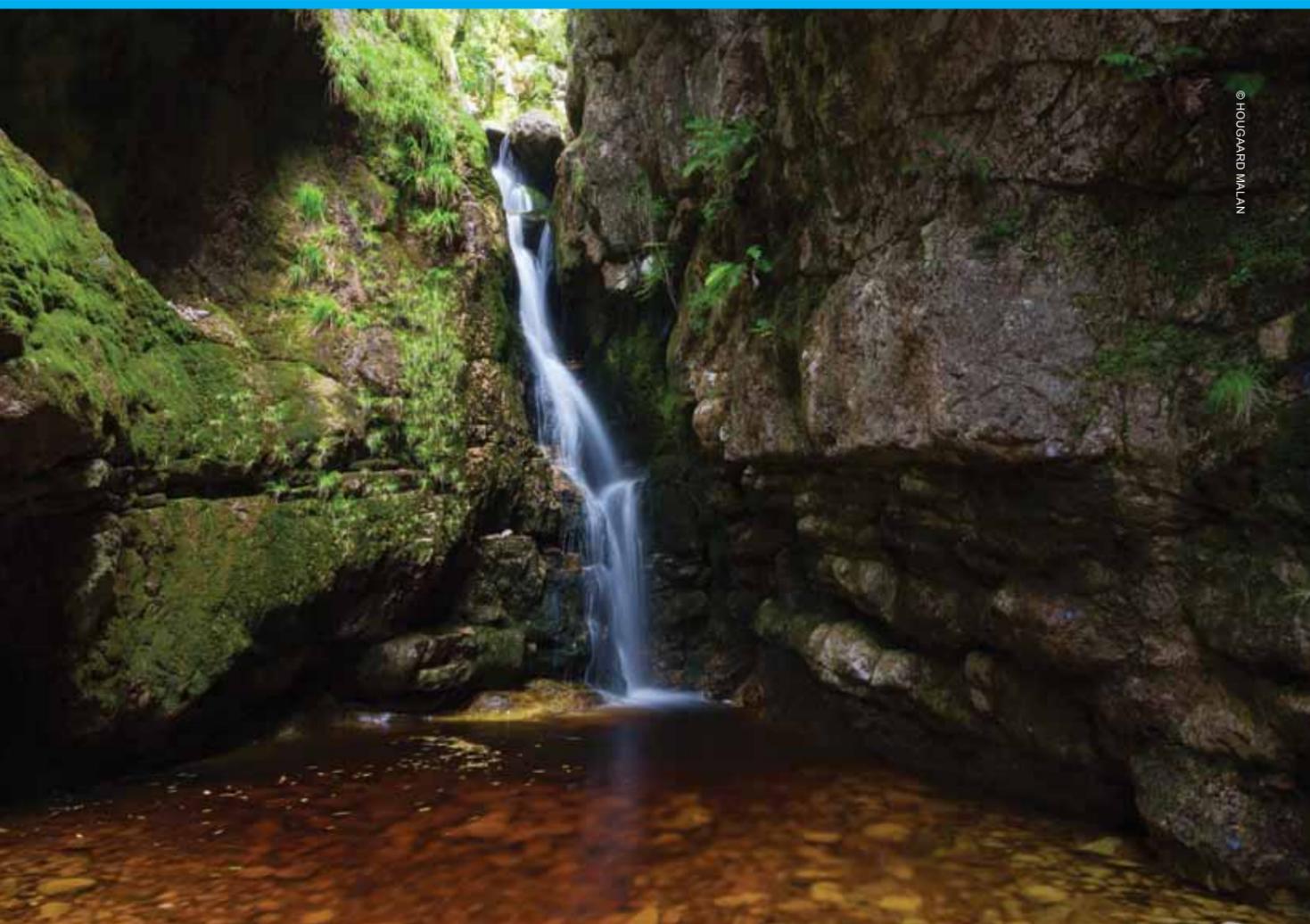
Province: Western Cape
Level of protection: 30%
Main rivers: Olifants; Groot Brak
Free-flowing rivers: None
Interbasin Transfer Systems: None
Dams: Ernest Robertson; Swart River; Garden Route; Klipheuwel; Hartebeeskuil; Kammanie; Stormdrift
Supplies water to: George; Oudtshoorn; Garden Route area
Ramsar Site(s): Wilderness Lakes
Protected areas: Garden Route National Park; Goukamma Nature Reserve; Doring River Wilderness Area
Threats: large-scale plantations; alien invasive vegetation, fires

LAND USE (%)



Did you know?

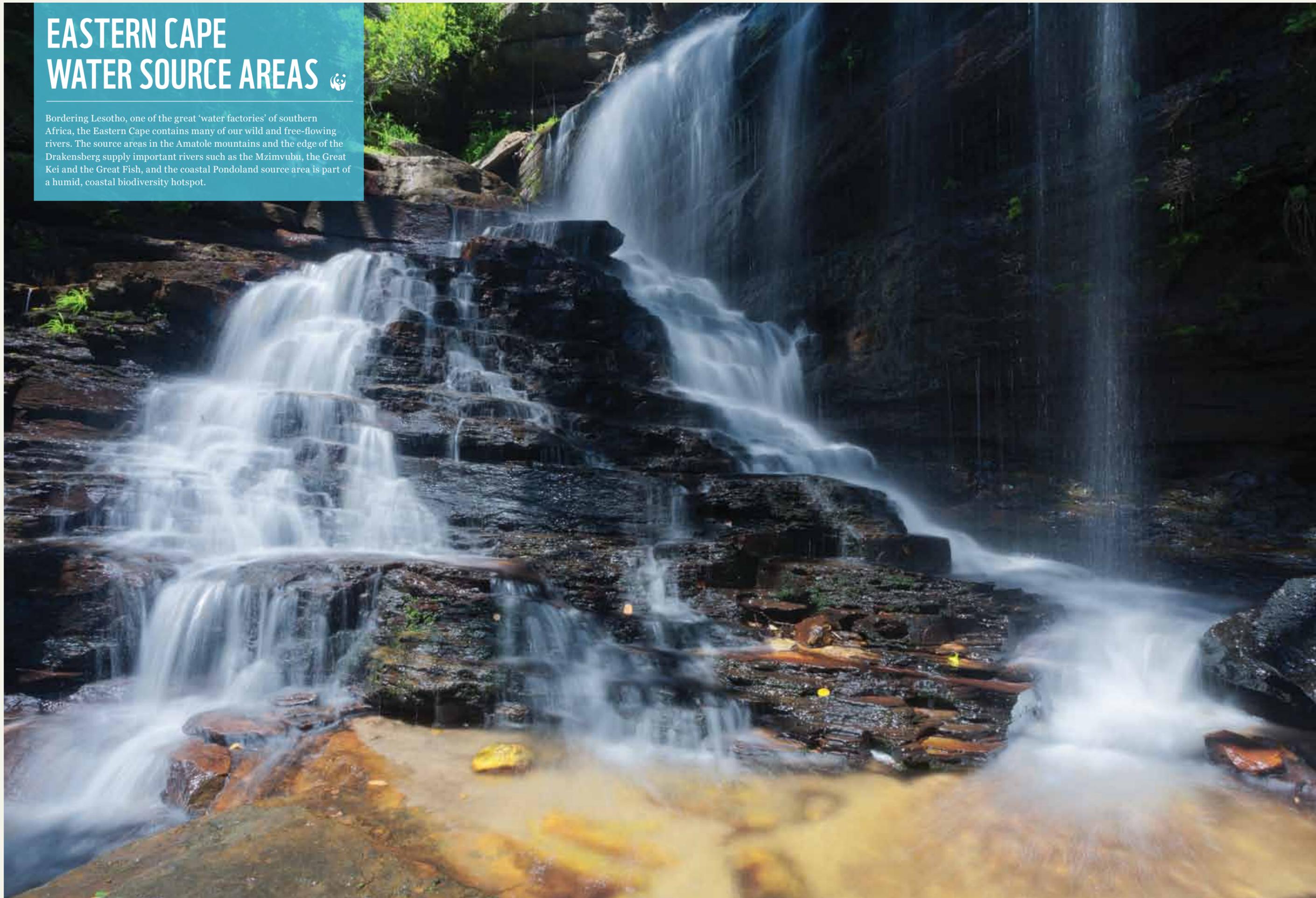
- Outeniqua means 'honey collectors' in Khoi San.
- This is the land of beer and honey - all of South Africa's hops are grown in two small catchments in this area.
- Rainfall on the top of the Outeniqua averages 900mm per annum whilst rainfall in the Klein Karoo is less than 300 mm pa. Water recharged and sourced from the mountains supports life in the arid rain-shadow of the Klein Karoo.



