

# A landscape/risk management approach to mitigate against veld fires

By Malcolm Procter



*The first step that must be taken in any effective risk management effort is the identification and profiling of hazards*

When disaster risk is not factored into development decisions, households and farming communities become vulnerable to external threats, including weather extremes. As veld fires cause harm and damage to people, property, infrastructure, economies and the environment, the goals of sustainable development are put to jeopardy. Disaster recovery and rehabilitation efforts require enormous funds that, amidst insufficient contingency funds, are taken out from other development programmes that are planned or underway, thereby impeding development efforts.

The current planning process does not typically consider who either causes the risk or exacerbates the risk across these vast fire-prone areas or even if owners are likely or even able to reduce fuels and thus risk. Therefore, it is important that veld fire mitigation programmes are made an integral part of the developmental programme.

Landowners living in areas that are prone to veld fires face three options

when it comes to mitigating against veld fires. They can:

- Solve it
- Live with it
- Minimise it

### **Solving it is not possible**

The many incidents of fire show that attempts to control burning through laws designed to prevent uncontrolled use of fire, have failed. Others have noted that one of the consequences of fire suppression policies is an increased risk of fierce fires due to accumulation of fuel loads.

Appealing as the idea may be, there is no 'one size fits all' solution. Given that fire behaviour and resulting severity result from the combination of weather, available fuels and physical setting, the design of site-specific solutions will be highly variable. This is the case when intermittent periods of one or two days or less when the passage of cold fronts to the south and east cause strong westerly winds and very low atmospheric humidity, causing high and extreme fire danger conditions.

Realistically, fire protection associations' (FPAs) budgets are not

going to allow us to 'treat' our way out of the problem by reducing fuel and prescribed burning. Furthermore, there is plenty of evidence that firebreaks alone are ineffective during extreme blow-up events that occur with the passage of cold fronts. These increasingly large fires can burn across 30 or more kilometres before they reach a community, along the way raging through a patchwork of fuels and, most significantly, property lines and differing management regimes. According to the 2017 Environmental Guidelines for Forestry Plantations in South Africa, "The current system of external firebreaks on the plantation boundaries with an internal firebreak system is not always the most efficient and cost-effective system".

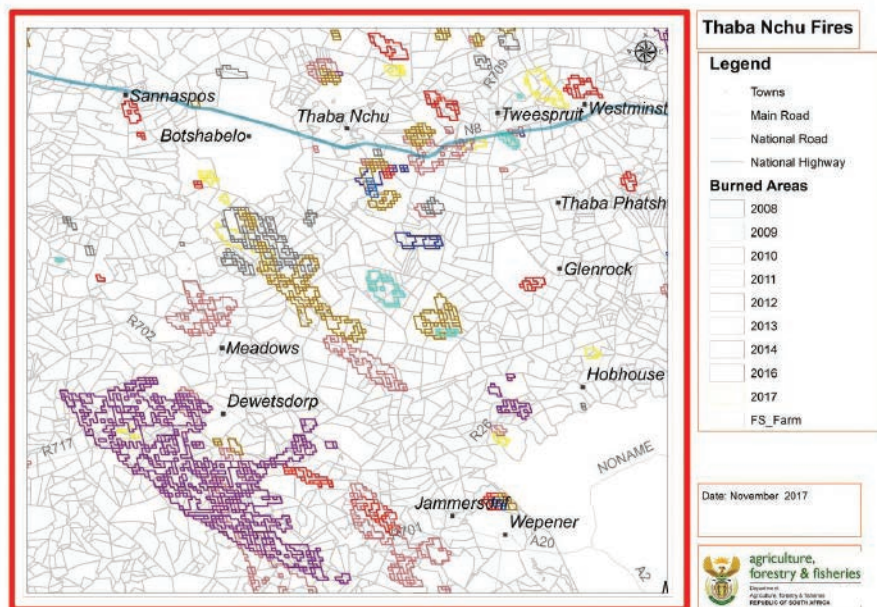
### **Simply trying to live with it is not an option**

Veld fires have a devastating impact on agriculture, running into millions of rand in damages to property, loss of life, livestock, game and grassland annually. Each time households are faced with fire, their ability to recover is severely depleted. Their assets, both social and physical, are gradually worn away by the continual incidence

of fires and recovery can take time. Even if a household is not directly affected, it may lose social capital, as family and social relations break down when people are forced to resettle or temporarily relocate elsewhere. Among people living in fire-prone areas, there is wide variation both in awareness of veld fire risk and the capacity to reduce it. Current planning efforts don't account for this variation; the area of veld fire exposure around communities is often more than 50 times larger than the community itself.

