

# The River Story Books



## The Gouritz River





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## General

### How are rivers formed?

Are you aware of the fact the rivers are one of the sources of fresh water.

The points of origin of most of the rivers are mountains.

A natural stream of freshwater flowing downhill from its source in the mountains to meet an ocean or a lake is known as a river. The river water is confined to a channel or a stream bed.

The rivers are formed when group of springs and streams known as headwaters having their origin in the mountains flow down to form a large stream or springs. The stream bed of a river lies between the banks of a river. The large streams are called a river while the smaller ones are called creeks, brooks, rivulets or tributaries.

The rivers form the major component of the water cycle. The water in a river is accumulated from precipitation of ground water and also through the release of stored water in natural reservoirs such as glaciers.

Every river in this universe has a point of origin and the gravity plays a significant role in the direction of the flow of a river.



### Do you know what a river catchment is?

The river catchment, or drainage basin, is all the land from the mountain to the seashore, drained by a single river and its tributaries. Catchment areas vary greatly in size - a big river may have a catchment area of several thousand square kilometres, whereas a smaller tributary will have a catchment area of only a few hectares.

Catchments are separated from each other by watersheds. The characteristics of any river (physical, chemical, biological) are determined by the nature of the catchment and the activities, both human and natural, that take place in it.





## Overview of the Gouritz River

The Gouritz River is the main river within the area. It originates in the Great Karoo and enters the Indian Ocean at Gouritzmond. Major tributaries of the Gouritz River are the Groot, Gamka and Olifants rivers. The Goukou and Duiwenhoks rivers are small rivers draining the Langeberg Mountains and flow over the coastal plains, west of Mossel Bay. The main rivers of the Garden Route, east of the Gouritz River, are the Hartenbos, Klein Brak, Groot Brak, Knysna, Bietou, Keurbooms, Groot and Bloukrans.

The Gouritz River is one of the major rivers along the South Coast.

The mouth of the Gouritz River is approximately 330 km east of Cape Town and 30 km west of Mossel Bay. The river is approximately 416 km long.

About 20 km north of the mouth the river flows through a deep gorge and the historic road bridge which was famous for bungy jumping.





## Tributaries

A tributary is a stream or river that flows into a larger stream or main stem (or parent) river or lake. A tributary does not flow directly into a sea or ocean.

A confluence, where two or more bodies of water meet together usually refers to the joining of tributaries.

### Touws River



Touws River in flood

This tributary rises in the Matroosberg Mountains and flows east through Touwsrivier and south into the Little Karoo, where it joins the **Groot River**.



Grootrivier near Vanwyksdorp, 31/12/2007, eWISA

### Buffels River



Buffels River \_Laingsburg

April 2009

eWISA

**Buffels River** - tributary rises in the Great Karoo and flows south through Laingsburg and the Klein Swartberg Mountains into the Little Karoo. It eventually becomes the Groot River about 50km before its confluence with the Touws River, and then flows east, past Van Wyksdorp, to its confluence with the Gouritz River.

### Gamka River



Gamka River

7 April 2009

eWISA

The main tributaries of the Gamka River, viz. **Dwyka, Koekemoers and Leeuw**, rise in the Great Karoo, converge and flow southwards through the Swartberg Mountains.

The **Olifants River** joins the Gamka River south of Calitzdorp. Together these become the Gouritz River.

## Topography



*Topography is a detailed map of the surface features of land*

The topography within the Gouritz water management area (WMA) is such that three distinct water resource zones can be distinguished. These are:

- ~ The semi-arid Great Karoo consisting of the Gamka River catchment to the north of the Swartberg Mountains and the Touws/Bufels/Groot River catchments, to the west of the Klein Swartberg Mountains

- ~The Olifants River which is fed by mountain streams rising in the Swartberg Mountains to the north, the central Kammanassie Mountains and the coastal Outeniqua Mountains in the south.