EASTERN CAPE WATER SOURCE AREAS



Bordering Lesotho, one of the great 'water factories' of southern Africa, the Eastern Cape contains many of our wild and free-flowing rivers. The source areas in the Amatole mountains and the edge of the Drakensberg supply important rivers such as the Mzimvubu, the Great Kei and the Great Fish, and the coastal Pondoland source area is part of a humid, coastal biodiversity hotspot.





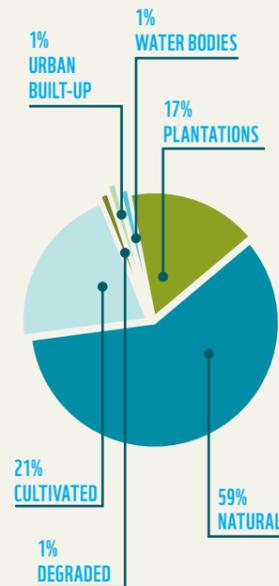
TSITSIKAMMA

Did you know?

- Tsitsikamma is a Khoi word meaning “place of abundant water”. This area is a ‘Jurassic Park’ for freshwater life.
- Half the rivers here have no natural fish species but dozens of ancient insect species which are as old as the dinosaurs, some of which are confined to a single river.
- This area is an important tourist attraction and also home to Africa’s oldest marine protected area – the Tsitsikamma MPA.

Province: Western Cape/Eastern Cape
Level of protection: 41%
Main rivers: Groot Storms, Kilp; Tsitsikamma
Free-flowing rivers: Groot Storms, Bloukrans
Interbasin Transfer Systems: Sundays to Swartkops Basin
Dams: Krom River
Supplies water to: Garden Route; Port Elizabeth; Uitenhage
Ramsar Site(s): None
Protected areas: Garden Route National Park, Formosa Provincial Nature Reserve
Threats: large-scale plantation; land degradation; alien invasive vegetation

LAND USE (%)



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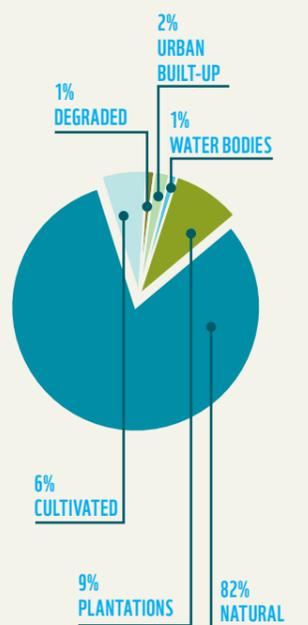
AMATOLE

Did you know?

- In the Eastern Cape only 33% of households have a tap inside the home while 22% of households use water directly from rivers, springs or boreholes.
- Water from the Great Fish is transferred into the Sundays River and used in Port Elizabeth and Grahamstown.
- This area is home to sacred forests and mountains for the Gcaleka people.

Province: Eastern Cape
Level of protection: 16%
Main rivers: Great Kei; Keiskamma; Great Fish; Tyume; Amatele
Free-flowing rivers: Riet; Kap; Mpekweni; Mgwalana
Interbasin Transfer Systems: Kubusie to Buffalo/Nahoon Basin; Fish to Sundays Basin South of Amatole
Dams: Kat River; Binfield; Wiggleswade; Rooikrants; Cata; Sandile; Gubu; Waterdown; Laing
Supplies water to: Bisho; Fort Beaufort; Grahamstown; Queenstown
Ramsar Site(s): None
Protected areas: Mpopu Nature Reserve
Threats: land degradation; fires; alien invasive vegetation

LAND USE (%)





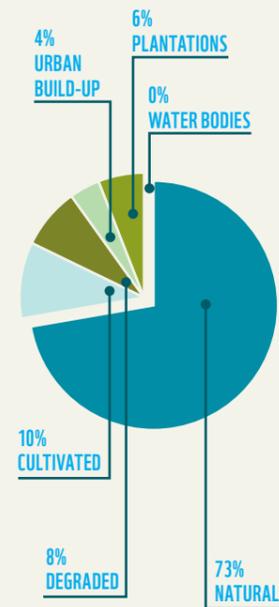
EASTERN CAPE DRAKENSBERG

Did you know?

- The Eastern Cape contains 27 of South Africa's 62 free-flowing rivers (long stretch of rivers that haven't been dammed).
- Six free-flowing rivers flow from this area, including the Kobonqaba, iNxaxo, Qhorha, Shixini, Nqabarha, Mncwasa.
- The next large dam in South Africa is being planned on the Mzimvubu at an estimated cost of R20 billion.

Province: Eastern Cape
Level of protection: 0%
Main rivers: Mzimvubu; Orange; Bokspruit; Thina; Klein Mooi; Mthatha
Free-flowing rivers: These include the Kobonqaba; iNxaxo; Qhorha; Shixini; Nqabarha; Ntlonyane; Xora; Mncwasa; Mdumbi; Kraai
Interbasin Transfer Systems: None
Dams: Mthatha; Mbeleni; Nqadu
Supplies water to: Umtata; Queenstown
Ramsar Site(s): None
Protected areas: None
Threats: land degradation; fires, climate change

LAND USE (%)



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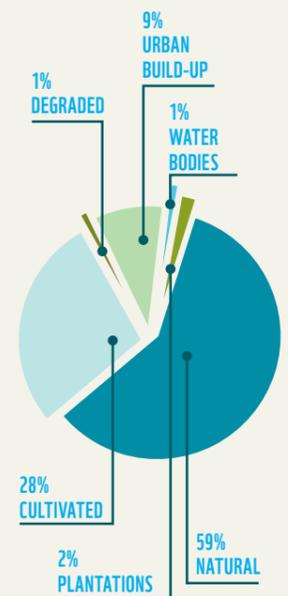
PONDOLAND COAST

Did you know?

- This area is largely rural and undeveloped. As such many people are dependent directly on the natural environment for basic services.
- The coastal area forms part of the Pondoland Marine Protected Area, with almost pristine estuaries which form nurseries to young fish.
- Despite being an area of ecological importance, the potential mining of heavy metal deposits threaten the area.

