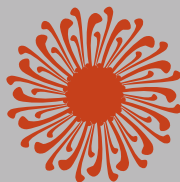
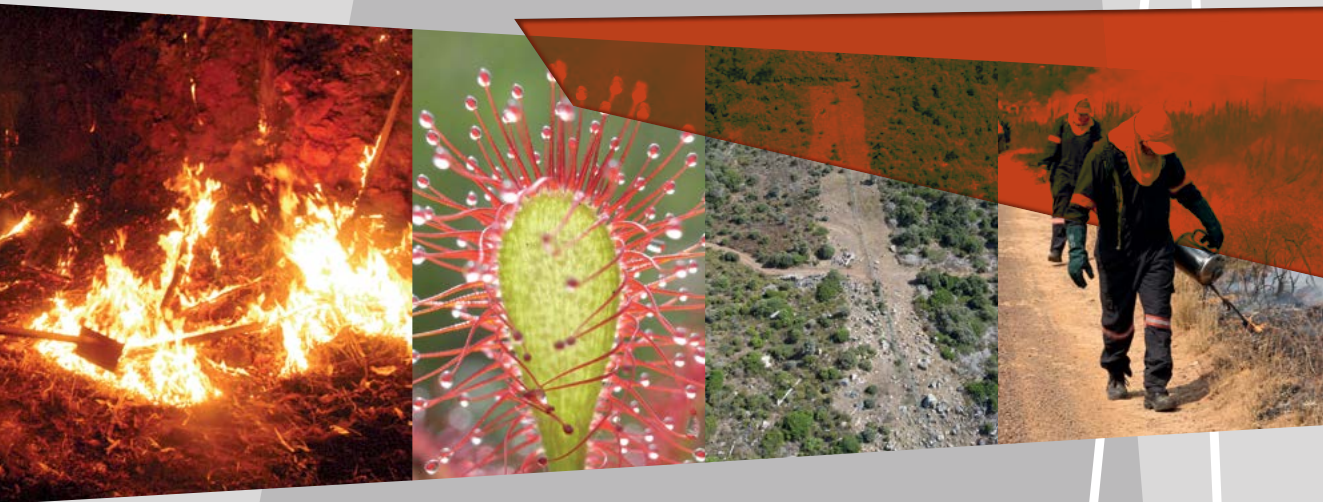


A GUIDE TO INTEGRATED FIRE MANAGEMENT

HANDBOOK

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FYNBOSFIRE

THE INTEGRATED FIRE MANAGEMENT HANDBOOK

ESTABLISHING FIRE PROTECTION
ASSOCIATIONS IN SOUTH AFRICA

“Fire is a bad master but a good servant”



FYNBOSFIRE

This handbook draws on material developed by a number of individuals and institutions including Working on Fire, the Western Cape Provincial Disaster Management Fire Working Group, the Department of Agriculture, Forestry and Fisheries, Council for Scientific and Industrial Research (CSIR), various individual FPAs and FPA managers, Kishugu, and the FynbosFire Project.
Many thanks for all the contributions.

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TABLE OF CONTENTS

Acknowledgements	7
Foreword by the UNDP.....	8
Foreword by Kishugu Non-Profit Company	9
Introduction	10
Guide to the Handbook	11
1 Integrated Fire Management	15
1.1 What is Integrated Fire Management?	15
1.2 What are the components of Integrated Fire Management?	16
1.3 What is the Wildland-Urban Interface?	17
1.4 What are the different types of fires and burns?	18
2 Legal framework	23
2.1 General overview	23
2.2 Local Government Municipal Structures Act (Act No. 117 of 1998)	23
2.3 Disaster Management Act (Act No. 57 of 2002)	24
2.4 Fire Brigade Services Act (Act No. 99 of 1987)	25
2.5 National Veld and Forest Fire Act (Act No. 101 of 1998)	25
2.6 National Environmental Management Act (NEMA) (Act No. 107 of 1998)	26
2.7 Municipal by-laws	26
2.8 Comment	26
3 Landowners and fire	29
3.1 Why should landowners look to manage wildfire?	29
3.2 What are the legal duties of landowners in respect of wildfire prevention as detailed in the NVFFA?	29
3.3 What is the presumption of negligence in relation to wildfires?	29
3.4 FAQ: Why should landowners join an FPA?	30
4 Fire Protection Associations (FPA)	33
4.1 What is an FPA?	33
4.2 What is the role and what are the duties of an FPA?	33
4.3 FAQ: Is the FPA a fire fighting force?	33
4.4 Who has a right and who is obliged to be a member of an FPA?	34
4.5 FPA as a point of interface: who are the typical stakeholders in an FPA?	35
4.6 What role do Fire Protection Associations (FPAs) play in the Wildland-Urban Interface?	35
4.7 Informal Communities in the Wildland-Urban Interface and Fire Protection Associations	36
4.8 Who can register as an FPA?	37
4.9 What is the ideal geographic scale for an FPA?	37
4.10 FPA boundaries	38
4.11 How should an FPA be structured internally?	39
4.12 What makes for a successful FPA?	39
4.13 How are FPA members organised?	40
4.13.1 Fire Management Units	40
4.13.2 What main role players does the law expressly provide for?	40
4.13.3 Governance	45

