How no-man's-land is now everyone's problem

The renowned Cape flora is everywhere in retreat as runaway pine invasions transform the Outeniqua and Tsitsikamma mountains

by **Richard Cowling, Brian van Wilgen, Tineke Kraaij** and **Jonathan Britton**

Wildfires in invaded catchments are of extreme intensity and pose a huge threat to plantation forestry, agriculture and human settlements. Photo: B. van Wilgen.

Successful land management depends in part on good planning. Planners often use brief descriptions of possible futures (termed scenarios) to help people to visualize the longer-term consequences of the actions they take (or fail to take) today. Our tale is of a rather sobering scenario that we feel should be urgently and seriously considered by those planning for the Garden Route's future. It envisages a future in which residents and tourists alike are subject to severe and chronic water rationing as a result of a failure of mountain catchments to deliver ample, clean water as they do today. In this possible future, fires would rage with abnormal intensity, seriously threatening homes, crops, plantations and people. The high-intensity fires would damage the soil, resulting in erosion and silting up of dams, further exacerbating water problems. Tourist numbers would dwindle, both because of the dire water situation and because the unique and attractive fynbos that characterizes the region's many hiking trails would have largely disappeared under invasive alien pines. Economic activity would flounder and poverty would increase. Such a scenario now seems a strong possibility rather than an unlikely and distant outcome, simply because society has failed to plan for, and to deal with, the threat of invasive alien plants. How could such a situation have arisen? Let us explain.

Management history

When the PW Botha government restructured the Department of Water Affairs and Forestry (DWAF) in the mid 1980s, it probably didn't anticipate the dire consequences for the future of the Garden Route. The restructuring aimed to separate plantation forestry (a commercial undertaking, earmarked for privatization), catchment and indigenous forest management (conservation undertakings) and research (an undertaking that generates understanding and scenarios). The restructuring divided the land into plantations (which went first to SAFCOL and later Mountain To Ocean Forestry), nature reserves (where certain areas that had not been afforested with pines were devolved to the provincial nature conservation agencies), indigenous forests (which remained under the jurisdiction of DWAF) and research (which went to the CSIR, with a focus on different challenges). In the process though, large tracts of unafforested fynbos in the Outeniqua and Tsitsikamma mountains of the Garden Route areas were left without a custodian – the so-called 'no-man's-land'.

Prior to the restructuring, DWAF had done a great job in achieving the cardinal principles of catchment management: protect nature and maintain sustainable water delivery by applying appropriate fire and alien plant control regimes. Following restructuring, large tracts of fynbos-clad mountain catchment were transferred to Cape Nature Conservation (now CapeNature). However, the plantation arm of DWAF retained responsibility for almost all of the proclaimed catchment areas in the eastern Outeniqua and Tstisikamma mountains, but precious little was done to manage these areas. When SAFCOL was established in 1993 with its strict focus on growing trees for profit, they inherited these areas. The neglect continued; the costly burden of catchment management, which yields no immediate return on investment, was not its primary mandate.

As a result of these changes, the management of the eastern Outeniqua and Tsitsikamma mountain catchments languished for almost 20 years. Only recently has the management of this 'no-man's-land' been assumed by conservation authorities. At the time of writing, new-generation conservation areas are being planned for the region. South African National Parks has been given the challenge of forming the Garden Route National Park, a 120 000 ha tract of land that includes over 50 000 ha of neglected 'no-mans-land'. In addition, the Eastern Cape Parks Board adopted a large tract in the east (to form the Formosa Nature Reserve). The neglected areas have become infested with alien plants, mainly hakea and pine, the latter almost exclusively sourced from the adjacent pine plantations, some of which were located deep in the catchments on marginal, fire-exposed sites. Many of these marginal plantations have proved unprofitable, and will be handed over for rehabilitation, without provision of adequate funding for effective management, to cash-strapped conservation authorities.

How bad is the alien plant situation in these mountains? In November 2008, we undertook an aerial reconnaissance of the region and were

horrified to witness the extent of the problem. Large areas of mountain landscape have been transformed to closed-canopy pine forests, while much of the remaining area is well on its way to getting there. Indeed, there is hardly a hectare that is not invaded to some extent. While much of this invasion is in remote areas, equal evidence of the problem can be seen from the main roads that traverse the area. To ecologists, the problem is conspicuous and obvious – but most people are not ecologists, and they simply fail to notice this pervasive and growing blight.

Consequences of further neglect

Without effective management, the situation will rapidly worsen. With each fire – and fire is inevitable in fynbos landscapes – pine cones open and release winged seeds which can travel for kilometers. Thus, pine populations get denser and spread further after each fire. Based on research from the Outeniquas and other high-rainfall fynbos catchments, we predict that within two to three more fire cycles (i.e. the next 30 to 40 years), most fynbos in the Outeniquas and Tsitsikammas will disappear under pines.