Province: Eastern Cape
Level of protection: 2%
Main rivers: Mzimvubu, Mngazi, Mntafufu; Msikaba
Free-flowing rivers: Mtakatye; Mnenu; Sinangwana; Mngazana; Mntafufu; Mzintlava; Mkozi; Msikaba; Mtentu; Sikombe; Mpahlane; Mzamba
Interbasin Transfer Systems: None
Dams: Magwa
Supplies water to: OR Tambo Municipality
Ramsar Site(s): None
Protected areas: Mkambati Nature Reserve; Pondoland Marine Protected Area
Threats: coal mining, land degradation, wildfires

LAND USE (%)





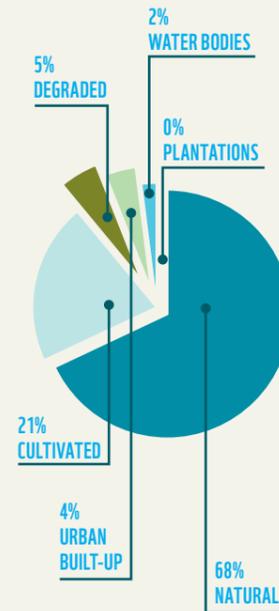
MALOTI DRAKENSBERG

Did you know?

- The mountains of Lesotho and the Maloti Drakensberg are one of Africa's great water towers – a critical water source area.
- The water from this area supplies Gauteng, South Africa's biggest economic hub.
- Water is Lesotho's biggest export to South Africa. Phase 2 of the Lesotho Highland Water Project will be finished in 2020 at a cost of R20 billion.

Province: Eastern Cape/Free State (also borders Lesotho)
Level of protection: 1%
Headwater areas: Senqu-Orange
Main rivers: Caledon; Orange; Senqu
Free-flowing rivers: None
Interbasin Transfer Systems: Lesotho Highlands Water Project to Vaal
Dams: Katse; Welgbedacht; Knellpoort
Supplies water to: Gauteng & Free State provinces; some parts of Mpumalanga (Delmas; eMbalenhle); Uppington in the Northern Cape .
Ramsar Site(s): Ukhahlamba Drakensberg Park
Protected areas: Ukhahlamba Drakensberg World Heritage Site, Goldern Gate Highlands National Park, Ntsikeni Wildlife Reserve, Sterkfontein Dam Nature Reserve
Threats: large-scale cultivation; land degradation

LAND USE (%)



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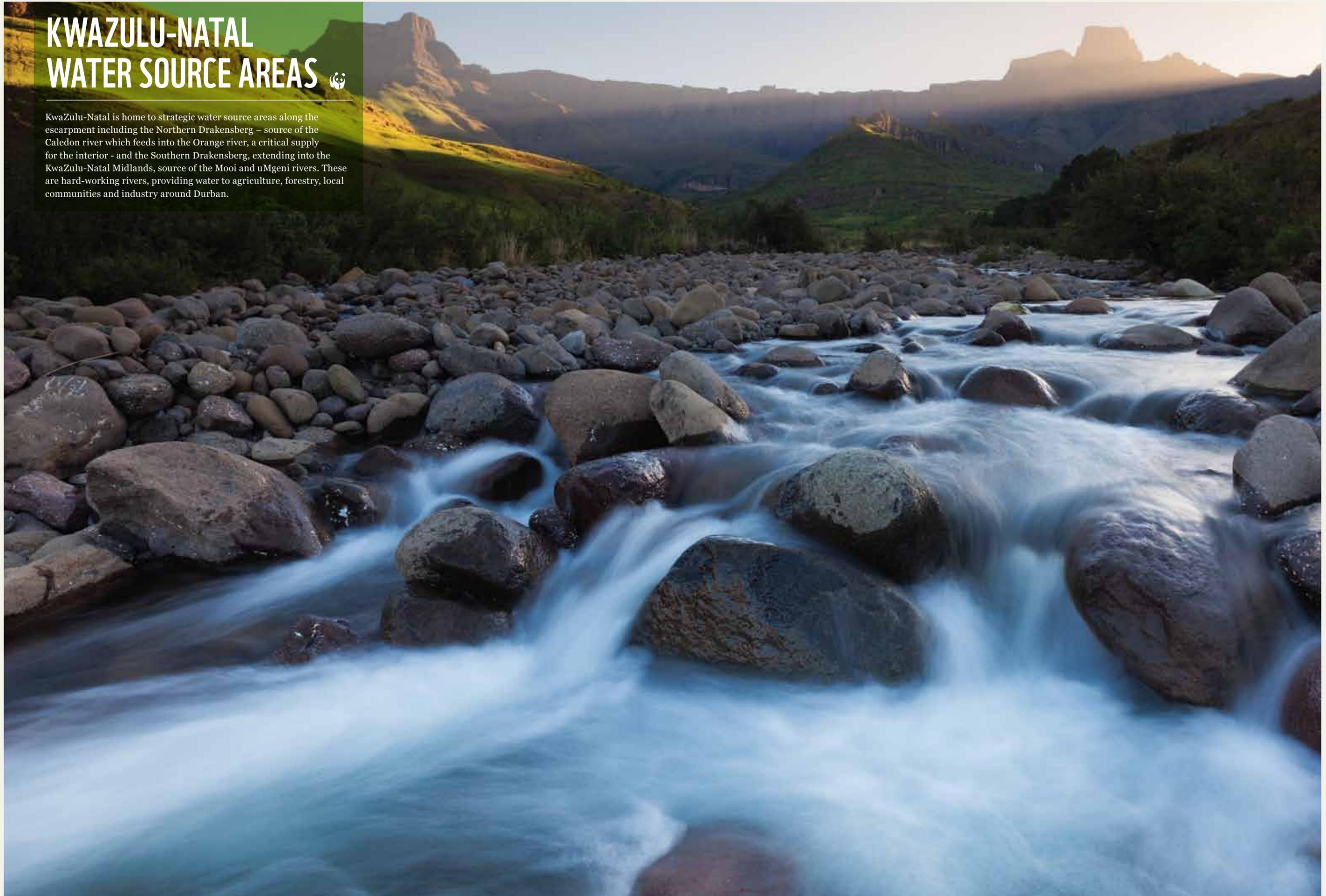


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“The majestic Maloti Drakensberg Mountain... not just a picturesque mountain but South Africa’s most important water source area, producing some 25% of our available water and supporting almost 50% of our GDP.”

KWAZULU-NATAL WATER SOURCE AREAS

KwaZulu-Natal is home to strategic water source areas along the escarpment including the Northern Drakensberg – source of the Caledon river which feeds into the Orange river, a critical supply for the interior - and the Southern Drakensberg, extending into the KwaZulu-Natal Midlands, source of the Mooi and uMgeni rivers. These are hard-working rivers, providing water to agriculture, forestry, local communities and industry around Durban.





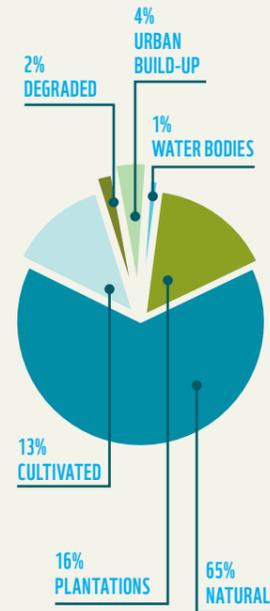
SOUTHERN DRAKENSBERG

Did you know?