4.14	Membership administration	49
4.14.1	Membership recruitment	49
4.14.2	Membership application forms	49
4.14.3	Membership fees	49
5	What is the legal process for setting up and registering an FPA?	53
5.1	What does the Department require in the initial phase of setting up an FPA?	53
5.2	What does the Department require in the second phase of setting up an FPA?	54
6	What is the legal process for deregistering an FPA?	61
6.1	Deregistration at the instigation of members	61
6.2	Deregistration at the instigation of the Department	61
6.3	Process following on the decision of the Minister to deregister an FPA	61
7	Resourcing an FPA	65
7.1	FPA management models	65
7.2	Financial reporting requirements of the Department	65
7.3	Finances	66
7.4	Funding	67
8	FPA media profile	71
8.1	Fire Awareness	71
8.2	Media	71
8.3	Emergency alerts and warnings	72
9	Umbrella FPAs	75
9.1	Definition	75
9.2	Role and functions of the UFPA	75
9.3	Coordination and oversight	75
9.4	Partnership management	76
9.5	Knowledge management	76
9.6	Structure of the UFPA	77
9.7	Funding the UFPA	78
10	Practising Integrated Fire Management.....	81
10.1	The continual process of IFM	81
10.2	Integrated Fire Management Plan	81
10.3	Integrated Fire Management business unit plan.....	84
10.4	Provincial wildfire plans.....	85
11	Stakeholder mobilisation.....	89
11.1	Integrated Fire Management awareness	89
11.2	How to mobilise stakeholders	90
11.3	Sustaining stakeholder engagement.....	90
12	The FireWise Communities programme	93
12.1	Identifying the need for a FireWise Community	94
12.2	Community involvement	94
12.3	The aims of a FireWise Community	95
12.4	Stakeholder communication	95
13	Risk Assessment	99
13.1	Weather, climate change, and fire trends	99
13.2	Veld types, veld age, and fuel types	101
13.3	How to map fire hazards	101

13.4	Fire history and burn scars	103
13.5	Urban edge activities	104
14	Prevention, protection, and planning	109
14.1	Implementing Wildland Fire Awareness Programmes	109
14.2	What is Community Risk Reduction?	109
14.3	The focus on prevention	111
14.4	Using an integrated approach to fire prevention	112
14.5	Fire prevention campaigns	113
14.6	The Systems Approach (Ecological model)	113
14.7	IFM annual planning	115
14.7.1	IFM annual planner for the Fynbos Biome	1 15
15	Firebreaks	121
15.1	Are landowners legally obliged to create firebreaks?	121
15.2	What is the purpose of a firebreak?	121
15.3	Where should firebreaks be located?	122
15.4	What is the procedure for optimal firebreak planning?	123
15.5	What is the approximate costing of a firebreak?.....	123
15.6	Who determines how broad a firebreak should be?	123
15.7	What does “maintaining a firebreak” mean?.....	124
15.8	What happens if a landowner fails to create appropriate firebreaks?	124
15.9	Are you required to cut firebreaks through indigenous vegetation?	124
15.10	Fuel load management	124
15.10.1	Legislation that compels landowners to reduce fuel loads	125
15.10.2	How are fuel loads reduced?	125
15.11	What is the procedure for optimal planning of fuel load reduction?	126
15.12	Prescribed burning	126
15.12.1	Relevant legislation	126
15.12.2	CARA burning permit	127
15.12.3	Local authority by-laws	127
15.12.4	What is the procedure for obtaining a burning permit?	127
15.13	Who is responsible for managing a prescribed burn?	127
15.14	Decision matrix for deciding whether to undertake a prescribed burning	128
15.15	Fire danger rating and early warning systems	130
15.15.1	What is the Fire Danger Rating?	130
15.15.2	National veldfire risk map	130
15.15.3	How is the Fire Danger Rating determined?	130
15.15.4	What is the Fire Danger Rating Table?	131
15.15.5	How is the Fire Danger Index normally communicated?	132
16	Detection, coordination, and suppression	135
16.1	Fire detection	135
16.1.1	Manual detection systems	135
16.1.2	Electronic detection systems	135
16.2	The Incident Command System	136
16.3	Communication and dispatch	141
16.4	Fire suppression	141
16.4.1	Do all landowners require fire fighting equipment?	142
16.4.2	Initial attack	142
16.4.3	Do landowners have to pay for fire fighting on their land?	143
16.4.4	Extended fire suppression	144
16.5	Safety considerations for firefighters and civilians	144
16.6	Managing multiple incidents	145

17	Rehabilitation	149
18	Management: Coordination, record-keeping, and monitoring and evaluation	153
18.1	Coordination	153
18.2	Record-keeping	153
18.2.1	Membership database	153
18.2.2	Compliance	154
18.2.3	Training Providers	154
18.2.4	Education	154
18.2.5	FPA administration systems	154
18.2.6	Financial administration	155
18.3	Reports	155
18.3.1	National Fire Reports	155
18.3.2	To whom must an FPA report annually?	155
18.3.3	What is the format of the annual FPA report to DAFF?	156
18.4	Assessments	156
18.4.1	What is the purpose of an assessment?	156
18.4.2	How should landowner-compliance be assessed?	156
18.4.3	Is the FPA functional?	158
19	Mapping and GIS systems	163
20	Training: Building IFM capacity	169
21	Incentives and Enforcement	173
21.1	Incentives	173
21.1.1	Incentives offered by FPAs	173
21.1.2	Rates rebate	173
21.1.3	Fire fighting cost rebates	173
21.1.4	Insurance rebates	173
21.2	Enforcement	174
21.2.1	What is the role of the FPA in enforcement?	174
21.2.2	What are the offences created by the National Veld and Forest Fire Act? ...	174
21.2.3	What are the penalties for contravention of the National Veld and Forest Fire Act?	175
21.2.4	Who has the power to enforce the National Veld and Forest Fire Act?	175
21.2.5	What are the legal powers of the FPO?	175
21.2.6	What is the procedure for dealing with non-compliance?	175
21.2.7	What other sanctions does an FPA have at its disposal?	176
22	Glossary	179

