

BULB CAPITAL OF THE WORLD

WHAT'S SO SPECIAL ABOUT NIEUWOUDTVILLE

The great diversity of flowers, and particularly geophytes, that occur on the Bokkeveld is what makes Nieuwoudtville both special and different from the rest of Namaqualand.

The diversity of geophytes is particularly astounding. The area around Nieuwoudtville has 309 species of geophyte. To put this in perspective, there are about 1551 geophytes in the entire Cape flora and this is 4-5 times richer than other Mediterranean regions such as California, Western Australia, and the Mediterranean basin. In good rainfall years the display of spring annuals around Nieuwoudtville transforms the landscape into a picture of colour, and when these have set seed there are still many interesting flowers to be found long after the first flush of spring.

To get the most out of the Bokkeveld, you must take your time, don't rush along. It is not uncommon to find up to 50 different species within one square metre of renosterveld! Take the time to examine the array of flower shapes, colours and patterns that make each species unique. Notice the strangely twisted stamens of the *Sparaxis elegans* flowers, the metallic gloss of the Blue pride-of-Nieuwoudtville (*Geissorhiza splendidissima*) or the patterns in the *Gazania* and *Arctotis* flowers that mimic beetles. Are these to attract beetles by tricking them with the promise of a mate, or keep them away with the sign of a full house? There are so many different types, colours and shapes of flowers that in the end one's head is left spinning!

The pleasures of Nieuwoudtville are like an expensive champagne, to be enjoyed slowly, taking in the delights of each sip and always leaving you wanting more...

VEGETATION TYPES IN THE NIEUWOUDTVILE AREA

A remarkable aspect of the vegetation of the Nieuwoudtville area is that there are at least four vegetation types within 10 km of the escarpment.

Fynbos, with characteristic species of proteas and restios, occurs along the escarpment on the nutrient poor sandstone soils. Adjacent to this lies a band of **renosterveld** on the grey-coloured tillite soils. For most of the year, renosterveld vegetation seems to be made up only of shrubs such as kapokbos (*Eriocephalus purpureus*) and renosterbos (*Elytropappus rhinocerotis*). This dull-coloured vegetation is spectacularly transformed in spring when the veld is carpeted with displays of annuals and geophytes. Although much renosterveld has been lost to wheat fields, some good examples can still be seen on the farm Glenlyon, along the 'trekpad', and along the Oorlogskloof road towards Papkuilsfontein.

Alongside the renosterveld lies another type of vegetation that is unique to the Nieuwoudtville area, known as **Nieuwoudtville dolerite renosterveld**. This occurs on the heavy red dolerite clay soils that lie to the east of the town, and is dominated by annuals and geophytes with very few shrubs. Indeed, to those unaccustomed with it, the open dolerite plains may look more like old lands, but in fact contain a great diversity of bulbs and annuals.

A conspicuous feature of the Nieuwoudtville landscape is the low dolerite ridge (koppies) that lies about 1 km east of the town. The vegetation here consists of shrubs, grasses and a few trees such as wild olives and rock figs. There is a short trail in the

Nieuwoudtville Wild Flower Reserve that runs through the attractive koppies and provides an excellent opportunity to examine the vegetation close up.

The strong rainfall gradient, from almost 800 mm along the escarpment down to about 350 mm or less at Nieuwoudtville, and decreasing towards Calvinia is just as important for vegetation change as the changes in the geology and soils. The vegetation to the east of the koppies, known as succulent karoo, is dominated by low shrubs and vygies that are able to withstand the low rainfall and long summer drought. A 20 km trip along the R27 from the top of Vanrhyn's Pass towards Calvinia provides an excellent opportunity to examine these remarkable changes in the vegetation that contribute to making Nieuwoudtville so unique.