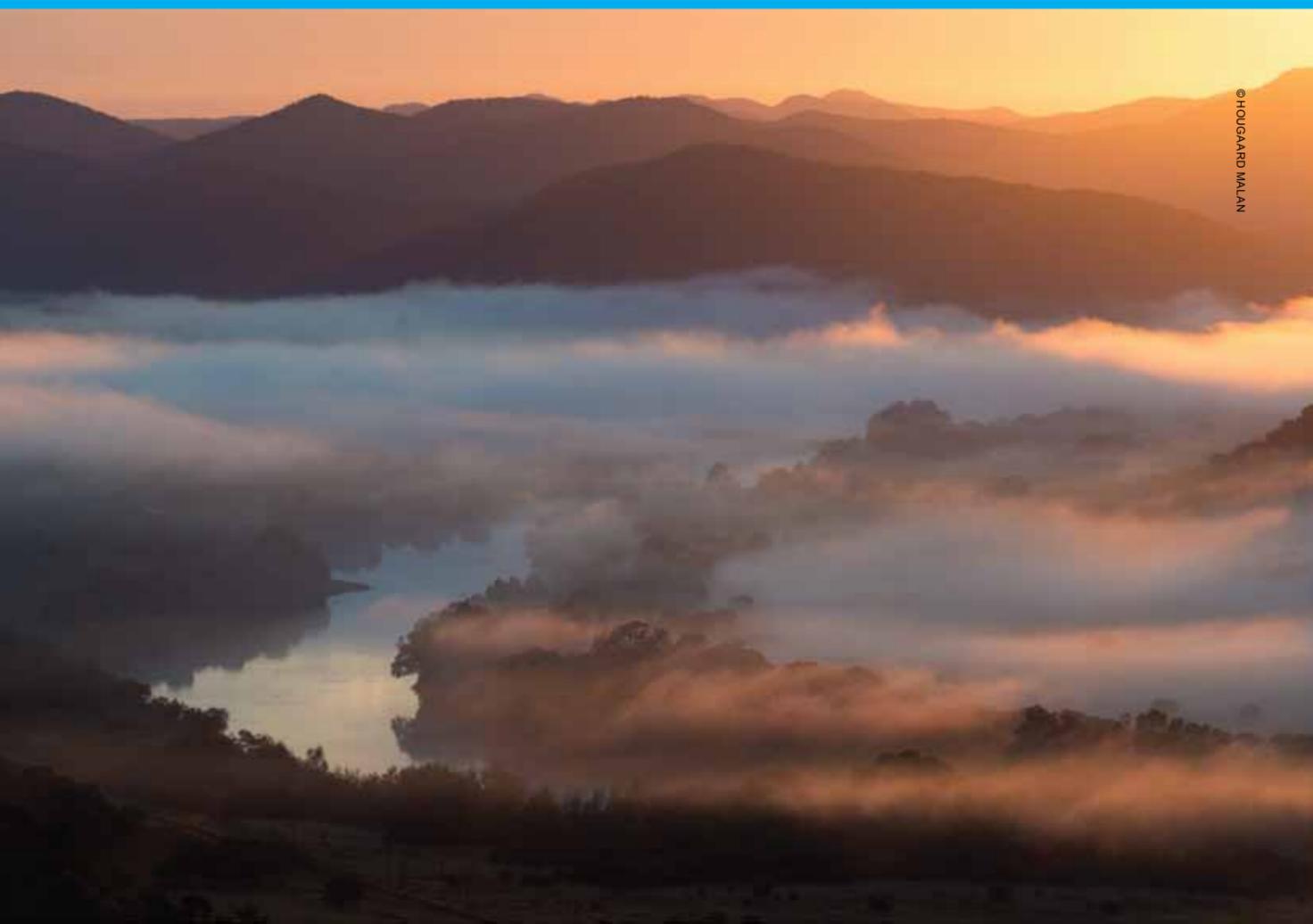
- The three highest mountains in South Africa, Mafadi (3 482 m high), Njesuthi and Champaign Castle are found in this area.
- The country's newest Ramsar site, the uMngeni Vlei, is found here.
- The longest free-flowing river, the Mkomazi, starts at this source.

Province: KwaZulu-Natal
Level of protection: 14%
Main rivers: uMngeni, Mooi, Thukela, Mkomasi. uMzimkhulu
Free-flowing rivers: Mtamvuna; Mkomazi; Mzimkhulu; Nsonge
Interbasin Transfer Systems: Mngeni to Umzimkhulu; Mooi-uMngeni to Springgrove dam
Dams: Midmar; Albert Falls; Wagendrift; Craigie Burn
Supplies water to: Parts of KwaZulu-Natal (Durban, Pietermaritzburg and Port Shepstone)
Ramsar Site(s): uMngeni Vlei
Protected areas: None
Threats: large-scale plantations; land degradation

LAND USE (%)



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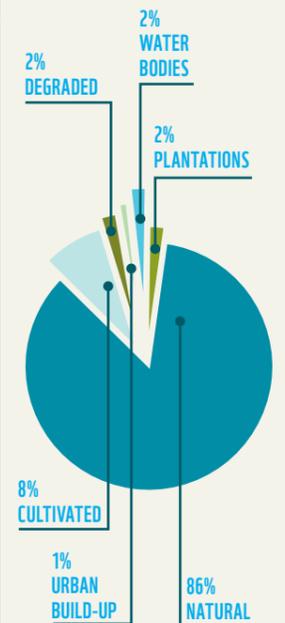
NORTHERN DRAKENSBERG

Did you know?

- This source area provides water to the economic hubs of Durban and Gauteng.
- The Orange river is South Africa's longest river – 2,200km – and has the largest dam – the Gariep Dam with a capacity of 5,340,000 megalitres (1 megalitre = 1mil litres).
- Gariep was the San name for the Orange River. It means 'great water'.
- South Africa's largest Ramsar site, the Ukhahlamba Drakensberg Park (formerly Natal Drakensberg Park), is here at 2428 km2.

Province: KwaZulu-Natal
Level of protection: 8%
Main rivers: Senqu; Caledon; Thukela; Orange; Vaal
Free-flowing rivers: None
Interbasin Transfer Systems: Thukela to Vaal Basin
Dams: Katse; Sterkfontein; Woodstock; Saulspoort; Driel Barrage; Spioenkop
Supplies water to: Gauteng and Free-State provinces; parts of the North West province (Rustenburg, Potchefstroom, Klerksdorp, Orkeney, Stilfontein, Wolmaranstad, Vryburg); parts of KwaZulu-Natal (Durban, Pietermaritzburg, and Port Shepstone)
Ramsar Site(s): Ukhahlamba Drakensberg Park (formerly Natal Drakensberg Park)
Protected areas: Royal Natal National Park (forms part of the uKhahlamba Drakensberg Park World Heritage Site); Golden Gate Highlands National Park
Threats: coal mining; land degradation

LAND USE (%)





MFOLOZI HEADWATERS

Did you know?