Addendum: List of Tools

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- South African Department of Cooperative Governance and Traditional Affairs
- South African Department of Economic Development
- Western Cape Department of Agriculture
- Western Cape Department of Local Government and Housing
- Eastern Cape Department of Local Government and Traditional Affairs
- National Disaster Management Centre, Western Cape Provincial Disaster Management Centre and fire fighting and disaster management services in District and Metropolitan Municipalities across the Fynbos Biome
- Expanded Public Works Programme's Working on Fire and Working for Water
- Registered Umbrella Fire Protection Associations and Fire Protection Associations within the Fynbos Biome
- CapeNature
- Council for Scientific and Industrial Research (CSIR)
- Eastern Cape Parks and Tourism Association
- National Committee on Climate Change
- South African National Biodiversity Institute
- South African National Defence Force
- South African National Parks
- South African Weather Service
- USA National Fire Protection Association
- Kishugu
- Flower Valley Trust
- MTO Forestry

FOREWORD BY THE UNDP

The United Nations Development Programme (UNDP) is proud to be part of this comprehensive and practical Integrated Fire Management handbook. The handbook is one of several outputs achieved under the Global Environment Facility (GEF)'s Special Climate Change Funded FynbosFire Project, led by the Department of Environment Affairs, through UNDP.

The project's main objective is to develop and implement integrated disaster risk management strategies to address climate change-induced fire hazards and risks in the Fynbos Biome of South Africa.

The project contributes towards the United Nation's recently adopted Sendai Framework for Disaster Risk Reduction (2015-2030) as well as the UNDP's Global Commitment to Risk-Informed Development "5-10-50" - a 10 year global programme in support of country efforts to reduce the risk of disasters. The ultimate goal of this Framework is the substantial reduction of disaster risk and losses in lives, livelihoods and health, and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries. These key frameworks as well as the project implemented by UNDP recognise the significance of building national and local level capacities to manage disaster risks; and building capacity at local level to manage increased incidences of natural disasters including fires. This handbook, therefore, directly responds to this objective and can be expected to greatly contribute to improved fire management approaches.

UNDP is confident that the handbook will go a long way towards strengthening the capacity of people and institutions in the Biome, to implement effective and proactive integrated fire management systems for the reduction of hazardous fires. As primary users, Fire Protection Associations in the Western Cape have already piloted the Handbook and have confirmed its usefulness and practicality.

In closing, let me reiterate UNDP's key message going into Sendai, which gained much traction at the Conference 'if it isn't risk-informed, it isn't sustainable development'.

On behalf of the UNDP and GEF, I want to thank the various partners who have been involved in the development of the handbook and hope it will contribute to better Integrated Fire Management in South Africa.

Gana Fofang

UNDP Resident Representative

FOREWORD BY KISHUGU NON-PROFIT COMPANY

The global fire fighting community comprises a special group of people committed to protecting lives, livelihoods, property, and the environment - every day.

The South African wildland fire fighting fraternity is a highly regarded member of that global community and this Handbook is a result of their endeavours. It is the culmination of countless workshops and discussions involving multiple stakeholders who stayed the course from the concept stage of the Global Environment Facility's FynbosFire Project in 2006.

They have volunteered their knowledge and experience, while simultaneously establishing and operating Fire Protection Associations (FPAs) in the Fynbos Biome, as well as in other areas of the country. This Handbook distils the tough lessons learnt along the way in a user-friendly and practical manner.

We realised that the material gathered during this project was useful far beyond its intended mandate, and has global applications not just in the Fynbos Biome, but also as a contribution to the global body of wildland fire fighting knowledge.

All material, generic forms and annexures are available online.

The Handbook is grounded in the legal framework of the *South African National Veld and Forest Fire Act 101 of 1998* and explains all the steps from founding a Fire Protection Association to making it a sustainable institution. In so doing, it shifts the focus towards the proactive practice of Integrated Fire Management and away from reactively suppressing wildfires.

Current climate change modelling predicts that ecosystems such as the Fynbos Biome will be subjected to increasing fire danger weather. Yet, fynbos, like many other ecosystems, is "born-to-burn" - it must have periodic fire in order to rejuvenate. Couple this with economic development and an expanding Wildland-Urban Interface with the corresponding influx of people and you have a recipe for disaster.

The likelihood of multiple ignitions and overstretched fire fighting services is very real. Working smart and working together is key to adapting to these changing conditions - and that is what Integrated Fire Management is about.

In the future, simply having a plan for wildland fire suppression is no longer an option. Fire management personnel will be required to be adept at co-ordinating and pooling FPA members' efforts, planning to reduce fire risk at a landscape level, creating public awareness, managing fuels, and balancing the beneficial use of fire in the environment while protecting life and property. It is no small task!

