



What a landowner needs to know about **FIRE MANAGEMENT**



Periodic natural fires have always occurred in fynbos and renosterveld ecosystems. In fact, fires are vital to retain fynbos and renosterveld in an ecologically healthy condition. Fire is an important ecological driver required to maintain the species richness in these ecosystems. Many plants actually need fires to reproduce and ensure their longterm survival. The challenge today is how to use fire in a fragmented and highly modified modern landscape to ensure the survival of all plant and animal species. Although fynbos is a fire-adapted system, just one or two inappropriate fires at the wrong time of year, or no fire at all, can cause the local extinction of species. However, local differences in habitat, geology and climate preclude a 'recipe' approach.

The most important use of fire in conservation management is to maintain viable and healthy populations of all plant and animal species present. Other objectives may include: reduction of fuel load to prevent unmanageable wildfires; control of invasive alien plants; promotion of desirable plants for the flower-picking industry; or safeguarding property and infrastructure. Using fire to improve grazing or increase water yield in catchments can be disastrous and may cause local extinction of species. Furthermore, high grazing pressure after a fire can have a worse affect on veld condition than the fire itself.

Principles of Fire Management

Frequency

The interval between fires should largely be determined by the growth rate of natural, existing plants. No fire should be permitted in fynbos until at least 50% of the population of the slowest-maturing species in an area have flowered for at least three successive seasons (or at least 90% of the individuals of the slowest maturing species in the area have flowered and produced seed). Similarly, a fire is probably not necessary unless a third or more of the plants of these slow-maturing species are senescent (i.e. dying or no longer producing flowers and seed).

Research suggests that, under natural conditions the **minimum** fire return interval for moist mountain and lowland fynbos should be between 12 and 20 years and arid mountain fynbos 25 years, whilst that of moist renosterveld (e.g. in coastal plain areas) should be around 10 years and arid renosterveld (e.g. the inland areas) between 15 or more years. The variance in the length of the interval will be dependant on climatic and rainfall cycles, as well as the aspect on which the vegetation occurs. Arid fynbos, from e.g. the Cederberg and Koue Bokkeveld, has a significantly longer fire cycle of up to 50 years. Fire at intervals greater than 25 years may result in fynbos from moist climates becoming senescent but, generally, the greatest challenge is to protect fynbos from fires that are too frequent.

Although not much research has been conducted on the role of fire in renosterveld, it is likely that the above guidelines are a good starting point. Again, regional variances in renosterveld habitats preclude a 'recipe' approach. As renosterveld can contain a high proportion of grasses that are fast growing and highly flammable, it can burn more frequently than fynbos. It should however be noted that there are often individuals of *Protea* species present in some renosterveld

areas, and these species are good indicators for determining fire intervals. However, renosterveld is less dependent on fire than fynbos and too frequent fires could be detrimental for the ecosystem. Fires are nevertheless very important for many species to stimulate seed germination, especially those species that are dependent on ants for seed dispersal. While fire will promote grass regeneration and can temporarily improve grazing, regular burning in renosterveld to promote a 'green flush' can result in the disappearance of a number of plants that require longer fire cycles (e.g. the legumes that fix nitrogen into the soil).

Intensity

Fire intensity is closely associated with season of burn. The intensity of a fire is influenced by the fuel load, fuel moisture, relative humidity and wind speed. The intensity can be manipulated by either reducing the fuel load (i.e. burning more often) or by selecting conditions that will lead to the desired type of fire. Most fynbos species require high intensity fires for survival, however low intensity burns are often favoured for safety reasons. This is however not recommended as such burns could lead to loss of species that do need high intensity fires (e.g. *Leucospermum* (Pincushions), *Mimetes* (Pagoda), etc.) and favour small-seeded, often weedy or pioneer species such as *Helichrysum* spp. (everlastings) and *Stoebe* (slangbos). Repeated, low intensity fires will result in an increase in these weedy species, which will increase the flammability of the veld at an early age. Alien plants impact significantly on intensity (and consequently frequency) due to their flammable oils and the greater biomass created by the density of invasion.