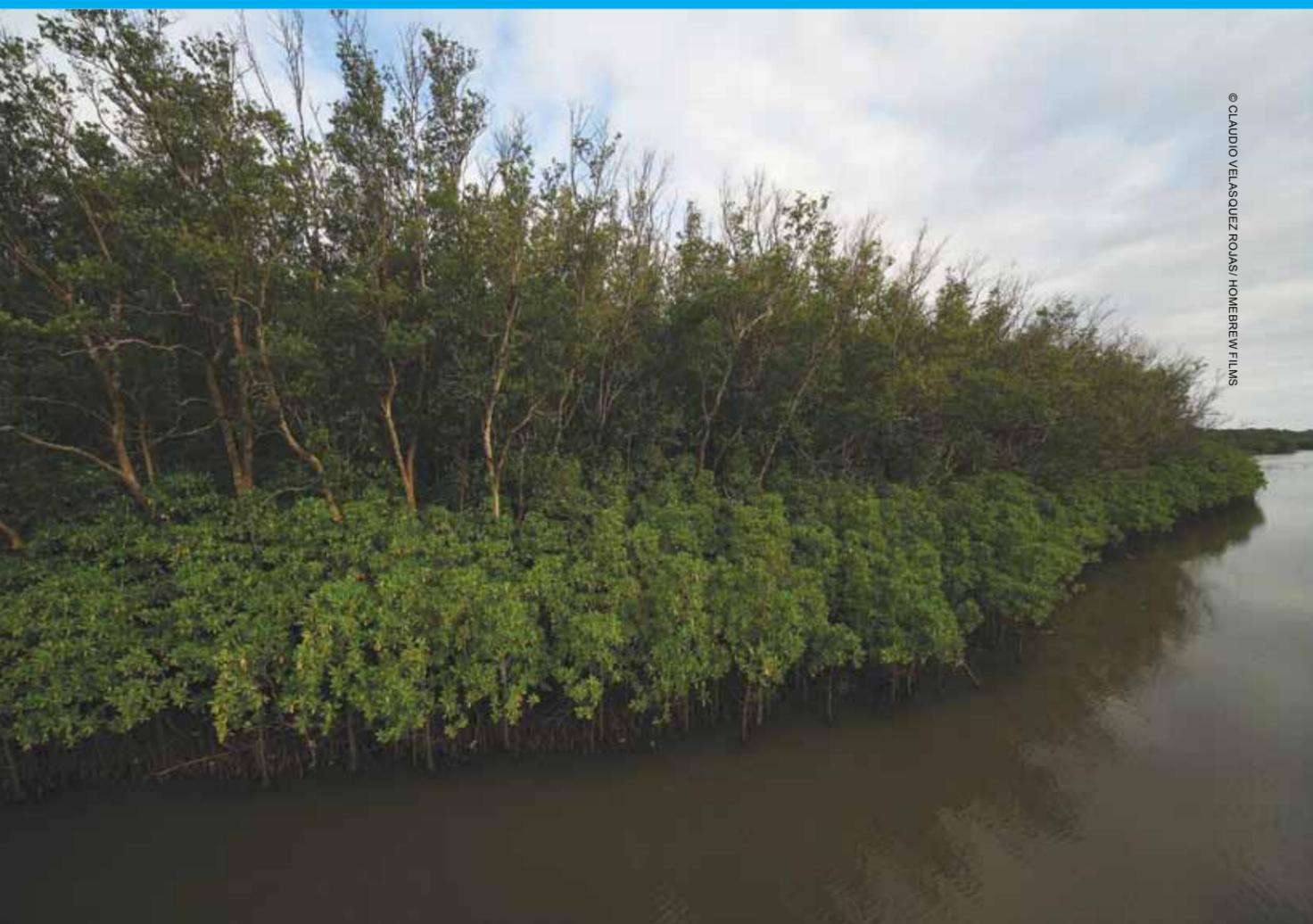
- The largest user of water in this area is the irrigation sector, predominantly sugarcane and forestry.
- All of southern Africa's 20 000 white rhinos came from a herd of less than 50 in the Mfolozi area.
- The Black Mfolozi River is a flagship river and it is free-flowing for more than 100 km.

Province: KwaZulu-Natal
Level of protection: 1%
Main rivers: Lenjane; Black Mfolozi; Pongola
Free-flowing rivers: Mkuze; Black Mfolozi; Nsonge; Nondweni; Ngogo; Mfulu; Nyalazi
Interbasin Transfer Systems: None
Dams: Hluhluwe
Supplies water to: Richard's Bay; Vryheid; eSikhawini
Ramsar Site(s): Kosi Bay, Lake Sibaya, St. Lucia System downstream
Protected areas: Hluhluwe uMfolozi Park
Threats: large-scale plantations; large-scale cultivation; coal mining; land degradation

LAND USE (%)



© PETER CHADWICK



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ZULULAND COAST

Did you know?

- This area is known as a burial ground to seven Zulu kings and home to the big five further north
- The Thukela river, which flows through the area, is the largest river in KwaZulu-Natal.
- The Thukela River flows over 500km from its source in the Drakensberg to the Indian Ocean.

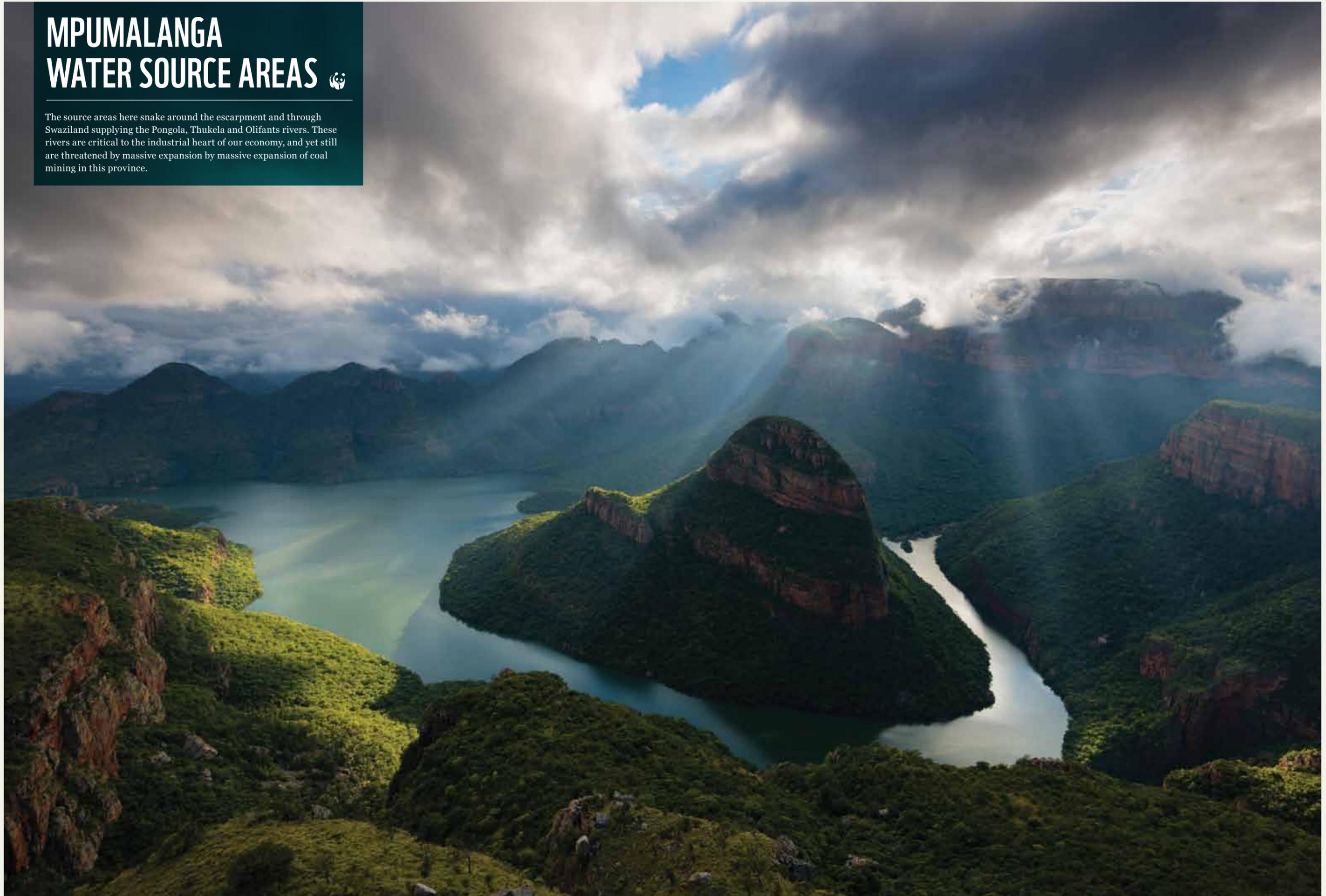
Province: KwaZulu-Natal
Level of protection: 6%
Main rivers: Mvoti; Thukela; Mhlatuze
Free-flowing rivers: Nsuze
Interbasin Transfer Systems: Thukela to Mhlatuze; Mooi to Mgeni Basin
Dams: None
Supplies water to: KwaDukuza; Mandeni; uMlalazi; uMhlatuze Municipalities
Ramsar Site(s): None
Protected areas: Ngoye Forest Reserve
Threats: land degradation, wildfires, Invasive alien vegetation