We hope that this Handbook will fulfil a role in capacitating fire managers, extension personnel, and students in the years ahead.

Val Charlton

Managing Director - Kishugu Non-Profit Company

INTRODUCTION

Over the past decade land use changes in many regions of the world has led to an increase in the frequency and severity of wildland fires. In some countries there is also a trend towards an excessive application of fire in land use management.

Wildland fires have a range of social, economic, and environmental impacts—positive and negative—that are well researched. The practice of Integrated Fire Management arose from a need to ensure that wildland fires are able to serve a greater good than the harm they cause.

Integrated Fire Management addresses the problems and issues posed by damaging and beneficial wildland fires within the context of the natural environment and the socio-economic systems in which they occur. It evaluates and balances the relative risks posed by wildland fire with the beneficial or necessary ecological and economic roles that fire may play in a given area, landscape, or region. As a result, Integrated Fire Management integrates the following:

- the entire fire cycle and its different components of prevention, protection, suppression, and rehabilitation;
- the fire management efforts of all land managers whether in respect of public or private land;
- the actions of regulatory agencies with the management measures on the ground; and
- the funding and resource allocation to optimise its benefits and impacts.

An integrated approach seeks to secure the maximum benefit from the available resources and to help communities find cost-effective approaches to maintain desirable wildland fire programmes while limiting fire damage.

When wildland fires do occur, Integrated Fire Management provides a framework for:

- weighing the relative benefits and risks of different wildfire scenarios;
- evaluating whether the effects of a wildfire will be detrimental, beneficial, or benign; and
- responding appropriately, based on stated objectives.

FACT OR FICTION

FACT or FICTION? Fire is always bad

Fiction. Fire is part of the life cycle of natural ecosystems such as the Fynbos Biome. The frequency and seasonality of fire determines which species occurring within the ecosystem persist and which perish. Fires at too short or too long intervals will lead to a loss of plant species, plant diversity, and a reduction in biodiversity. This makes the practice of Integrated Fire Management important.

Fynbos and Fires

Fynbos and Renosterveld plants have adapted to survive wildland fires. Broadly, in relation to fire, plants can be categorised as:

- a. Sprouters. These plants re-sprout after a fire, largely as a result of an underground rootstock from which new coppice shoots are produced after fire.
- b. Non-sprouters or re-seeders. Fire kills these plants, but their seeds are protected against fire. Often, prior to dying, they produce copious amounts of seeds that germinate in post-burn conditions or they accumulate their seeds in the soil, safe from granivores and fire.
- c. Evaders such as rocky-refuge species. These grow in protected sites that rarely burn, or are not exposed to hot fires, or that burn incompletely.



GUIDE TO THE HANDBOOK

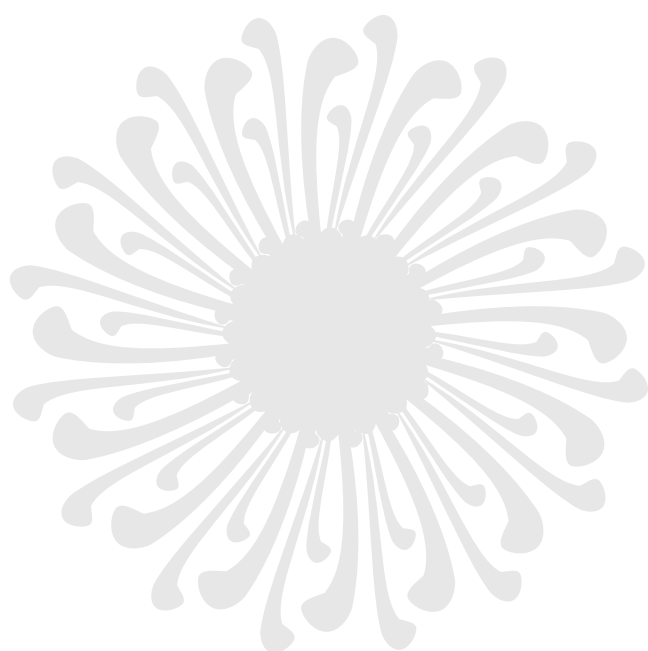
Various stakeholders have legal responsibilities towards managing wildfires and their associated risks. The stakeholders include different spheres of government, both in their regulatory capacity and as land-owners, private landowners, and land managers. Other stakeholders are involved in managing wildfires not because they are under a legal obligation to do so but because it forms part of sound land management practices. Many of the stakeholders structure some of their involvement through Fire Protection Associations.

The Handbook aims to assist Fire Protection Associations and other stakeholders involved in Integrated Fire Management to harness best practices and improve service delivery.

The Handbook aims to provide:

- a shared framework for understanding Integrated Fire Management;
- guidelines for setting up and managing a Fire Protection Association;
- *tools for implementing Integrated Fire Management*  for use by FPAs and other stakeholders; and
- links to useful resources.





CHAPTER ONE

INTEGRATED FIRE MANAGEMENT





1 INTEGRATED FIRE MANAGEMENT

1.1 What is Integrated Fire Management?

Integrated Fire Management (IFM) incorporates different fire management activities in a strategic framework to reduce the overall impact of unwanted wildfire damage and promote the beneficial use of fire.

A clear and shared understanding of Integrated Fire Management is key to the success of engaging all stakeholders involved in fire management. Globally and locally there are several definitions and frameworks for understanding Integrated Fire Management. Most of these revolve around a similar group of functions organised in slightly different ways.