**The only real option is to minimise its adverse impacts**

Traditionally, reducing veld fire risk has been treated as a job for the landowners or district fire brigades and planners were happy to stand on the side-lines. That day has passed and planners can and should have a more significant role in protecting communities from veld fire. Planners are uniquely qualified to assist their communities in creating a more comprehensive approach to veld fire risk; one that goes beyond structure and site design to fundamentally change the location, design and type of development in high veld fire risk zones. Exchanging information between planning and emergency preparedness agencies strengthens the work of the former and alerts the latter to elements whose vulnerability will not be reduced by the proposed development activities. The



Map indicating the regular occurrence of veld fires emanating from Thaba Nchu and damaging commercial farms

rising toll of fire losses in the wildland/urban interface reflects not just a veld fire problem but a problem of poorly planned development and planners can change that.

The impact of humans on fire regimes depends not only on their ability to manipulate fire but on the importance of this manipulation in the face of other constraints. In reconstructing past fire regimes, we therefore need to know when humans could have altered various fire characteristics and the extent to which these were limiting

to fire. Part of the solution involves learning to be very strategic in how we expend the limited funding we have for managing veld fire risk. Being more strategic, starts with taking advantage of the best new science from various disciplines and combining them all together into a landscape/risk management approach.

Effectively addressing veld fire risk to communities on large multi-owner landscapes requires an understanding of the biophysical factors that influence risk, such as fuel loads, topography and weather and social factors such as the capacity and willingness for communities to engage in fire-mitigation activities. Landscape planning combines several strategies into a 'best fit option'. Local municipalities should ensure that new development is located, designed and constructed to withstand natural hazards. They should use information from hazard and risk assessments, land-use plans and zoning regulations to limit development of hazard-prone areas. Compatible uses of floodplains and other hazardous areas should be incorporated into local planning and zoning so that losses are reduced. Such areas could have a high value for recreation, open space or other community use.

Veld fire risk management opportunities can be identified by examining the juxtaposition of veld fire risk transmission and the capacity



Landscape/risk management a holistic approach to managing veld fires



*The risk from veld fires is exacerbated when rural housing developments exceed 45 people/km<sup>2</sup>*

► and likelihood that landowners will conduct mitigation activities. Biophysical-social assessments within fireheds are a key step in identifying localised comparative advantages in mitigation. Veld fire mitigation planning could partition veld fire risk within fireheds among major land ownerships according to mitigation capability. Locations where veld fire risk transmission and risk mitigation potential coincide would indicate places where the most significant opportunities exist for reducing veld fire risk. Areas where high risk of veld fire transmission coincides with low mitigation potential by landowners could benefit from targeted policy interventions, such as education and technical assistance, to facilitate efforts among private landowners to reduce veld fire hazards. Examples of this include emergency vehicle access such as driveways, turnarounds and emergency access roads, marking of roads and property address markers, approved water sources and adequate water supply.

We must consider the suite of actions required to mitigate the threat of catastrophic veld fires. In this era of big data, precise information is available on past veld fires that allow fine-scale calibration risk, the risk transmission from large fires on fire-prone, fragmented landscapes and the web of social ties among the people and communities who call these forests home. Both realms, trees and people, matter when it comes to

nearly any fire risk but especially within the larger context of large fires that can burn hundreds of thousands of acres and cause huge losses around the wildland-urban interface (WUI).

A locally adopted system based on fuel load management designed to create a pattern of adjoining areas/farms that have no fuel or a reduced fuel load that will stop a fire or reduce it to that of a moderate fire and serve as a buffer zone from where successful ground and aerial fire fighting can take place, should be considered. Landscape planning policies are most effectively applied at the local (sector) level when there is cooperation and collaboration between all levels of government. It is important that there is an integrated approach to decision making and a strong partnership between local Government, FPAs and the community. This requires planning at a local or FPA level.

The process must be action-oriented with an evaluation method that is both risk-based and cost effective. Beyond the expected fuel reduction actions, the suite of activities may include changes in policy or procedures at all levels of government. However we proceed, we must look for solutions that yield financial returns that help offset costs. Our goal should be to establish fire-resilient landscapes and fire-adapted communities that can withstand veld fire without the damage and danger currently being experienced.

Ecosystem services are essential in mitigating against risk and vulnerability and building resilience, while changes in these may result in increased exposure to risk and consequently greater vulnerability. Ecosystem management requires a landscape-scale approach to planning, managing and restoring ecosystems and not simply a focus on small-scale site impacts.

