

## Restoration of degraded thicket in the Eastern Cape: capturing carbon, enhancing biodiversity and providing employment

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**The degradation of thicket veld** The thicket vegetation of the south Eastern Cape is highly sensitive to overgrazing by livestock, especially by mohair-producing angoras. Heavy browsing by goats can convert dense shrubland into a desert-like system within ten years. Thicket exists in various forms, from low noorsveld to tall thicket with tree euphorbias and aloes. In the case of thicket rich in spekboom shrubs (igwanishe or *Portulacaria afra*), approx. 46% of the original 16 000 square km has undergone severe degradation, and 34% has been subjected to moderate disturbance by overgrazing.



Degradation in action



Restoration in action

### The challenge of restoration

Removal of livestock and resting the veld does not lead to natural recovery of the vegetation because of changes in the exposed soil, such as temperature extremes and reduced water-holding capacity. The active restoration of thousands of hectares of formerly healthy thicket, rich in spekboom plants, appears at first sight to be unfeasible. But there is now compelling scientific evidence that restoration using spekboom can be funded by the international carbon market. Such restoration would generate carbon credits and create jobs in economically depressed rural areas.

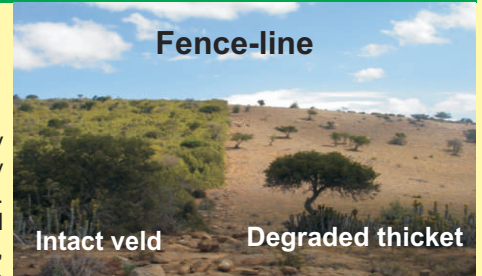
### The use of spekboom

Over the years, several land managers have used cuttings of spekboom to restore plant cover in degraded thicket. The plant's ability to sprout from replanted cuttings without irrigation or nursery time, makes it a very good candidate for large scale restoration of degraded land. Furthermore, there is sound scientific evidence that spekboom is a "super plant" when it comes to its extraordinary carbon storing capabilities. Data gathered over the last seven years show that carbon storage in intact spekboom thicket in the arid south Eastern Cape exceeds 20 kg carbon per square meter of vegetation, which is equivalent to that of moist subtropical forests.



Data on the remarkable rates of carbon storage under re-planted spekboom were collected on the farm Krompoort, between Uitenhage and Steytlerville. Over the last 30 years, the farmer, Mr Henry Graham Slater, has systematically restored a degraded hillslope using spekboom cuttings. Now the oldest spekboom plants stand more than 2m tall covering 90% of the planted site - an impressive growth from cuttings planted in bare ground under a rainfall of only 250-350 mm per year. The plantings enabled estimates of potential rates of carbon sequestration, with the oldest stand indicating an average rate of 0.42 kg of carbon per square meter per year. This rate of carbon sequestration is comparable to many temperate and subtropical forests, and is extraordinarily high for an arid environment.

Spekboom plants can withstand grazing by elephant and black rhino which feed from above the shrub, forming a "skirt" of branches which are able to root and proliferate on contact with the ground, while broken branches are able to re-establish, much like planted cuttings. But goats feed from underneath the plant, so that overgrazing soon destroys the umbrella-shaped canopy.



Fence-line

Intact veld

Degraded thicket

**The Subtropical Thicket Restoration Project** was initiated by the Department of Water Affairs & Forestry's (DWAf) Working for Woodlands programme with the aim of determining the logistical, practical and financial feasibility of restoring thicket at a farm scale (i.e. hundreds of hectares), the recovery of ecosystems and biodiversity, rates of carbon sequestration, and protocols for sourcing funding for restoration at a landscape scale (i.e. thousands of hectares). The project is funded by the Expanded Public Works Programme and implemented by the Gamtoos Irrigation Board.

To date, about 400 ha in the Baviaanskloof Nature Reserve (a World Heritage Site), the Addo Elephant National Park and the Great Fish River Reserve have been replanted. R3G has compiled a Project Design Document and is planning to generate carbon credits through the voluntary market from large-scale restoration achieved to date.

Furthermore, a landscape-wide trial of plots scattered over 800 km has been initiated to determine areas of optimal survivorship and best growth from cuttings of spekboom, as well as rates of carbon sequestration. Already 172 of the planned 300 plots have been set up.

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Regrowth after 27 yrs

The green-shaded area in this map was formerly covered in spekboom-rich thicket. Half of this area has been significantly degraded by overgrazing