The Handbook applies the following definition of Integrated Fire Management:

A series of actions that includes fire awareness activities, fire prevention activities, prescribed burning, resource sharing and co-ordination, fire detection, fire suppression, fire damage rehabilitation and research at local, provincial and national levels in order to create a sustainable and well balanced environment, reduce unwanted wildfire damage, and promote the beneficial use of fire.

LESSON II

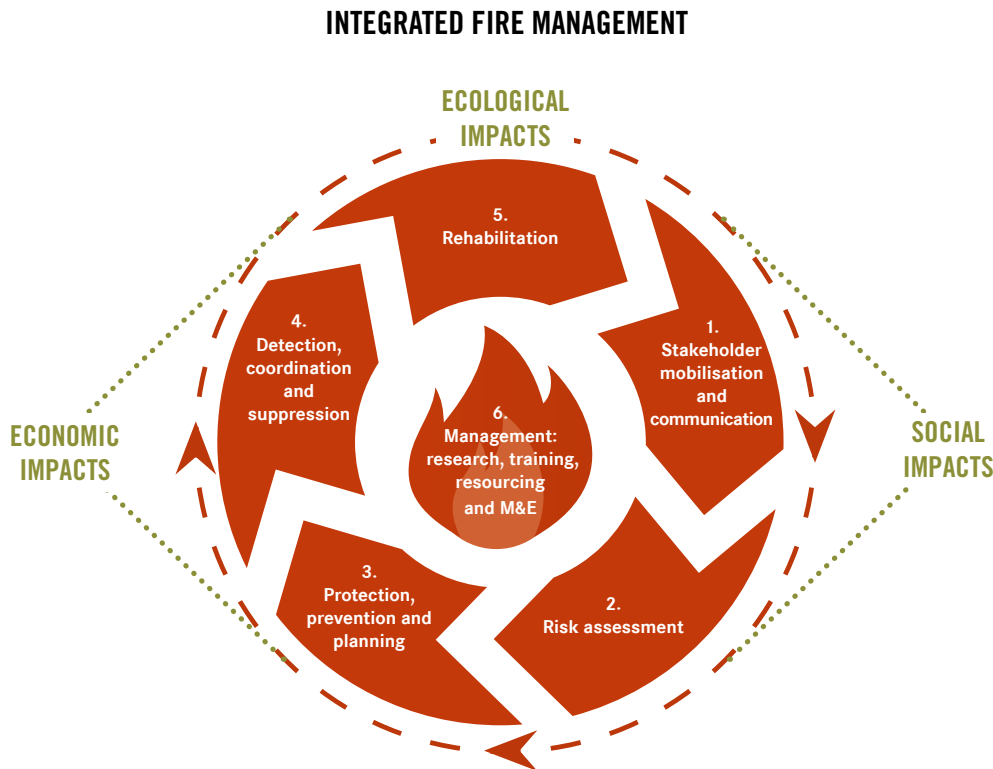
A number of key lessons can be drawn from the review of global practices around Integrated Fire Management investigated in New Zealand, Australia, France, and California in the United States including the following:

- the need for high levels of public awareness;
- the need for a holistic and integrated approach to managing wildland fire risks;
- the importance of well-functioning public-private partnerships around wildland fire management;
- the significance of state resources to support Integrated Fire Management; and
- the importance of taking a regional approach that enables resources to be better matched to threats and for resources to be pooled.



1.2 What are the components of Integrated Fire Management?

The diagram below provides a consolidated overview of the six components of IFM and a common framework for discussing and organising efforts around IFM.



Each of the six components is broadly defined below.

Component	Description
1. Stakeholder mobilisation and communication	Stakeholder identification and mobilisation including establishment of Fire Protection Associations and the ongoing communication with members of FPAs, landowners within the FPA area who are non-FPA members, and other key stakeholder groupings.
2. Risk assessment	Framework for assessing and quantifying the wildfire risks in an area based on the area's vegetation type and age, the vegetation fire ecology, history of fire, weather, and the likely impact of fires on life as well as social and economic activities.
3. Protection, prevention and planning	Activities to reduce or mitigate fire risks including fire awareness, training, fuel-load reduction, firebreak planning and execution, prescribed burning, law enforcement and compliance monitoring, and optimal approaches to suppression.
4. Detection, coordination and suppression	The detection and monitoring of fires once they are burning, the coordination of stakeholders and resources to fight the fire, and management of suppression activities including incident command during suppression activities.

5. Rehabilitation	Rehabilitation of damage after a fire in order to restore the ecosystem including identification of rehabilitation needs, planning of rehabilitation, and management of rehabilitation.
6. Management	The overall coordination of IFM, record-keeping and data collection, monitoring and evaluation and reporting to stakeholders, training and research.

Within each of these components there are several different stakeholders, each with its own set of responsibilities and roles, including:

- landowners and land managers;
- organised associations of landowners such as conservancies and agricultural associations;
- Fire Protection Associations;
- District and (where delegated) Local Government or Traditional Leaders;
- Provincial and District Disaster Management;
- National Government; and
- Working on Fire.

 For more information on the roles and responsibilities of different stakeholders under each of the six components see *Integrated Fire Management Roles*.