NIEUWOUDTVILLE HISTORY

The Khoi San inhabited this area for many centuries before the first settlers arrived in about 1730, and local rock art in Oorlogskloof Nature Reserve and on farms around Nieuwoudtville bears witness to an ancient culture that flourished here. During this period vast herds of game periodically roamed the plains of the Bokkeveld plateau, after which it derived its name. In the late 1700s wild herds had been replaced by large herds of sheep and cattle belonging to the settlers. The early settlers established themselves close to the present town of Nieuwoudtville at Groenrivier and Willemsrivier, where the first formal church building still stands. Carl Peter Thunberg and Francis Masson were the first botanists to visit the area. They reported staying at the farm of Klaas Losper, who owned "upwards of 12 000 sheep and 3 000 bullocks". Ironically Thunberg and Masson passed through the area in November 1774, missing the main flowering season by just two months. Their journals document the large number of new plant species that they collected and one wonders how much more they would have contained if the journey had been just a little bit earlier in the year!

The settlers favoured the western part of the plateau for their homesteads and farmyards because the large flat sandstone areas provided well-drained surfaces in the wet winters when the remaining countryside was too soggy for wagons and livestock. An added attraction was the convenient line of reliable springs surfacing at the edge of the sandstone that provided water in the dry summer months. The sandstone was also a good material for building and some of the farm buildings made from sandstone blocks are still proudly standing after more than 200 years. When the town of Nieuwoudtville was founded in 1897, on land that was purchased from H.C. Nieuwoudt after whom the town is named, the fine old buildings were fashioned from the same local rock. Pieter Bründyn and his family are thought to have been the town's principal stone masons at the time.

The Boer War broke out in 1899 and there is evidence of skirmishes throughout the region. Local residents have colourful stories of the war passed down from their forefathers. In more recent times Nieuwoudtville has become a 'Mecca' for botanists and flower lovers from around the world, and visitors' books boast an impressive number of pilgrims from far and wide.

Buildings

The beautifully built Neo Gothic style Dutch Reformed Church in Nieuwoudtville is one of the few remaining early dressed sandstone churches in the country. The foundation stone was laid in 1906 and the church is now a national monument. Other noteworthy

buildings in the town are the 'pastorie' (rectory), the post office and shop next door to it, the school, and numerous stone homes. On farms in the area there are ruins of early homesteads built of stone and clay, which were originally thatched with local species of restios ('dekriet'). Some of these homesteads have been restored and are still in use, like the roadside stall at Matjesfontein.

The 'trekpad'

In the Nieuwoudtville area most of the farms consist of widely separated portions of land. In order for farmers to move their livestock between sections of their farms and to take advantage of summer and winter grazing it was necessary for them to move across neighbours' farms. Before fencing of farms became widespread, a system of paths was laid out where trekkers could move with their stock. These paths were demarcated by beacons. It was an unwritten law that the farmer whose property was being traversed would supply water for the stock on the understanding that the same hospitality would be granted him when he needed it. These transhumance paths were known as 'trekpaaië' (singular = **trekpad**) and portions of them are still in operation today. The stock drivers were supposed to confine their animals within the demarcated area, but the oral history of the area abounds with stories of scoundrels who allowed their stock to graze illegally on neighbours' farms while trekking across them.

NIEUWOUDTVILLE UNDERGROUND

Nieuwoudtville is renowned for its high number of bulbous plants. The variety of flowers is immediately obvious, but there is an equally amazing diversity of below ground structures. Plants that can store reserves underground, where they won't dry out, and that have a dormant period during the hottest months when they don't have leaves or stems above ground, are well suited to survive the summer droughts that occur in Nieuwoudtville. Botanists refer to these plants as **geophytes** and the below ground structures may be classified as bulbs, corms, rhizomes, or tubers.

In some areas around Nieuwoudtville there may be as many as 25 000 geophytes per square metre, but it is more usual to find a few hundred plants. At this density, a spade-full of soil will contain more than 100 bulbs and corms.

Part of the reason for this abundance seems to be the different ways in which these plants survive the combined effects of drying out and being eaten. An underground bulb or corm may escape the hot sun but it also provides a potential meal for porcupines and mole rats. A single porcupine could eat several hundred bulbs a night so surviving being eaten can be as important as escaping desiccation.