- ~The Coastal Belt which includes the Gouritz/Goukou/Duiwenhoks catchments, extending from the western boundary of the WMA to (and including) the catchment of the lower Gouritz River, and the remaining coastal belt to the eastern boundary of the WMA

The origin of the Gouritz River is in the Groot Swartberge, however important tributaries such as the Dwyka and Buffels Rivers drain the southern slopes of the Roggeveld mountains in the "Moordenaarskaro" and the Olifants River the area at Oudthoorn between the Groot Swartberge and the Kammanassieberge. It was during a flood of the Buffels River when more than 100 people drowned in Laiingsburg in 1981.

## Geology

The Klein Karoo which lies to the north of the Langeberge and is 6-8 miles wide. The Groot and Gamka tributaries arise here. This area belongs to the Bokkeveld Group and consists of sandstones and shales. The latter crop out everywhere both on the hills and the plains. The geological setting of the Gouritz WMA is complex due to the wide range of Groups, Sub-groups and Formations. The older rock types in the area are mainly part of the Kaaiman/Kango and Table Mountain Groups. They have a predominantly west-east trend and are significantly folded. These rock types are part of the southern portion of the Cape Feld Belt. North of the Laingsburg/Prince Albert line of latitude the Karoo basin starts occurring with predominantly argillaceous rock types which constitute flat lying sediments of the Karoo. To the north of Beaufort West dolerite dykes and sills start outcropping.



**The Langeberge** - this mountain range runs from east to west and belongs to the Table Mountain Group.

**The Renosterveld** lies to the south of the Langeberge. It comprises the Uitenhage Group of thin bedded shales, red and gray mudstones, conglomerates and clays; the Witteberg Group of quartzites and the Bokkeveld Group of shales, quartzites and sandstones.

**The Strandveld** forms the 12 -13 km coastal belt. There are shingle beaches at the Gourits mouth and the mainland is mostly sandy. There are extensive mobile dunes rising in terraces of 100m in places. The extensive hilly areas of the strandveld are fixed sand intersected by rocky ridges and outcrops of dune limestone. The Coastal Belt comprises superficial deposits, recent limestones, recent blown sands and sand deposits. The dune limestone is derived from the hardened dunes and is used for building purposes. The channel of the river has cut through the sand and limestone down to the underlying Bokkeveld beds which are exposed. Near the river mouth, the Table Mountain Group (sandstone and quartzites) appears as a narrow strip. There is a large quantity of alluvium at Elberts Kraal on the Gourits River. On the northern boundary of the Strandveld stands the Aasvogelberg belonging to the Table Mountain Group.





## Hydrology

The Gourits River's catchment stretches from the Karoo down to the coast. It is the third largest catchment in South Africa being only slightly smaller than that of the Olifants River on the west coast, the Orange being the largest.

The Gourits River is fed by numerous large tributaries, the main ones being the Grootrivier, the Gamka and the Olifants. The Grootrivier in turn is fed by the Buffels River which rises on the southern slopes of the Nuweveldberge and flows southwards through the town of Laingsburg in the Great Karoo. From here it cuts through the Klein Swartberg mountains and flows into the Little Karoo where it enters the Grootrivier. At this junction it is joined by the Touws River flowing in from the west. From this point the river flows in an easterly direction before bending to the south where it joins the Gourits.

The Gouritz River and its tributaries (the Gamka, Groot and Olifants Rivers) drain an area of 45 702 km<sup>2</sup>. The main stem of the river is 267 km long from its source in the Great Karoo to Gouritzmond where it enters the Indian Ocean ). The other numerous short reach coastal rivers drain an area of 7 437 km. The total area of the water management area is 53 139 km<sup>2</sup>.



Gouritz River

March 2008

Alice Botes



## Geohydrology

In the interior catchments of the Karoo and Olifants River, runoff from many of the catchments in the Swartberg, the Outeniqua and Langeberg Mountains is perennial and the normal flows are diverted into farm dams or into earth canals for run-of-river irrigation on a shared basis. Flood runoff from these mountains and from the Great and Little Karoo is also used for opportunistic run-of-river irrigation, but most is stored in dams for later use by irrigators, the largest of these being the Kammanassie, Stompdrift and Gamkapoort Dams. Lucerne is the dominant crop irrigated by run-of-river, whilst the Gamkapoort and Calitzdorp Dams supply water primarily for vineyards and fruit production. Groundwater is used extensively for water supply to the urban sector, and for rural domestic use, stock watering and irrigation to a lesser extent.