1.3 What is the Wildland-Urban Interface?

Wildlands are places where there is enough vegetation to sustain a vegetation fire. These areas include nature reserves, vacant land often invaded by woody invasive alien plants, timber plantations, orchards, vineyards, and agricultural land.

The Wildland-Urban Interface is the transition zone between open land that is generally unoccupied and contains flammable vegetation fuels and human settlements, the area where urban development meets wildlands (in town planning this area is sometimes referred to as the “urban edge”), where homes and structures are built among forests, shrubs or grasslands, or where there is a presence of people and permanent infrastructure in the proximity of flammable vegetation.

This is where people live and earn their livelihoods, and it is here where people are exposed to the greatest risk of being injured or killed by wildfires, and property has the greatest potential to be damaged or destroyed by wildfires.



The Wildland-Urban Interface where flammable vegetation meets developments



Homes on the Wildland-Urban Interface are at risk from wildfire

As urbanisation spreads and urban populations increase, the buffers between the urban edge and natural areas disappear. In addition, more residences are being built within the natural areas. As a result, the number of buildings and homes damaged by wildfires is increasing drastically. It is on this interface that wildfires can cause the greatest harm and communities living in the vicinity of it are at greater risk from wildfires.

The majority of wildfires start on the Wildland-Urban Interface and are mostly caused by humans. The risk of wildfires starting from human settlements is exacerbated in South Africa by the number of informal settlements located on the urban edge (in the Wildland-Urban interface).

Integrated Fire Management strategies must proactively manage the interface and reduce the damage caused to it. In addition it should limit the number of fires that emanate from human settlements abutting on the interface, or from homes and human infrastructure such as roads located within the natural areas.

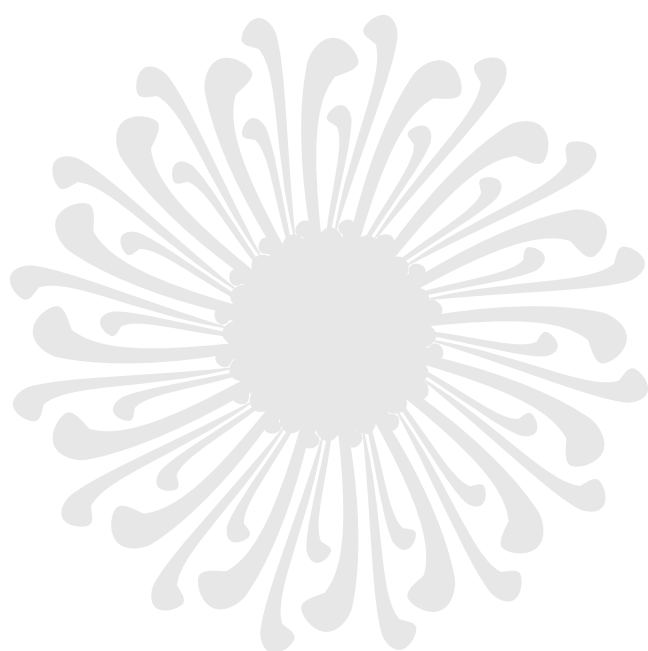
1.4 What are the different types of fires and burns?

IFM uses specific terminology to describe the types of fires and burning conditions. Some of these are listed below.

Term	Description
Arson fire	An uncontrolled fire wilfully ignited by anyone to burn or spread to vegetation or property without consent of the owner or his/her agent.
Block burn	A prescribed burn in a pre-determined and specified land area.
Brush fire	A fire burning in vegetation that is predominantly shrubs, brush, and scrub growth.
Catastrophic fire	A fire that causes unrecoverable damage to property, loss of life and limb. In plantations, the area is more than 100 ha (250 acres).
Controlled fire	A fire that is subject to a line of control around a fire, any spot fire from it, and any interior island to be saved, effectively preventing any unplanned spread.
Controlled burn	Often incorrectly used to refer to a “Prescribed burn”. See “Controlled fire”.
Crown fire	A fire that burns in and advances through the top leaves or the crown of trees or shrubs.

Term	Description
Debris burning fire	A fire spreading from any fire originally ignited to clear land or burn rubbish, garbage, crop stubble, or meadows (excluding incendiary fires).
Ecological burn	A form of prescribed burning involving the treatment of vegetation by burning it in predetermined areas to achieve specified ecological objectives.
Fire	In this context, either a wildfire or a prescribed burn.
Forest fire	A fire burning mainly in a forest and/or woodland.
Fuel reduction burn	The planned application of fire to reduce hazardous fuel quantities, and undertaken in prescribed environmental conditions within defined boundaries.
Ground fire	A fire that is burning below the surface of the ground in roots, peat, coal, decaying plant material, etc.
Human-caused fire	Any fire caused directly or indirectly by a person.
Megafires	A wildfire or concurrent series of wildfires that is in the upper percentile of the fire regime.
Open burn	Burning of wastes in the open or in an open dump.
Out-of-control fire	A fire that has reached the intensity where no attempt is or can be made to stop the head of the fire using a direct attack. Only the flanks can be attacked.
Point of ignition or fire origin	The place where a fire was started or ignited.
Prescribed burn	The controlled application of fire under specified environmental conditions to a predetermined area and at the time, intensity, and rate of spread required to attain planned resource management objectives. It is undertaken in specified environmental conditions. Generally, it requires the specific authorisation of the fire management authority.
Prescribed fire	Any fire ignited by management actions to meet specific objectives. A written, approved burn plan must exist, and approving agency requirements (where applicable) must be met, prior to ignition.
Spot fire	Isolated fire started ahead of the main fire by sparks, embers or other ignited material, sometimes to a distance of several kilometres.
Structural fire	A fire originating in or burning any part or all of a building or shelter.
Surface fire	Fire that moves through combustible material located on the ground.
Uncontrolled fire	Any fire that threatens to destroy life, property, or natural resources, and (a) is not burning within the confines of firebreaks, or (b) is burning with such intensity that it could not be readily extinguished with ordinary, commonly available tools.
Veldfire	Described in the NVFFA as “a veld, forest, or mountain fire”. A vegetation fire outside the urban-rural interface; a general term to describe fire in vegetation. In this context these forms of fire are collectively referred to as “wildfires”.
Wildfire	A vegetation fire accidentally or deliberately ignited but burning out of control, including veld and forest fires.
Wildland fire	A fire burning outside the urban areas, either as a prescribed burn or as a wildfire.