Some geophytes have shallow bulbs with low nutritional value and a high water content. Some of these bulbs may reach the size of a football (e.g. *Boophone*). Others have small corms or bulbs that are buried deep in the soil (e.g. *Wurmbea*), reaching into the rocky layer where they are well protected. Still others are designed to break up when they are disturbed, so the primary bulb or corm is surrounded by numerous bulbils or cormlets. There are also some species that occur only among rocks where they are less likely to be uprooted by porcupines (e.g. *Babiana framesii* in the dolerite koppies). High densities of geophytes are found where the different types occur together or where porcupines constantly dig over the soil resulting in high numbers of those species with bulbils and cormlets.

What's up with all this digging?

Walking around the veld in Nieuwoudtville, you will notice many porcupine diggings. These prickly creatures of the night eat a range of geophyte species, even some known to be poisonous to livestock and humans. For example, they relish chinchinchees (*Ornithogalum conicum*) and tulp (*Moraea bifida*). Although their activities appear to be destructive, porcupines play an important role in the ecosystem. Many geophytes reproduce vegetatively by cormlets or bulbils and may actually benefit from the foraging activities of porcupines. Furthermore, their digging sites may favour plant germination and establishment. Research has shown that more plant seedlings grow in these digging sites. So, although porcupines are often seen as pests because of the damage they cause to water pipes (they gnaw on plastic pipes) and fences, the positive effects they have on the natural vegetation should not be overlooked.

SOILS

The diversity of flowers in Nieuwoudtville is partly explained by the variety of soils. There are five bands of different soils that run parallel to the escarpment (roughly north to south) and the short journey from the top of Vanrhyn's Pass to a few kilometres past Nieuwoudtville will take you across all the major soil types. At the top of the pass, the soils are derived from Table Mountain Sandstone and these acidic and nutrient poor soils support fynbos vegetation. Although these soils are not generally good for agriculture, they are suitable for the cultivation of rooibos tea, which is a fynbos plant. A few kilometres east of the escarpment, the sandstone gives way to tillite soils that are derived from Dwyka sediments. The Dwyka rocks were formed when a massive glacier covered the whole Karoo area about 300 million years ago. These soils, known locally as 'vaalgrond' have a yellow or grey colour, which is due to chemical changes that occur when the soils become waterlogged during winter. The '**vaalgrond**' has a high clay content and may form crusts when clay particles move to the surface. Overgrazing and excessive cultivation can promote crust formation and result in greater erosion. The natural vegetation on these soils is known as renosterveld, but very little remains because most of the land has been ploughed for wheat cultivation.

Some of the most interesting soils in South Africa can be seen just east of Nieuwoudtville. The soils are derived from a Karoo dolerite sill, which gave rise to the north-south row of koppies (small rocky hills). The soils are known locally as 'rooigrond' (red soil) due to the high iron content, which rusts to give a deep red colour. The '**rooigrond**' has a remarkable capacity to shrink and swell during alternate dry and wet periods, giving rise to massive cracks in the soil. The cracks result in a self-mulching process in which topsoil falls into the cracks and subsoil moves to the surface. These soils are called vertisols. They are very fertile but cultivation depletes the soil nutrients. A completely different suite of plants grows on these soils, including many of the Nieuwoudtville endemics.

Beyond the dolerite koppies, the soils are also derived from dolerite, but they have a sandy texture and do not form the deep vertisols found on the west side of koppies. These soils eventually give way to tillite and then soils derived from Ecca Shales, which cover a large proportion of the Karoo.

DOLERITE KOPPIES

The north-south row of dolerite koppies to the east of Nieuwoudtville are the remains of a dolerite sill. **Dolerite sills** and **dykes** are intrusions of igneous rock formed by molten

magma from the Earth's mantle that forced its way to the surface through cracks in the rock layers. Cracks may form when there is tension in the Earth's surface, e.g. the break-up of Gondwanaland. Dykes are vertical (or nearly vertical) intrusions of magma cutting across sedimentary layers. Sills form when the magma is able to force itself between sedimentary layers. In other words they are parallel to the layers. The dolerite is more resistant to weathering and erosion than the surrounding sedimentary rocks so the dolerite stands out from the surrounding landscape as a row of **koppies**. The large boulders that are typical of these koppies were formed when the magma cooled relatively quickly forming cracks and columns of rock. With time, weathering has produced the spectacular balancing rocks so evident in the koppies.