Groundwater plays an important current and potential role as a source of supply, particularly in the drier regions of the Karoo and Little Karoo, where surface water runoff is predominantly in the form of flash floods, and there is very limited base flow. Groundwater supplies in these areas have a higher assurance of supply than surface water even when this is stored in dams, because of the irregular nature of flood runoff and the high evaporation rates, which impact assurance of supply.



## Overview

The upper reaches of the Gouritz River in the Great Karoo are mostly in a good ecological state, while the middle and lower reaches are in a fair to poor ecological condition as a result of agricultural and urban development. Invasive alien plants and fish have had a major impact on the biodiversity and ecological functioning of rivers in the Gouritz water management area and their existence threatens the status of all endemic species. Portions of the area are protected through conservation initiatives such as the Gouritz Biodiversity Initiative and the Garden Route Initiative and these, in conjunction with conservation projects, have improved the conservation status of the area.

## Aquatic Animals

This water management area falls within the Cape Floristic Region, a unique freshwater fish ecoregion in South Africa, characterized by a low overall indigenous fish diversity (19 species).

The very large Gouritz system which has six of the nine species. The smaller coastal systems usually have three species, viz. a redfin, Cape kurper and Cape galaxias.

Chubbyhead barb, Forest redfin, Keurbooms redfin, Moggel, Longfin eel and Giant Mottled eel are some of the species found in the Gouritz river.

### *Aquatic Insects:*

Water beetles occur in freshwater rivers.

Stoneflies are restricted to unpolluted, well-oxygenated rivers where the nymphs occur under stones and the adults can be spotted as they climb on the rocks.

## Terrestrial Animals

The many dams, pans and vleis of the area provide ideal habitat for a variety of animals such as the Cape clawless otter, the African Fish Eagle and the Knysna Lorie.

Cape Clawless Otter: they are frequently found in and along rivers, small streams and coastal rock pools where they forage for octopus, frogs, crabs, crayfish, or even insects, birds, bird eggs and reptiles.

## Vegetation



Knysna Lorie

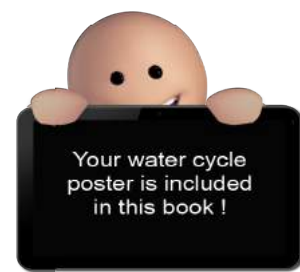
The typical vegetation of the Succulent Karoo is a dwarf shrubland comprising mostly of leaf succulents (Mesembryanthemaceae, Crassulaceae, Asteraceae and Asphodelaceae). The dominance of leaf succulents (some 1 700 species) in this biome is unique among the deserts of the world. Stem succulents, comprising about 130 species, include species of euphorbia, tylocodon, othonna and numerous stapeliads. Seasonal bulbs appear in the open spaces between the shrubs and provide magnificent spring displays. The hilly areas of the Little Karoo have abundant evergreen shrubs and tall aloes.

The Gouritz water management area incorporates three important biomes that have been identified by the Gouritz Initiative as hotspots for the Global Biodiversity Conservation Project, viz. Fynbos, Thicket and Succulent Karoo. Fynbos is a shrubland, comprising hardleafed, evergreen, fire-prone shrubs, and is characterised by four major plant types:

- ~restioids (elegant restio),
- ~ericoids (common heath, vlakke heath),
- ~proteoids (king protea, sugarbush) and
- ~bulbs (watsonia, cluster disa).







## Temperature

In the Great Karoo and central Olifants River regions, the hot dry Karoo climate predominates. Along the southern coastal strip, the climate is more temperate with significantly higher rainfall.