A landscape approach recognises the need to include grassland conservation with the management of crop production across the entire landscape. Conservation actions should focus on maintaining the functional ecosystems, the animal and plant assemblages and ecological structures. This means that the grasslands on an estate can be managed and maintained in as near a natural state as is practicable, allowing for connectivity between the grasslands across the landscape through neighbour agreements. This allows the maintenance of ecological structure that operates at a larger scale than just estate level. Even grasslands that have a reduced number of grass species as a result of overgrazing, can still allow for the maintenance of ecological structure.

The first step that must be taken in any effective risk management effort is the identification and profiling of hazards. It is only logical that a manager concerned with treating a community's risk must first know what hazards exist and where they exist. Understandably, it is impossible to plan for or prevent every possible contingency, so most government and other organised emergency management entities will focus their efforts upon those hazards that would be likely to result in the greatest undesirable consequences.

The goal of hazard identification is to establish an exhaustive list of hazards upon which further analysis can be performed. Again, it is not the concern of those identifying the hazards to consider what their likelihood or consequences may be. This is a process in which more is definitely better. It describes a new way of defining veld fire protection planning boundaries based on the scale of veld fire risk, rather than administrative and political boundaries. Communities show their

Landscape management can be used to identify 'Koppies' in the landscape that could be programmatically burnt out in a quarter year rotation creating islands where lower fuel loads exist.

Policies would also identify areas where one can fight veldfires on the terrain of ones choosing.



strength when pulling together after a disaster; the challenge is to revise the way we approach and deal with fire risk so that communities can pull together to take action before a disaster and adopt a proactive approach instead of a reactive one. This hazard data is the foundation on which natural hazard mitigation plans are developed.

Synthesising risk assessment results according to the location dimension allows for the landscape to be zoned according to broad strategic response categories. This process is not dissimilar from past practices that stated objectives and appropriate responses at the administrative fire management unit level but with the explicit intention to create zones that are spatially logical relative to landscape attributes, fire management operations and assessed risks and that therefore translate more clearly to fire management objectives and response guidance.

Highly detailed veld fire risk maps can assist in the planning of desired land uses that reduce communities' veld fire risks. By identifying areas where veld fires are likely to occur, risk maps help prioritise areas of concern and guide decision making efforts. Veld fire risk maps are a data visualisation tool very useful to present the results during the risk assessment process and therefore to establish planning and management guidelines. More specifically fire risk maps offer a format of lighting a more efficient allocation of existing fire-prone areas within a landscape in which management practices are

required to reduce the likelihood and potential negative impacts of veld fires. Planning would delineate those areas on a map enabling planners to develop a serial of requirements that all planning strategies within the fire-hazard area must follow.

Land can be designated eg by zoning or classification to reflect the most compatible uses appropriate for the environment. For example, in areas of an identified hazard or high risk, development may be prohibited, restricted or designed in such a way to mitigate impacts. The designated area can then be suitably managed using the direction of the plan or planning scheme and specific development and building controls.

Landscape management planning should ensure that fire plans are up to date and check that fire fighting equipment is operative at the required moment. Such fire plans would include contact details of key people able to assist during the emergency; location of equipment such as all-terrain vehicles, fire beaters etc; prioritisation of key infrastructure and landscapes to protect; location and seasonality of nearby water resources; information of tracks that are suitable or not for dispatching in a given fire event. Thus, fire rescue services can plan in advance by positioning equipment where it is expected to be required and sharing assets across regional borders.

Landscape management planning would promote proactive policies

and practices in order to save lives and protect properties and resources before the hazard occurs, while dealing with fundamental practices of mitigation, preparedness, response and recovery. Included in the concept of risk management planning is the basic assumption that the impact of disasters can be avoided or reduced when they have been anticipated during development planning. Mitigation of disasters usually entails reducing the vulnerability of the elements at risk, modifying the hazard-proneness of the site or changing its function. All in all, the necessity to integrate veld fire prediction in territorial-scale planning emerges as it helps to face a more efficient veld fire risk management and share responsibilities among all relevant stakeholders.

It is the FPA and its stakeholders in conjunction with land use planners who are best at assessing their current condition and finding solutions that work; no other entity can accomplish local planning for a community. The resilience and coping mechanisms of communities affected by disasters have demonstrated the importance of local and traditional knowledge in the reduction of risk and the effects of hazards. Landscape/risk management will assist the insurance industry in quantifying the risks ie to life, property and possessions to policyholders of extreme weather-related veld fire events, including the probability of a destructive veld fire, the exposure and vulnerability to that veld fire and the potential cost of being affected by that veld fire. ▲