GLACIAL PAVEMENT

Evidence of the extensive sheet glacier that covered much of South Africa about 300 million years ago can be seen south of Nieuwoudtville where grooves formed by rocks and pebbles carried in the ice sheet were left behind on the glacial floor after the ice sheet melted. These glacial pavements tend to impede water infiltration and damp patches result, which are favourite habitats for some of the lovely local geophytic plants.

LANDUSE

Today sheep and wheat farming are the most important economic activities in the area, but rooibos tea is farmed on the sandstone soils and is famous for its fine quality. A small amount of seed potato production, and ecotourism, are now also regarded as alternative or complementary forms of landuse. As in all farming areas, landuse has influenced the abundance of natural biodiversity remaining in the area and many of the farmers have tried different approaches to preserve the natural biodiversity on their farms, including a shift away from wheat farming and experimenting with organic farming. The Conservation Farming Project, co-ordinated by the National Botanical Institute, has been looking at the conservation benefits of different farming practices. Landuse of all kinds changes the disturbance regimes in an ecosystem and influences the functioning of the ecosystem. For example, ploughing changes the natural soil structure which affects the distribution and persistence of natural species, and sheep passing through an area affects water penetration into the soil and seed dispersal – their hooves compact the soil, and seeds are either eaten and/or transported to other areas. Even the footprints of tourists affect the natural functioning of ecosystems!

The people of Nieuwoudtville have long valued their natural environment and the Nieuwoudtville Wild Flower Reserve was created to conserve some of the spectacular and unique local plants. The reserves at the Nieuwoudtville waterfall and Oorlogskloof also protect unique features of the environment. Visitors wanting a memento from the 'Bulb Capital of the World' can purchase local bulbs from the Nieuwoudtville bulb nursery.

GUIDE TO FLOWER SPOTTING

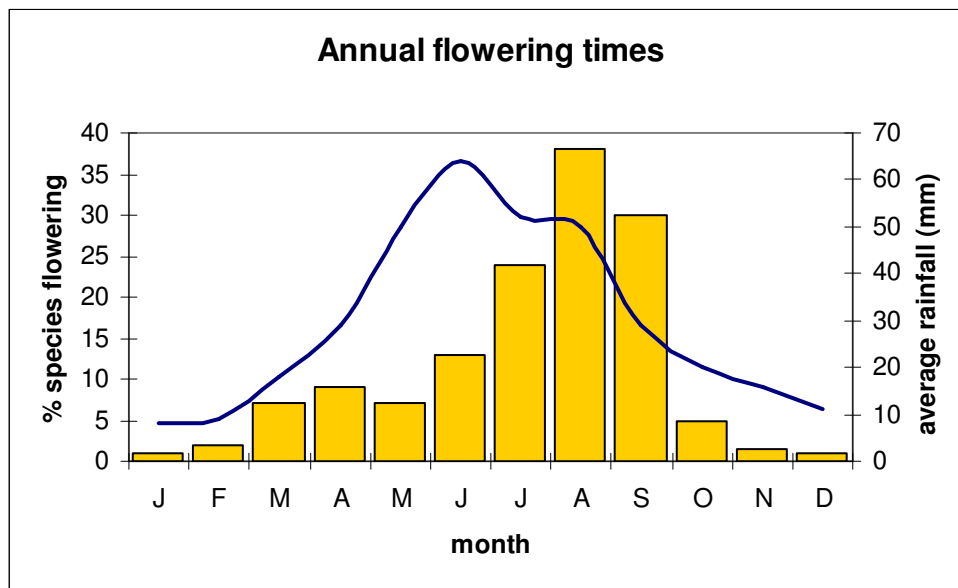
There are two 'flower spotting' seasons during the year at Nieuwoudtville. Most of the species flower during the spring (starting in about mid-August) but there are some very conspicuous plants that flower in autumn. If there has been a shower of rain at the end of summer the spectacular autumn displays of the candelabra-like *Brunsvigia bosmaniae* carpet the koppies in pink. A sunset amongst the brunsvigias is an experience of a lifetime and a rising full moon is an added delight as the blooms appear to glow in the twilight. The spring flowering species also rely on enough rain to stimulate flowering but