LAND USE (%)



MPUMALANGA WATER SOURCE AREAS

The source areas here snake around the escarpment and through Swaziland supplying the Pongola, Thukela and Olifants rivers. These rivers are critical to the industrial heart of our economy, and yet still are threatened by massive expansion by massive expansion of coal mining in this province.





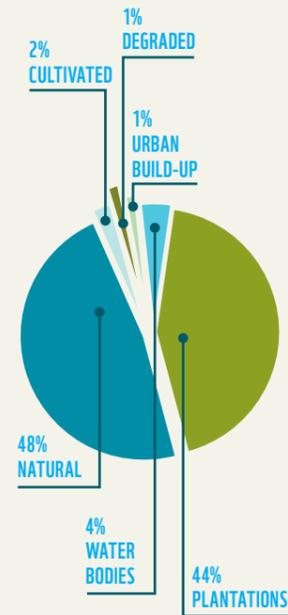
MPUMALANGA DRAKENSBERG

Did you know?

- This headwater supplies freshwater to the Olifants catchment which is already impacted by acid mine drainage.
- Approximately 6000 old mines in South Africa have been abandoned and some now leak AMD into nearby rivers. Coal and gold mines cause AMD.
- Coal is a double whammy: it pollutes water at the mine and causes climate change with the release of carbon.

Province: Mpumalanga
Level of protection: 9%
Main rivers: Elands; Sabie; Crocodile; Olifants
Free-flowing rivers: Elands; Mbyamiti; Nwanedzi-Sweni
Interbasin Transfer Systems: Usutu to Olifants Basin; Komati to Olifants Basin
Dams: Kwena; Da Gama; Vygeboom; Witklip; Klipkopjes; Blyderivierspoort, Inyaka; Ohrigstad; Buffelskloof; Klaserie; Drie
Supplies water to: Parts of Mpumalanga (Nelspruit; eMalahleni; Middleburg); Phalaborwa in Limpopo
Ramsar Site(s): Verloren Valei Nature Reserve
Protected areas: Kruger National Park downstream
Threats: large-scale plantations; coal mining; land degradation

LAND USE (%)



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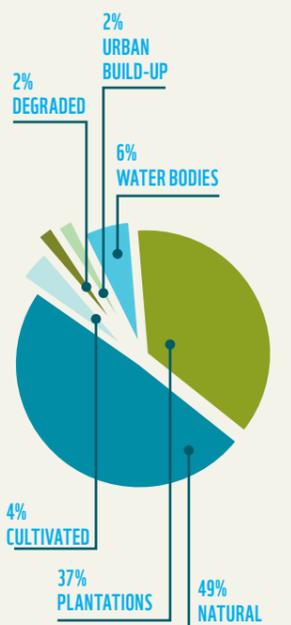
MBABANE HILLS

Did you know?

- The Inkomati River flows through South Africa, Swaziland and Mozambique.
- The Ntombe River flows from this area. It is a tributary to the Pongola and is one of only two flagship rivers in Mpumalanga. Flagship rivers are the most important free-flowing rivers in terms of their ecosystem processes and biodiversity value.
- More than 60% of South Africa's river run-off is shared with other countries. This stresses the need for all countries to be good water neighbours.

Province: Mpumalanga (borders Swaziland)
Level of protection: 3%
Main rivers: Usutu; Lusushwana; Inkomati; Pongola; Mpuluzi (in Swaziland)
Free-flowing rivers: None
Interbasin Transfer Systems: Usutu to Olifants Basin
Dams: Westoe; Driekoppies; Morgenstond
Supplies water to: Parts of Mpumalanga (Nelspruit, Standerton, Emerlo); Swaziland and Mozambique
Ramsar Site(s): None
Protected areas: None
Threats: large-scale plantations; land degradation

LAND USE (%)





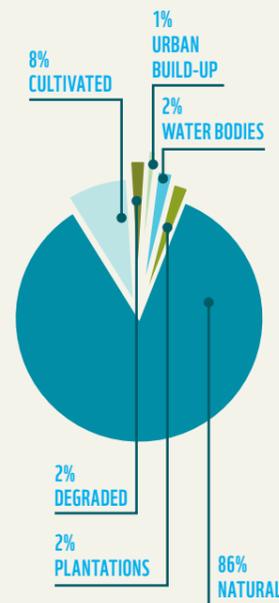
ENKANGALA DRAKENSBERG

Did you know?

- This source area supplies water to South Africa's economic hub, Gauteng, and it is also an important source for the agricultural sector in the KwaZulu-Natal and Free State provinces.
- The Drakensberg Mountains form the watershed between rivers flowing to the Indian Ocean via the Thukela flow or to the Atlantic Ocean via the Vaal and Orange.
- One of the country's largest interbasin transfer schemes is downstream and it transfers water from the Thukela to the Vaal, where it eventually reaches the Gauteng province.

Province: Mpumalanga
Level of protection: 1%
Main rivers: Vaal; Thukela; Pongola; Bivane; Assegaai; Wilge
Free-flowing rivers: Ntombe; Hlelo; Upper Vaal
Interbasin Transfer Systems: Assegaai to Vaal Basin; Buffelo to Vaal
Dams: Zaaihoek; Heyshope; Kipfontein; Pongolapoort; Nshingwayo
Supplies water to: Parts of Mpumalanga (eMbalenhle, Standerton, Delmas, Volksrust, and Ermelo); KwaZulu-Natal (Newcastle, Richard's Bay, Vryheid, Dundee, eSikhawini); Kimberley in the Northern Cape
Ramsar Site(s): Downstream - Kosi Bay; Lake Sibaya; iSimangaliso
Protected areas: Pongolapoort Nature Reserve downstream
Threats: coal mining; large-scale plantations; land degradation

LAND USE (%)