The temperature ranges between 16°C along the south-east coast to 17°C in the interior. maximum temperatures of up to 41°C is experienced during February.

## Rainfall

The Gourits River and its tributaries are situated in an area of relatively low rainfall.

Precipitation over much of the area is from cold fronts approaching from the south-west, with very high rainfall on the parallel lying, coastal side of the mountains. Precipitation decreases rapidly further away from the mountain ranges, to the extent that the inland regions of the Great Karoo and Olifants River catchments are semi-desert areas. The Karoo normally receives most of its rainfall from thunderstorm activity during the period from February to April. Along the south-west portion of the area, high rainfall occurs in the months of April to August.

About twice a year, in winter and spring the Langeberg and Outeniqua mountains are snow-capped.

Gouritz Bridge N2



## Agricultural

Land-use in the arid areas, consists of mainly sheep and ostrich farming. In the slightly wetter Lettle Karoo there is extensive irrigation of lucerne, grapes and deciduous fruits. The coastal belt land-use is dominated by forestry and dairy farming.

*Sheep:* Merinos (wool) - Dorper (mutton)

*Goats:* Karoo and Angora

*Crops:* Lucerne, wheat and oats

A small area at "Die Poort" is under vines, apricot and peach orchards. A few citrus orchards are present in the lower catchment, as well as vegetable patches.

*Ostriches* are farmed in this area



anwyksdorp, 31/12/2007, eWISA

## Nature Conservation, Reserves and Tourism

### Tourism

There are two main routes through the Gouritz Cluster Biosphere Reserve - the N2 highway between Cape Town and Port Elizabeth, and Route 62 which travels through the Klein Karoo. Via the N2, at least a million visitors pass through the Langeberg and St Blaize sectors every year. Route 62 has been a growing tourist corridor through the Towerkop and Kammanassie sectors and it is estimated that at least 300 000 tourists visit the Cango Caves – arguably the most popular single attraction in the Klein Karoo – near Oudtshoorn every year.

Tourists have already indicated that one of the main attractions to the region is the unspoilt landscapes and the rich biodiversity of the region, but that the latter is not easily accessible. During the Gouritz Initiative phase of the project, a new destination was successfully championed, namely the Donkey Trail ([www.donkeytrail.com](http://www.donkeytrail.com)) over the Swartberg Mountains and hence availing access to unknown parts of this World Heritage Site.

### The Donkey Trail

Die Hel in the Gamkakloof Valley was first inhabited by farmers in 1830. It was accessible only by foot until 1963 when a road was built winding from the Swartberg Pass down into this remote valley.

Before the road, a 'donkey trail' over the Swartberg Mountain from Calitzdorp to Die Hel was the only commercial life line with the outside world. This historic 'donkey trail' starts at Hans and Erika Calitz family farm Living Waters near Calitzdorp. [www.donkeytrail.com](http://www.donkeytrail.com)





## Tourism

Dolphin-spotting and whale watching. Bryde's whales and orcas visit throughout the year, but the Southern Right whales, which visit in winter and spring (between June and October), offer the best sightings.

Hiking and mountain biking are popular tourist activities and various trails along the coast and inland offer spectacular scenery, abundant animal life and amongst the most diverse number of plant species in the world.

Private game reserves along the coast and in the Klein Karoo offer accommodation, bird-watching and wildlife experiences with elephants, lions, rhinos, wildebeest and zebra, either with guided tours in 4x4s or on foot. Hiking trails and camping are offered at the provincial Nature Reserves (administered by CapeNature) which form part of the core area.

## Nature Reserves

Gourikwa Private Nature Reserve is situated along the Garden Route, world renowned for its breathtaking coastline. It is well known for its incredible beauty and abundant biodiversity.



## Populated Places

**Albertinia:** It was laid out in 1900 on the farm Grootfontein and became a municipality in 1920. The name is derived from the surname of Johannes Rudolph Albertyn (1847-1920), the first Dutch Reformed minister to serve the community.