it is seldom that there are no flowers in spring. 'Flower spotting' is a leisurely activity, as most flowers open only when the air temperature has warmed up – usually about ten in the morning. Midday is prime time for many flowers, although the evening flowers only open later in the afternoon. Flowers tend to face the sun, so the best displays of open blooms and vivid colours are seen when travelling with one's back to the sun. Some easily accessible flower 'hotspots' are the Nieuwoudtville Wild Flower Reserve, Oorlogskloof Nature Reserve, the 'trekpad', Biekoes, Glenlyon, Matjesfontein, the Glacial Pavement, the Nieuwoudtville waterfall, the Kokerboom forest, and right in town, the Nieuwoudtville Dutch Reformed Church yard has its own special display. A rewarding alternative route to or from Nieuwoudtville is via the Botterkloof Pass dirt road, which offers a display of flowers to complement the exciting scenery.

The Nieuwoudtville Wild Flower Guide published by the Botanical Society is a very useful companion for flower spotters.

Please remember to respect the custodians of these floral treasures and:

- ❖ obtain access permission when necessary (see map, Publicity Association has details)
- ❖ leave all gates as you found them & stay on the roads
- ❖ take only photos
- ❖ avoid treading on the flowers, and never pick them
- ❖ enjoy the birds/tortoises/insects . . . but avoid disturbing them
- ❖ respect other visitors
- ❖ take away your litter



THREATENED PLANTS CONSERVING A 'HOTSPOT'

Conservation biologists refer to parts of the world that have high numbers of plant and animal species, combined with high levels of threat, as conservation 'hotspots'.

Nieuwoudtville is a classic example of a hotspot with a high number of species, many species that occur only in this area (**endemics** [!]) and a large number of threatened

species [*]. About 1 350 plants are known to occur on the Bokkeveld Plateau and more than 600 of these are found in the vicinity of Nieuwoudtville. Twenty two plant species occur only around Nieuwoudtville (**Nieuwoudtville endemics**) and 28 other plant species from the region occur only on the Bokkeveld Plateau (**Bokkeveld endemics**). These plants occur nowhere else so if they die out here, they are gone forever.

The problem around Nieuwoudtville is that many of the unusual plants occur in naturally small areas, often associated with particular soils. Some of these soils are also good for agriculture, especially the tillite soils that support renosterveld vegetation. Only 21% of the original renosterveld vegetation is left and this amounts to about 10 km². Although agriculture has had less impact on other vegetation types, the areas that are left are still very small. Some special habitats, such as damp areas where tillite and sandstone soils merge (e.g. at Biekoes and Matjesfontein), have almost disappeared. As a result, Nieuwoudtville has a high number of threatened species. According to the World Conservation Union (IUCN) Red List, 88 plant species from the area are classified as threatened and a further 23 species as possibly threatened (unknown). Forty species of threatened plants occur on the tillite and dolerite soils most affected by agriculture. The rest occur in the fynbos to the west or the succulent karoo to the east.

Most of Nieuwoudtville's special plants occur on farmland. The challenge for conservation around Nieuwoudtville is to find forms of productive land use that have a low impact on the natural diversity. It is essential to conserve what is left by not ploughing up the remaining bits of natural vegetation and by ensuring that natural vegetation is managed in a way that conserves the wild plants and animals. Scientific studies show that although some bits of renosterveld have more species than others, almost all the patches that remain have one or more unusual species in them. If these bits of vegetation are destroyed or are not properly managed, Nieuwoudtville will lose some of its special plants.

There are no magic solutions for conservation on farmland. One of the findings of the Conservation Farming Project was that farmers are continuously experimenting with different management options and implementing a form of adaptive management. Decisions about land use are based on the farmer's needs and the information they have available on their environment, different production options, and the needs of their community.