The consequences of no effective management of the invasion of the Garden Route's mountain catchments for nature and for humans are, to put it bluntly, downright scary. First, because pines use up much more groundwater than fynbos, water yields could drop by between 30 and 100%, depending on annual rainfall. In drier areas, they use all the water; in wetter areas, some survive as stream flow. This could result in serious water rationing in Garden Route towns that depend upon these catchments for their water supplies. We use the term rationing (rather than restrictions) deliberately. What we are facing is not merely the nuisance of not being able to water your garden or wash your car – it is systematic rationing, comparable to electricity 'load-shedding' for existing residents, and an inability to provide water for any new development. The implications for the Garden Route – an area with a rapidly growing human population and footprint – are alarming.

Secondly, pine-infested areas carry a much higher fuel load than fynbos and support fires of much greater intensity; consequently, inevitable wildfires pose a greater threat to humans and their infrastructure. Notably threatened are commercial pine plantations. Indeed, since the Outeniqua-Tsitsikamma catchments reverted to no-mans-land in the 1980s, there has been an increase in wildfires originating in these areas, and these have had a devastating impact on the forestry industry. Moreover, these hot fires are no friend of the soil. While the mountain soils easily withstand normal fynbos fires, the fires in pine infestations damage the soils and result in severe erosion; microbes, creatures and seeds are incinerated, leaving bare and blackened surfaces that rapidly erode, clogging up rivers, dams and water treatment facilities.

Thirdly, pine invasions are bad news for wild nature. The dense and tall canopy suppresses populations of light-loving fynbos plants and animals. The scrappy, pine-invaded landscapes offer little for tourists. The famed Outeniqua and Tsitsikamma trails now traverse much terrain made gloomy and dull by towering pines and their fire-blackened skeletons. The renowned Cape flora is everywhere in retreat.

Such is the sad story of how no-man's-land has become everybody's problem. Ultimately, it is the services that these mountain ecosystems supply to humans – clean water to drink, irrigation water for agriculture, soil moisture for forestry trees, and beautiful scenery and nature for tourists – that are being compromised by pine invasions. Indeed, we believe that we are not being alarmist by saying that the sustainability of human enterprise in the Garden Route is at risk.

Finding a solution

So what needs to be done? Firstly, government officials, politicians and ordinary folk in the Garden Route need to be made aware of this problem and its implications for the region's economic development (this article is a contribution to this thrust). Secondly, the ecological-economic case for clearing pines and maintaining healthy catchments needs to be

Pine invasions in the eastern Outeniqua mountains. Dense stands abound and almost everywhere is invaded to some extent. Photo: R.M. Cowling.

A view on the Outeniqua Trail. Hikers would be forgiven for imagining they were in Europe or North America and not in the famed Cape Floral Kingdom. Photo: T. Kraaij.

made by scientists in a way that involves and empowers stakeholders. Thirdly, strategies for solving this problem need to be identified. Short-term strategies are obvious: prioritize and initiate clearing of pines and ensure that pine-free areas are maintained as such; and institute a scheme whereby users pay for the ecosystem services that the catchments deliver, for example water and tourism levies. In the longer term, attention will need to be given to the management of the source of the problem – the pine plantations. It may be prudent to phase out pine plantation forestry altogether in areas deep within the catchments and to prohibit re-afforestation in other areas until biological control of pines is implemented and/or sterile varieties are developed. Research on biological control was suspended due to fears about negative impacts on pine plantations, without weighing this up properly with the potential positive impacts. Finally, the will and means to tackle this problem must become 'mainstreamed' into the policies and practices of organizations (conservation authorities, municipalities, forestry companies, agriculture and tourism institutions and other non-governmental organizations) throughout the Garden Route.

Who will initiate the long and complex process required to restore to a healthy state the life-giving mountain catchments of the Garden Route? We believe that the Garden Route Initiative, GRI (see www.gri.org.za), which is a programme in the Cape Action for People and the Environment fold (http://www.capeaction.org.za), is in the best position to do this. The GRI is an institution that has the credibility, representation and leverage to kick-start this process. But everyone has a role to play, especially municipal officials and councilors. It's time to get those mountains working for, and not against, us. Pine invasions escalate exponentially, so any further delay will cost us more dearly.

THE AUTHORS

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ABOVE: What we need to achieve: restored fynbos at Soetkraal, a contractual national park in the Tstitsikamma mountains. Alien plant control in this area was initiated in 1995 as a pilot project of DWAF's Working for Water programme. Some R30-million has been spent, a small amount when compared to the long-term benefits for the Garden Route. Photo: Y. van Wijk.