Season

Due to the Mediterranean climate (summer drought) over most of the Fynbos biome, natural fires occur mainly in sum-

mer but can occur at any time under suitable weather conditions. Prescribed burning in the summer months (Dec– Feb) is seldom done due to the risk of runaway fires. Burning is usually only feasible in March and early April. Generally, fire experts consider late summer and early autumn (February to early April) the best time to burn. Seedlings that establish after such fires have the best chance of survival, because they have the generally cooler and wet months during late autumn, winter and spring to manifest themselves, before the following summer.

Proportion of area burned - maintaining a landscape mosaic

On large properties (1000+ ha) it is advisable to maintain a mosaic of different vegetation ages. Block burns are however expensive to implement. Weighing up ecological need, financial implications and practical reality, it is recommended that land managers aim at fire management blocks of 300-500

hectares, if possible. If the property is less than 300 hectares, make the fire management blocks as large as possible – preferably more than 100 hectares each. Any area of less than 50 hectares, should be burnt in one fire event - **do not subdivide the area into smaller blocks**. Small fires of limited extent are problematic because of the significant loss of seeds to seed eaters (e.g. rodents) after the fire. The other problem pertains to the fire intensity – fires take time to build up adequate energy and gain momentum to create a clean burn. If need be (and possible), consider consolidation into larger management units with neighbouring properties.

Authority to burn

In order to undertake a burn during the prescribed season, permission must be obtained from the local Fire Protection Association (if operational) and the District Municipality. CapeNature should also be notified.

Do's and Don'ts of Fire Management

DO

- Burn vegetation at the end of summer or early autumn.
- Ensure you have adequate firebreaks to be able to fight runaway fires – NOTE: firebreaks do not stop/prevent fires – they simply create access points to fight fires from. The Veld and Forest Fire Act states that owners must pay attention to weather, climate, terrain and vegetation in deciding how to prepare a firebreak. If optimal firebreak position is not along a common boundary with neighbours, decide on relocation of fire breaks in collaboration with neighbouring landowners - consider relocating firebreaks to a point where it would be practical to access the area (e.g. existing roads)

A firebreak must:

- be wide enough and long enough to have a reasonable chance of accessing the area to fight the fire (NOTE: Bear in mind that under extreme fire conditions, particularly during strong winds, the widest possible fire breaks will not stop the spread of a fire.)
- not cause soil erosion (it is not advisable to bulldoze firebreaks)
- be reasonably free of inflammable material
- Inform property neighbours of your intention to burn at least two weeks prior to the event.
- Maintain fire fighting equipment and ensure that it is in working order and that people are trained in fire fighting.
- Keep accurate records of fires, using a map of veld age as a basis. Note the date and time of ignition, weather conditions, etc.
- Join a local Fire Protection Association (FPA) or initiate one, as FPA's encourage neighbouring landowners to work together on common fire management issues.

DON'T

- Never burn vegetation in late autumn, winter or spring.
- Don't place livestock onto vegetation during the first 2 years following a fire. Many of the bulbous species need to have adequate time to flower and set seed; small herbaceous species (e.g. buchu, legume, *Erica* species) need adequate time to properly manifest themselves; grass species need to establish and build up their tussocks; many bulbous species that flower after fire are also toxic to domestic animals. After the 2 years, graze veld only during December to March.
- In fynbos, don't burn vegetation unless you can see that at least 90% of the individuals of the slowest-maturing (e.g. non-sprouting *Protea*, *Leucadendron*) species have flowered.
- In renosterveld, don't burn vegetation that is shorter than 50cm and that lacks mature shrubs of a number of different species.
- Don't allow the fuel load to accumulate to dangerous levels.
- Don't leave fires unattended.
- Don't burn on Fridays, weekends and holidays.
- Don't leave an extinguished fire unguarded for at least two days after the burn.

Landowners should devise an appropriate burning strategy, with input from CapeNature on both legal and practical management requirements.

For more information, contact the Fire Management Programme Manager at CapeNature (082 414 6344) or refer to the CapeNature pamphlet 'The Landowner & Fire Protection Associations'.