NIEUWOUDTVILLE'S SPECIAL PLANTS

Species found only near Nieuwoudtville (! Nieuwoudtville endemics)

Arctotheca marginata

Babiana vanzylliae

Berkheya glabrata

Bulbinella latifolia subsp. *doleritica*

Clivia mirabilis

Cyanella aquatica

Daubenya capensis

Daubenya stylosa

Diascia lewisiae

Drimia involuta

Emelia hantamensis

Geissorhiza splendidissima

Geissorhiza subrigida
Geissorhiza sulphurascens
Gladiolus mostertiae
Lachenalia alba
Moraea spiralis
Moraea vallisbelli
Moraea verecunda
Moraea vespertina
Prionanthium dentatum
Romulea sabulosa
Romulea sanguinalis
Sparaxis elegans
Sparaxis tricolor
Staavia phyllicoides
Trachyandra prolifera
Xiphotheca canescens
Zantedeschia odorata

Bokkeveld species with good populations around Nieuwoudtville (! Bokkeveld endemics)

Babiana flabellifolia
Babiana spathacea
Bulbinella eburniflora
Corycium ingeanum
Cromidon varicalyx
Diascia cardiosepala
Diascia insignis
Geissorhiza inaequalis
Gladiolus sufflavus
Gnidia leipoldtii
Heliophila collina
Hesperantha rivulicola
Hesperantha vaginata
Ixia brunneobracteata
Lachenalia neilii
Lapeirousia oreogena
Leucadendron remotum
Moraea pseudospicata
Moraea odorata
Romulea amoena
Romulea monadelphica
Sparaxis pillansii
Strumaria picta
Sutera longipedicellata

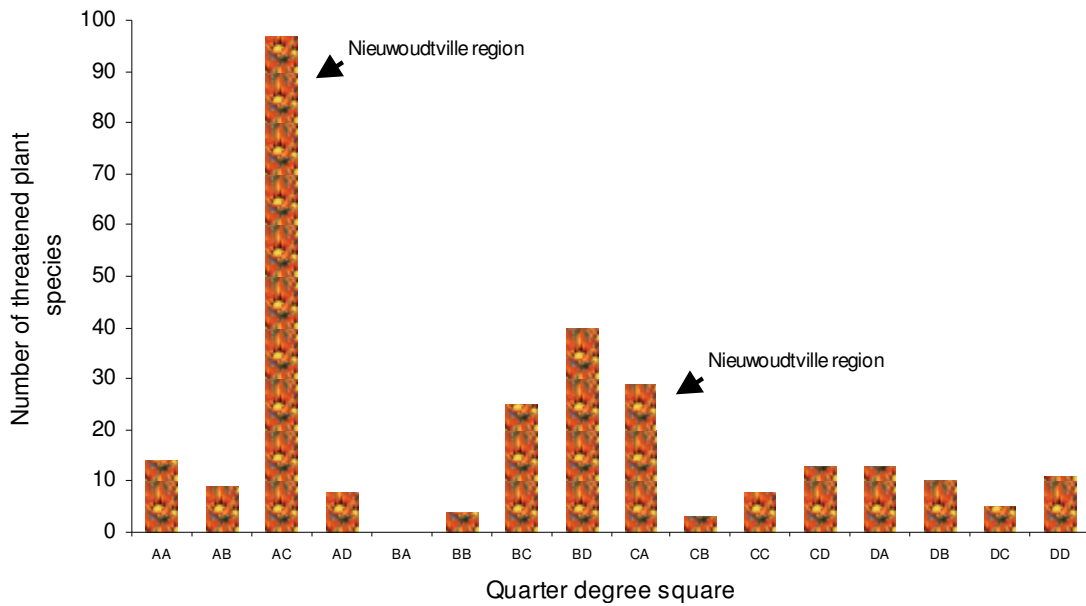
Other threatened species (*) that occur around Nieuwoudtville

Adenandra marginata
Aloe krapohlina
Anacampseros comptonii
Anisodontea racemosa
Arctotis diffusa
Aspalathus florulenta