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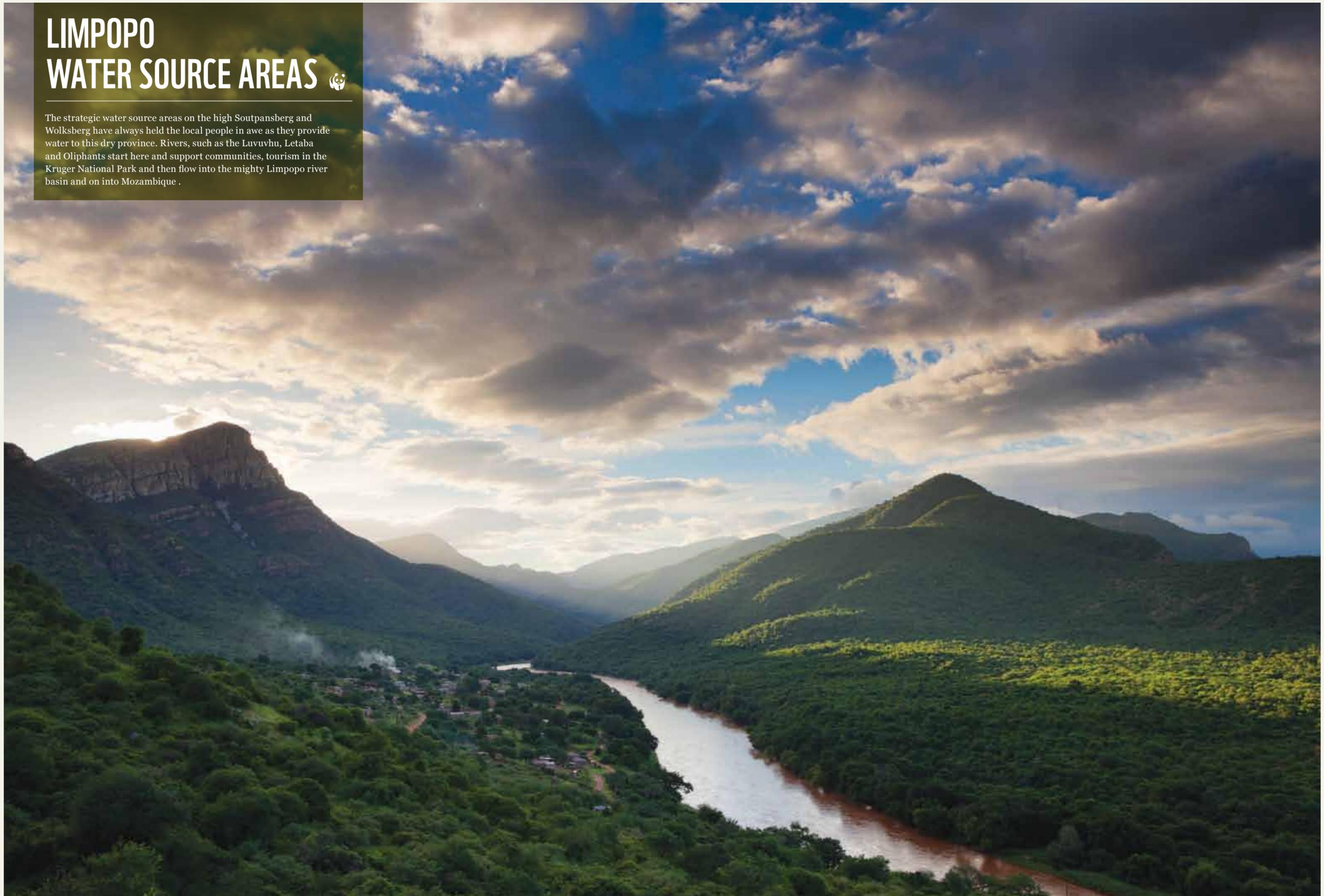


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“The Thukela headwaters not only provide much needed water for Gauteng, but dilute a heavily impacted system, keeping down treatment costs, energy requirements and meeting Eskom’s needs for clean water for energy production. However, these headwaters are threatened by a massive expansion of coal mining. South Africa is not a ‘coal-scarce’ country; we are however, a water-scarce country.”

LIMPOPO WATER SOURCE AREAS

The strategic water source areas on the high Soutpansberg and Wolkberg have always held the local people in awe as they provide water to this dry province. Rivers, such as the Luvuvhu, Letaba and Oliphants start here and support communities, tourism in the Kruger National Park and then flow into the mighty Limpopo river basin and on into Mozambique .





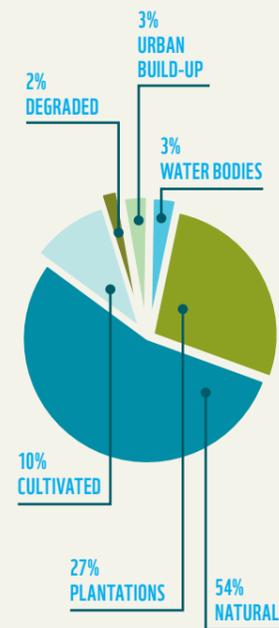
WOLKBERG

Did you know?

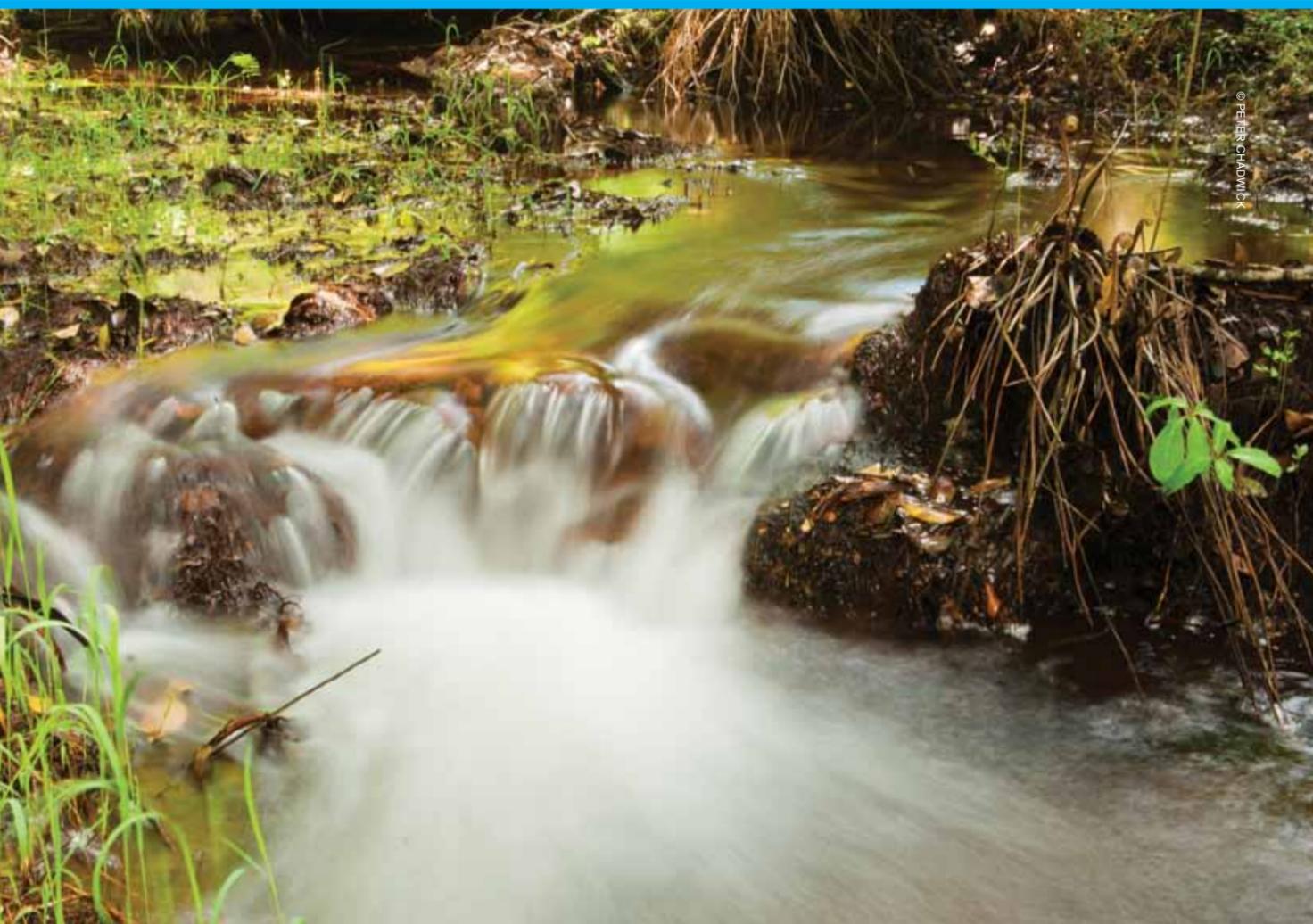
- The Letaba River flows through Kruger National Park, a key tourist attraction, and into Mozambique. It is home to hippos, crocodiles and other freshwater life.
- The east-west flowing rivers of the low-veld were part of ancient migration routes for herds of elephants, buffalo and wildebeest across southern Africa.
- The Letaba and Olifants rivers eventually flow into the Limpopo, the second longest river in South Africa.