CHAPTER TWO

LEGAL FRAMEWORK





2 LEGAL FRAMEWORK

2.1 General overview

Various pieces of legislation impact on Integrated Fire Management and set out mandates for different stakeholders. This legislation stipulates that various government departments, spheres of government, and the private sector are mandated to deal with aspects of Integrated Fire Management responsibilities. In many cases these mandates overlap, in others there is a lack of clarity. While the inconsistencies and overlaps can be easily addressed through cooperative governance agreements and structures, it makes for a complex institutional context.

The following pieces of legislation have been identified as having a direct bearing on Integrated Fire Management in South Africa:

- a. The Constitution of the Republic of South Africa, 1996;
- b. Local Government: Municipal Systems Act (Act 32 of 2000);
- c. Local Government: Municipal Structures Act (Act 117 of 1998);
- d. Disaster Management Act (Act 57 of 2002);
- e. Fire Brigade Services Act (Act 99 of 1987);
- f. National Veld and Forest Fire Act (Act 101 of 1998);
- g. Conservation of Agricultural Resources Act (Act 43 of 1983);
- h. Environment Conservation Act ("ECA") (Act 73 of 1989);
- i. National Environmental Management Act ("NEMA") (Act 107 of 1998);
- j. National Environmental Management: Air Quality Management Act (Act 39 of 2004);
- k. National Environmental Management: Biodiversity Act (Act 10 of 2004);
- l. National Environmental Management: Protected Areas Act (Act 57 of 2003);
- m. National Environmental Management: Protected Areas Amendment Act (Act 15 of 2009);
- n. Pollution Prevention Act (Act 45 of 1965);
- o. National Forests Act (Act 84 of 1998);
- p. National Heritage Resources Act (Act 25 of 1999);
- q. National Parks Act (Act 57 of 1976);
- r. National Water Act (Act 36 of 1998);
- s. Western Cape Environmental Implementation Plan – November 2002; and
- t. Western Cape Planning and Development Act (Act 7 of 1999).

In addition, the following legislative developments may have an impact on Integrated Fire Management.

- i. Discussion paper on Fire Brigade Services Legislation: Towards a Fire Brigade Services White Paper, Department of Cooperative Governance, March 2013;
- ii. Draft National Veld and Forest Fire Amendment Bill.

In this section an overview of the most relevant of these is provided.

2.2 Local Government Municipal Structures Act (Act No. 117 of 1998)

The Department of Cooperative Government and Traditional Affairs administers the Local Government Municipal Structures Act. The Act provides for the establishment of municipalities in accordance with the requirements relating to categories and types of municipality. It also provides for the appropriate division of functions and powers between categories of municipalities.

Section 84 of the Act deals with the division of functions and powers between district and local municipalities and provides that a district municipality has the following functions and powers in relation to fire fighting services:

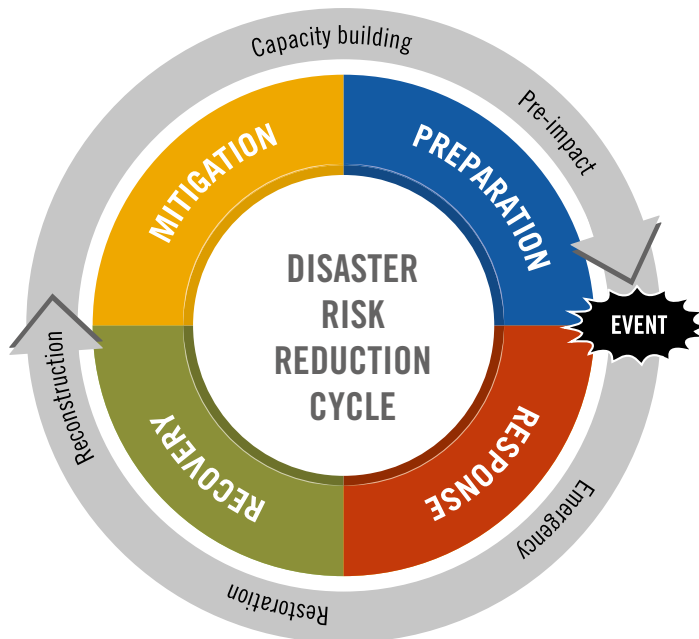
- planning, coordination, and regulation of fire services;
- specialised fire fighting services such as mountain, veld, and chemical fire services;
- coordination of the standardisation of infrastructure, vehicles, equipment, and procedures; and
- training of fire officers.