Chamarea snijmaniae
Chenopodiopsis chenopodioides
Cliffortia acutifolia
Crassula pellucida
Cullumia pectinata
Disperis bolusiana
Drimia multifolia
Eriospermum erinum,
Eriospermum exigium
Eriospermum glaciale
Eriospermum subtile
Euryops mirus
Euryops virgatus
Geissorhiza arenicola
Haemanthus amarylloides
Hessea pulcherrima
Ixia curvata
Lachenalia macgregoriorum
Lachenalia dasybotrya
Lotononis carnea
Moraea hesperantha
Ornithogalum pilosum
Otholobium flexuosum
Othonna cacalioides
Othonna pygmaea
Othonna rechingeri
Oxalis melanosticta var. *latifolia*
Pelargonium punctatum
Phylica affinis
Phylica agathosmoides
Phylica pustulata
Phyllobolus caudatus
Romulea monticola
Romulea multisulcata
Romulea toximontana
Romulea viridibracteata
Serruria millefolia
Strumaria discifera
Trachyandra gracilentia
Zaluzianskya acrobareia

Vegetation Type	Not ploughed		Local conservation status
	Area (km ²)	%	
Nieuwoudtville shale renosterveld	10,0	21	critically endangered
Nieuwoudtville Karoo-renosterveld transition	8,8	42	endangered
Nieuwoudtville-Roggeveld dolerite renosterveld	31,0	85	least threatened
Nieuwoudtville dolerite koppie renosterveld	6,9	100	least threatened

Map reference 31° S 19° E for the Bokkeveld Plateau



POLLINATION

With its high diversity of flowers, Nieuwoudtville is also a remarkable place to observe pollinators. There are many species of bees, flies, beetles, moths, and butterflies, as well as birds (especially sunbirds) and rodents that are involved in pollination. Many of the fascinating interactions that make the fynbos and succulent karoo regions so unique are found in the Nieuwoudtville area.

Long-tongued flies are a special feature of the pollination systems in fynbos and renosterveld vegetation where butterflies are often quite scarce. They are associated with flowers that have long corolla tubes such as *Babiana*, *Gladiolus*, and *Lapeirousia* and tongue length can vary from a modest 1 cm to over 8 cm. The south-western part of South Africa is particularly rich in species of long tongued flies belonging either to the horse-fly family (Tabanidae) or the family of tangle-winged flies (Nemestrinidae) and they are fascinating insects to observe. The flies around Nieuwoudtville are mostly tangle-winged flies, with large grey-brown bodies and long tongues (rostrums) that hang down below their heads (in horse-flies the tongue projects forwards). They can be seen hovering around patches of suitable flowers in the 'trekpad' (watch out for them on *Babiana vanzyliae* and *Lapeirousia jacquinii*), and in the dolerite koppies on the Wild Flower Reserve and Glenlyon (look for them on *Lapeirousia oreogena* and *Babiana framesii*). Very little is known about the biology of these important pollinators except that related species of fly in North America are parasitic on grasshoppers.

Oil collecting bees are also interesting pollinators to look out for. Most plants provide bees with a reward of nectar or pollen, but some species provide bees with oil as a reward. The oil glands are usually found in spurs protruding from the back of the flower, giving rise to the Afrikaans common name of 'horinkies' (little horns) for oil producing species of *Diascia*. Oil-collecting bees have long, hairy front legs that they can insert into the spurs to get the oil. The oil collecting bees (*Rediviva*) are quite rare but look out for them on members of the snapdragon family (*Diascia* and *Hemimeris*) or on moederkappie orchids (*Pterygodium*).

Monkey beetles are another group of pollinating insects that are found mostly in the south-western part of South Africa. These robust beetles, with large hind legs, are usually found in open flowers such as daisies, romuleas, and chinchinchees (*Ornithogalum*). They were originally thought to be messy generalist pollinators but recent research has shown that they can have quite specific pollinator interactions. The beetle larvae live in the soil and scientists have shown that these beetles are associated with specific types of soil. This means that beetles associated with shale soils won't pollinate flowers that grow on dolerite soils and vice versa. Even flowers that look almost identical, such as *Romulea sabulosa* (tillite soil) and *Romulea monadelphica* (dolerite soils), have different beetle pollinators because they grow in different soils.

