

# Living diamonds — the Sperrgebiet's natural riches

*After eight years of botanical and environmental work in the enigmatic Diamond Area No 1 – the Sperrgebiet – Antje Burke of the Southern Namib Restoration Ecology Project: Namibian National Biodiversity Programme, Ministry of Environment and Tourism, gives an account of the area's natural riches.*

**D**iamonds, grandiose landscapes and succulents that come in all forms, sizes, shapes and colours come to mind when I think of the Sperrgebiet. Locked up for nearly a century to public access, the Sperrgebiet of today is one of Namibia's last true wilderness areas and a natural asset of as yet unappreciated value. This little stretch of miner's and botanical paradise covers barely 3% of Namibia's land surface, but is already an essential contributor to Namibia's economy. However, its long-term potential to contribute to sustainable development still needs to be unlocked.

While most people know about the diamond and other mining industries in this area – with Skorpion Mine having just come on line – few know about the Sperrgebiet's natural riches. A diversity of contrasting landscapes provides the natural backdrop for plant and animal life. Seemingly never-ending expanses of dune fields – some moving and devoid of plant cover, some sparsely vegetated with strange, bonsai-like, low stem succulents and the sand moving little, if at all – are abruptly brought to a halt by impressive humps of rocks, the so-called insel-

bergs (German for isolated or 'island' mountain).

In between, there are vast stretches of gravel plains with different types of cover. Quartz is most common, but other reddish, brown and black stones of different shapes and sizes occur, depending on the closest rocky outcrops nearby that provide the material for these desert pavements. Near the coast, gypsum may underlie these gravel plains, indicated by the way one sinks in deeply when walking on them. Along the coast there is the conventional sequence of beaches, framed by fore-dunes (the first set of dunes adjoining a beach) and lower coastal dunes following inland. Massive, often several metres-high hummocks formed by the characteristic sand-accumulating shrub *Salsola nollothensis* (coastal ganna), smaller hummocks that form in the lee of and around dwarf shrubs and hardy grasses give these coastal areas their characteristics. Salt pans and rocky headlands disrupt these expansive stretches of nearly pristine beaches.

While these varied landscapes are obvious to most people travelling through the area, the diversity of physi-

cal environmental conditions does not stop here. Each of these landforms is associated with a range of different soil types, often changing within the space of a few tens of centimetres.

Before going on to the living components, it is prudent to set the scene in climatic terms. The Sperrgebiet is a section of the southern Namib Desert. Despite remarkable plant cover in some areas, rainfall ranges from only a 20-mm long-term annual average at Lüderitz to some 60 mm near Rosh Pinah at the eastern boundary of the Sperrgebiet. But, although the average is low, rain falls almost any time of the year.

This area is in the transition zone between winter and summer rainfall on the southern African continent. Rains are more spread over the year and more likely to happen at least once a year. Conditions in the Sperrgebiet in terms of receiving moisture are hence more benign than in other parts of the Namib Desert. Added to this is the influence of fog that brings life-sustaining moisture to almost the entire area, bar the very north-eastern corner. Another force that counteracts these conditions quite effectively is wind. Strong, almost continu-

ous, southerly winds have to be endured along the coastal areas, and their effect can be felt far inland. Hot, dusty easterly bergwinds, often racing down the escarpment in powerful gusts, prevail in winter.

So the plants and animals that live here had to adapt to these particular conditions. The development of the plant life especially shows tremendous diversity. To date some 1 050 plant species have been recorded in the Sperrgebiet. This is nearly a quarter of the entire plant diversity of this country, a remarkable concentration of plant riches on only 3% of Namibia's land surface. A good 17% of these plants occur in Namibia only, and many are restricted to the Sperrgebiet.

**One of only 25  
biodiversity hotspots  
in the world**

The Sperrgebiet is part of the Succulent Karoo Biome, a region classified by biologists as receiving winter rainfall, experiencing relatively moderate temperature fluctuations and characterised by the dominance of low succulent shrubs.