Province: Limpopo
Level of protection: 22%
Main rivers: Middle Letaba; Ngwabitsi; Olifants
Free-flowing rivers: Mohlapitse
Interbasin Transfer Systems: Letaba to Sand; Olifants to Sand Basin
Dams: Tzaneen; Ebenezer; Magoebaskloof, Cramer; Middle Letaba; Phalaborwa Barrage
Supplies water to: Parts of Limpopo province (Polokwane & Tzaneen)
Ramsar Site(s): None
Protected areas: Wolkberg (Serals) Wilderness Area; Legalameetse Nature Reserve; Bewaarkloof Nature Reserve; Wolkberg Caves Nature Reserve
Threats: large-scale plantations; land degradation; climate change

LAND USE (%)



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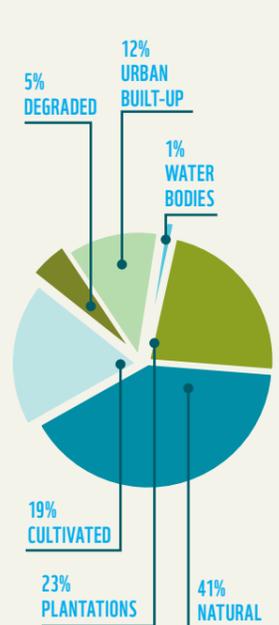
SOUTPANSBERG

Did you know?

- One of South Africa's largest freshwater lakes is here - Lake Fundudzi.
- This lake is a special spiritual place for the VhaVenda people. Legends tell of a python god which lives in the lake and cares for the crops.
- Major plans are underway to import more water to Limpopo to support mining development.

Province: Limpopo
Level of protection: 0%
Main rivers: Luvuvhu; Little Letaba; Mutale; Mutamba; Nzhelele
Free-flowing rivers: Mutale-Luvuvhu
Interbasin Transfer Systems: Luvuvhu-Limpopo
Dams: Mutshedzi; Nwanedi; Nzhelele; Nsami; Middle Letaba
Supplies water to: Louis Trichardt; Thohoyandou
Ramsar Site(s): None
Protected areas: None
Threats: large-scale plantations/cultivation; land degradation

LAND USE (%)





Towards a water-secure South Africa

WWF South Africa, together with like-minded partners, works to build a future in which healthy freshwater systems underpin the country's development and enhance the quality of life for all our people.

PROTECTING SOUTH AFRICA'S WATER SOURCE AREAS

Three quarters of South Africans can turn on a tap and receive good quality drinking water. Because our needs for water are met, we tend to not think about where our water has come from and the journey it has taken to reach us.

Most Cape Town residents don't realise that their water is a blend of Table Mountain springs, Boland Mountain Rivers and water from the Breede valley. Similarly, most residents in Gauteng are not aware that they receive water that has been pumped uphill from the catchments in Mpumalanga Drakensberg, the Enkangala Drakensberg and Lesotho.

South Africa's earliest inhabitants have always recognised the value of water. Our oldest Khoi-San names for many settlements reflect the importance of water: Camissa – place of sweet waters (Cape Town); Gariep – great water, Tsitsikamma – place of abundant waters. But now our water comes from source areas that are often far away; we are disconnected from the natural sources by kilometres of pipes and distribution networks. Most of us do not know whether our local vleis and streams are healthy. It's important that we reconnect with our sources of our water and ensure that they are adequately protected. We need to stand up for our right to a healthy environment and the rights of the next generation to inherit a country with intact water source areas.

Our Department of Water Affairs is mandated to be the custodian of our nation's water resources. The second National Water Resource Strategy (2013) outlines the department's intentions to meet the challenges of water resource management in the coming five years. Catchment Management Agencies (CMAs) will be set up to give effect to coordinated land and water development. Effective and capacitated CMAs and the Department of Water Affairs are critical to ensuring sufficient protection and sustainable use of water.

Many levels of competent government are required to ensure the strategic policies and planning, effective implementation of protective measures and coordinated regulation of water-users. This includes the National Planning Commission, the Department of Water Affairs and impacting departments such as Agriculture, Forestry, Fisheries; Rural Development and Land Reform, Mineral Resources as well as the Environmental Affairs Department.

The private sector is also starting to play a more active role through water stewardship and investing in ecological infrastructure and catchment restoration. WWF South Africa enables corporates, farmers and other water users to cooperate with one another to invest in their source areas and reduce water risk. Several other NGOs, such as the Wildlife and Environment Society of South Africa (WESSA) and the Centre for Environmental Rights (CER) are also actively bringing people together and building local capacity to care for our water resources.

There is plenty of scope to be an active water citizen in South Africa and to do your part to protect our water source areas, rivers, and wetlands. Find out where your water comes from and begin your own journey of water. For more information on the *Journey of Water*, please visit www.journeyofwater.co.za



10 000 million m³ of surface water and 2 000 million m³ of groundwater are allocated for annual use.



8%
OF SOUTH AFRICA'S LAND AREA PRODUCES 50% OF OUR RUN-OFF - THIS 8% FORMS OUR WATER SOURCE AREAS.

9%
OF RAINFALL ENDS UP AS RUN-OFF IN OUR RIVERS 4% RECHARGES OUR AQUIFERS.

21%
OF SOUTH AFRICA RECEIVES LESS THAN 200 MM OF RAIN A YEAR.

4,395
REGISTERED DAMS IN SOUTH AFRICA.

60%
OF FRESHWATER ECOSYSTEMS ARE THREATENED 65% OF WETLAND ECOSYSTEMS ARE THREATENED.

66%
OF OUR WATER IS USED BY AGRICULTURE.

1800MM P.A.
OUR AVERAGE RATE OF POTENTIAL EVAPORATION IS MORE THAN 3 TIMES THE RAINFALL.

SOUTH AFRICA'S WATER BY NUMBERS



16%

of South Africa's water source areas are protected.

4%

of our river length is free-flowing and out of the 62 free-flowing rivers, only 25 are longer than 100km.



490mm p.a.

South Africa's rainfall is half the global average.

98%

available reliable water has already been allocated.

37%

of water is lost once it enters our engineered distribution systems (non-revenue water).



Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

www.wwf.org.za