In addition to honeybees, which live together in colonies or hives, there is a rich variety of solitary bees. Solitary bees make nests either in the stalks or stems of plants, in sandy soils, or in mudbanks. As a result, they often need special features in the landscape in order to survive, and stream banks, old burrows, termite mounds, erosion gullies, or plants with pithy stems (e.g. Aloe flower heads) are particularly important. One of the large and prominent bees in the Nieuwoudtville area nests in old termite mounds and they make impressive 2 cm tall turrets at the nest entrance (these can be seen along the 'trekpad' and at Glenlyon during September and October). Other species nest in 'bee villages' where hundreds of bees build their nests together in mudbanks (look out for them in erosion gullies).

Some pollinator interactions are best observed after sundown. When the March flowers (*Brunsvigia*) are blooming in March/April, the stillness just before dark is punctuated by the rapid flurry of wings as hawkmoths flit between flowers. More clumsy noctuid moths can also be seen at the same time. Some plants (such as *Massonia echinata* and *Daubenyia capensis*) have their flowers close to the ground where their musty scent will attract mice and other rodents.

Bird pollinators are attracted to brightly coloured red or orange flowers. The birds are usually rewarded with copious amounts of dilute nectar in exchange for the responsibility of pollination. The bright yellow flowers and conspicuous reddish stamens of the kokerboom (*Aloe dichotoma*) provide a feast for malachite sunbirds. On warm days in the flowering season (winter to early spring) the kokerboom forest is simply teeming with excited little birds. Look out for bird pollinators on the brightly coloured flowers of *Veltheimia*, *Kniphofia*, *Lessertia* (= *Sutherlandia*), *Microlooma* and *Melianthus*.

ANIMALS AT NIEUWOUDTVILLE

The variety of habitats around Nieuwoudtville has resulted in a great diversity of small to medium sized animals. Amongst the smallest are the insects, which are always abundant but are never well known. Sixty-three species of ant and nearly 200 species of bees and wasps have been recorded from the area. The harvester ant is one of the more conspicuous insects and can be seen gathering seeds and carting them off to the nest along well worn foraging paths. Ants may also have more subtle interactions such as their relationships with lycaenid butterflies in which the butterfly larvae are carried into ant nests and tended by worker ants. One such butterfly, *Lepidochrysops mcgregori*, was described from the farm Glenlyon, south of Nieuwoudtville, in 1968.

About 44 species of reptile occur within the Nieuwoudtville area. Rocky parts of the landscape, such as the sandstone, dolerite koppies, and karoo are important habitats for the 24 lizards, 16 snakes and four tortoises that occur here. Renosterveld is generally poor in reptiles due to the absence of rocks and to dense shrub cover. Cultivated lands are also not good for reptiles as the rocks that provide shelter are usually removed during clearing. During surveys of reptiles in the region, only three species (angulate tortoise, karoo sand snake, and spotted sand lizard) were found in renosterveld and none were found in areas that had been cultivated.

Birds are always an interesting feature of natural and farm environments. The veld around Nieuwoudtville would be strangely quiet without the clapping and whistling call of the Clapper Lark or the noisy call of the Black Korhaan. About 200 species of bird are thought to occur in the vicinity. Among them are threatened species such as Blue Crane, Lesser Kestrel, Ludwig's Bustard, and Martial Eagle and near threatened species like Black Harrier. Ironically, the Blue Crane does relatively well in wheat growing areas and is most likely to be seen in agricultural lands. Other birds such as Helmeted Guinea Fowl and francolin seem to have declined in intensively farmed areas due to less suitable habitat as well as a possible increase in the abundance of small predators such as mongoose and striped polecat.

The aardvark is probably the largest mammal in the area and their diggings for ants and termites leave large holes that are easily seen. Other mammals with a very obvious presence are porcupines, common molerats (their molehills can be seen on the tillite soils), and hairy-footed gerbils that live in colonies with numerous entrance holes. Leopards roam the mountain areas along the escarpment and other mammals in the

area include caracal, black-backed jackal, Cape fox, bat-eared fox, Cape clawless otter, striped polecat, baboon, steenbok, and klipspringer. Many species still rely on farmland for their survival, but the Oorlogskloof Nature Reserve is an important refuge in the area. The unusual fauna of the reserve contains species that are not typically associated with fynbos vegetation and this is due to the presence of other vegetation types in the surrounding farmland.

Nieuwoudtville Publicity Association
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