**Calitzdorp:** The farm, on which Calitzdorp stands, was granted to JJ and MC Calitz in 1831. In 1924 a railway line was opened, in 1937 electrification and a new cement road to Oudtshoorn was completed.

The Swartberg (in the North), Rooiberge (to the South) and the Mountains of the Huisrivier Pass (to the West) surrounds Calitzdorp's challenging landscape with floods, droughts and extreme weather, from very hot to snow clad mountaintops in the winter.

**Gouritzmond:** is a small coastal town in the Hessequa Local Municipality, under the Eden District Municipality in the Western Cape province of South Africa.

The Gourits River mouths here into the Indian Ocean. "Die Mond", as it is nicknamed, is a popular fishing location.



**Laingsburg:** On 25 January 1981, in Laingsburg's centennial year, the largest part of the town was swept away within minutes by one of the strongest floods ever experienced in the Great Karoo. After a cloud burst to the north-eastern hinterland, south of the Komsberg, a massive wall of water rushed down the Buffels River and swept away everything it encountered in its way. Animals, humans and their possessions were swept along and later dumped under meters of silt. Hydrologists estimate that a flood in Laingsburg of this magnitude has a recurrence interval of once, on average, every 100 years.

**Oudtshoorn:** the "ostrich capital of the world", [3] is a town in the Western Cape province of South Africa. Two ostrich-feather booms, during 1865-1870 and 1900-1914, truly established the settlement. [4] With approximately 60,000 inhabitants, it is the largest town in the Little Karoo region. The town's economy is primarily reliant on the ostrich farming and tourism industries. [5] Oudtshoorn is home to the world's largest ostrich population, [6] with a number of specialized ostrich breeding farms, such as the Safari Show Farm and the Highgate Ostrich Show Farm.



Other places of interest:

- ~De Rust
- ~Herbertsdale
- ~Ladismith
- ~Prince Albert
- ~Van Wyksdorp
- ~Zoar



## Gamkapoort Dam

The Gamkapoort Dam near Prince Albert was completed in 1969. The dam is 42 m high and 231m long, with a maximum capacity of 37 million cubic metres.



Gamkapoort Dam, 31/12/2007, eWISA



Stompdrif Dam, Department of Water Affairs and Forestry

## Stompdrif Dam

The dam was designed as a multiple dome structure supported by a left rock flank and three buttresses. An earth flank on the right bank completed the picture.

Stompdrift dam was finally completed in 1965 with a maximum capacity of 49,6 million cubic metres. The height of the dam above the lowest foundation level is 49m and the total crest length is 364m.

## Buffelsjag Dam

Buffeljags Dam is a gravity/earth-fill type dam on the Buffeljags River, near Swellendam, Western Cape, South Africa. It was established in 1967 and renovated in 1983. Its primary purpose today is for irrigation use.

It is a combination gravity and earth fill dam, 24 m in height and 355m long. Total capacity is 5,2 million cubic metres.



Buffelsjag Dam

2 August 2006

Hydro WC DV

## Other dams:

- ~Floriskraal
- ~Kammanasie
- ~Prinsrivier
- ~Oukloof

# The Gourits Estuary

## General

The Gourits River Estuary is situated approximately 27 km south of the N2 highway between Albertinia and Mossel Bay.

The estuary is permanently open to the sea, is marine-dominated and extends for about 8km to the causeway at "Die Eiland". The estuary is at the receiving end of all the activities that take place in the catchment (water abstraction, siltation and infestation by alien plants).



## Residential

The small resort of Gouritsmond is situated on the west bank of the estuary near the mouth. The closest towns are Albertinia, Vleesbaai and Mossel Bay.



## Agricultural

The main farming activities are sheep and cattle farming and fodder crops. The cattle are mostly for meat production, but a few dairy herds are also ept. The crops include lucern, siradellon and oats. Wheat and maize were also cultivated in the area in 1989.

## Recreational

The estuary itself is used for water sports, such as power boating, water skiing, canoeing, yachting, swimming and angling. Prawns, used for bait, are collected from the mudflats in the estuary.



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