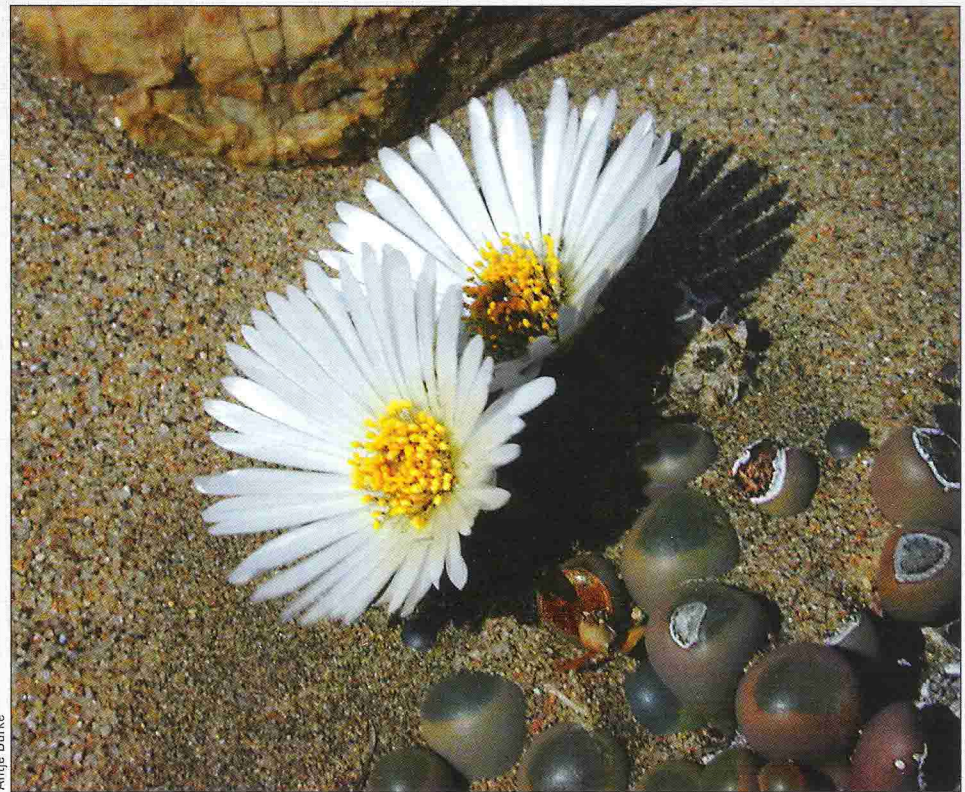


The region's remarkable diversity and the high level of endemism (plants and animals that are restricted to this biome) have resulted in the Succulent Karoo being nominated as a global biodiversity hotspot, of which there are only 25 on this planet. Being thus singled out amongst coastal and tropical rainforests and species-rich Pacific islands is quite remarkable for an arid region.

The Succulent Karoo's remarkable plant diversity is believed to be driven largely by recent (at least in geological terms) climatic fluctuations, the small-scale habitat diversity and specific features of the plants that have enabled them to adapt quickly and develop different solutions to common environmental problems. Climatic shift, e.g. during the ice ages, forced plants and animals to adapt to changes. Those that couldn't were simply 'weeded out', but those that did may have come up with several solutions instead of one and thus developed into different species.

The speed of speciation in a section of the main group of succulents found in this biome, the vygies (*Mesembryanthemaceae*), is setting a world record, as recently published in the top scientific journal *Nature*. Apart from the climatic fluctuations, small-scale changes in the substrate are believed to be compounding factors. These provide slightly different environmental conditions over a short distance and so enable plants to explore a different 'niche' and thus again to develop different species.

Some vygies also have features that favour speciation. One important trait is that their seeds are usually not dispersed very far from the parent plant, as they have



Anjie Burke

*The window plant, Fenestraria rhopalophylla, hides underground, with only the tip of the leaves appearing at the surface, resembling pebbles. This Sperrgebiet endemic is only noticed when in flower.*

no adaptations for long-range dispersal. This means that if a population of plants of the same species is broken apart by some environmental factor or another, e.g. a river channelling its way through the middle of the population, those plants are now divided into two populations. Because of short-range dispersal, seeds now no longer reach the other side. Assuming that this river would also separate the pollinators from the now divided populations, these could therefore develop into different species.

As yet these are suggestions scientists have come up with to explain this remarkable diversity; testing whether the notions are actually true is the next task. While some evidence from pollen, genetic and ecological studies is becoming available, these are pieces in a big puzzle. Many more plants need to be studied to complete the puzzle. To see whether these explanations also help to unravel the reasons for the remarkable plant diversity in the Sperrgebiet is the next great challenge for botanists and ecologists

working in the area. This may take many more years.

### Limited tourism to maintain sustainable development

In the meantime plans are on the cards for gradually opening up the area to let people appreciate the value of this natural asset. Yet there are many obstacles to such developments. Not only the Diamond Act that currently hinders all public access, but also fears in respect of environmental impacts associated with tourism in such a fragile wilderness area and threats posed by illegal collectors to some of the rarest of the succulents. This calls for carefully and well-thought-out plans to utilise this piece of desert in a manner that will not degrade its long-term natural value.

The mining industry has no doubt left and will still leave irrecoverable scars, but these are at present confined to localised areas and the remaining wilderness land-

scape should only be developed in a way that leaves no lasting impact. However, we must not forget that without the diamond riches and associated security restrictions, this wilderness area would not exist in its present form and would probably have been altered by livestock farming, with its succulent riches plundered by illegal collecting.

During the last few years several planning initiatives have been completed, first at a general level (Sperrgebiet Land Use Plan) and then in more detail (Sperrgebiet Conservation Planning Study). Although some intricate planning and administrative issues have yet to be resolved, thoughts from a wide range of stakeholders, scientists and conservation planners have been amalgamated in the current plans for conservation and development of a multi-use protected area that receives support from the people in Namibia as well as from abroad. If these are implemented, Namibia may be in a position to demonstrate to the world that conservation and mining do not always need to be at loggerheads. ■