As regards Integrated Fire Management, it is accepted that this Act allocates the primary regulation and management of wildfires to the district municipalities. Where local municipalities have institutional capacity, this responsibility has been delegated from the district municipality to the local municipality via a cooperation agreement.

2.3 Disaster Management Act (Act No. 57 of 2002)

The Department of Cooperative Government and Traditional Affairs administers the Disaster Management Act. The Act provides for an integrated and coordinated disaster management policy that focuses on preventing or reducing the risk of disasters, mitigating the severity of disasters, emergency preparedness, rapid and effective response to disasters, and post-disaster recovery amongst others. Fires, including wildland fires, are a major hazard to the country and are regarded as one of the potential disaster areas. The Act requires each sphere of government to prepare a disaster management plan and mandates provinces and districts to respond to such disasters.

Note: The principal act was amended in December 2015. Act 57 of 2002 must be read in conjunction with the Amendment Act (Act No.16 of 2015).



Section 42 of the Act states that the district municipality must establish a disaster management strategy. Section 32 states that a disaster management centre must promote an integrated and coordinated approach to disaster management in the municipal area, with special emphasis on prevention and mitigation, and coordinate other spheres of government and role-players. Section 30(1)(b) creates an obligation on the service to adopt proactive mitigation, which would include mitigation of wildfires:

“30. (1) A provincial disaster management centre –
(b) must promote an integrated and coordinated approach to disaster management in the province, with special emphasis on prevention and mitigation. By –
(i) provincial organs of state in the province; and
(ii) other role-players involved in disaster management in the province”

The Act gives the executive of the province the overarching control of a provincial disaster, with powers that override those of the Chief Fire Officer of a service within an affected municipality:

“40. (1) The executive of a province is primarily responsible for the co-ordination and management of provincial disasters that occur in the province, irrespective of whether a provincial state of disaster has been declared in terms of section 31”.

The executive of the province, in adopting proactive mitigation steps designed to minimise the likelihood or impact of severe wildfires, therefore may set certain requirements for district and local authorities and other stakeholders. The Disaster Management Act thus provides for the establishment of the framework within which Integrated Fire Management must take place.

2.4 Fire Brigade Services Act (Act No. 99 of 1987)

The Department of Cooperative Government and Traditional Affairs administers the Fire Brigade Services Act. The Act is the primary piece of legislation regulating fire services and seeks to provide for the establishment, maintenance, employment, coordination, and standardisation of fire brigade services.

In terms of the Act, district and local municipalities are required to establish a fire fighting service. The Act also provides for the Minister to designate fire fighting services. Further, it provides for the appointment of a Chief Fire Officer, the introduction of fees for the service, and the conclusion of agreements with other fire services so as to render a more efficient fire service.

The Act is currently being reviewed, a process that is likely to result in a shift toward a greater emphasis on fire prevention and, given the pressures and demands resulting from global warming and climate change, more emphasis on the interface between the service and disaster management.

2.5 National Veld and Forest Fire Act (Act No. 101 of 1998)

The National Veld and Forest Fire Act (NVFFA) is one attempt on the part of government in South Africa to control wildland fires, and is administered by the Department of Agriculture, Forestry and Fisheries (DAFF).

The NVFFA is specific to wildland fires and outlines the responsibilities and mandates of both public and private bodies in respect of wildland fires, covering both their ignition and the conditions under which they are able to spread. The Act does this by providing, inter alia, for the establishment of Fire Protection Associations (FPAs) and the adoption of a fire danger rating system. It creates specific duties around fire prevention and fire fighting. It also provides for the designation by the Minister of a body as a fire brigade service. In some areas FPAs have been designated as this service.

2.6 National Environmental Management Act (NEMA) (Act No. 107 of 1998)

The National Environmental Management Act, which is administered by the Department of Environmental Affairs (DEA), provides for the management of natural resources. To the extent that many of our landscapes are fire-dependent and fire-adapted, wildland fires have a significant impact, both positive and negative, on natural resources, with the result that the Department has embarked on a wildfire management initiative under the umbrella of the Working on Fire Programme.

2.7 Municipal by-laws

Some municipalities have adopted by-laws that impact Integrated Fire Management. These include by-laws intended to address nuisances - including fires - and which provide a basis for dealing with properties that are infested with fire-prone material, and by-laws that restrict burning of open fires without a permit. However, in developing a sound Integrated Fire Management programme, various issues have emerged with municipal by-laws.

1. The failure of by-laws to provide adequate legal means for reducing fuel load on properties, particularly in the form of invasive alien vegetation.
2. There is often a conflict between municipal prohibitions on open fires and the need to conduct ecological burns in periods of relatively high fire risk.

2.8 Comment

The legal context is complex with overlapping mandates in some areas. If all the organs of state tasked with regulating and managing wildfires are capacitated and functioning, then wildfire management is a District Municipal competence. FPAs, acting within their fire management and business plans, policies, rules and regulations, are the primary institutions regulating the relationship between different landowners, whether private or public, and between landowners and regulatory bodies, but this must be affected within the framework set by other legislation.

CHAPTER **THREE**

LANDOWNERS AND FIRE





3 LANDOWNERS AND FIRE

3.1 Why should landowners look to manage wildfire?

It makes good business sense and landowners are legally obliged to do so.

Wildfires can cause extensive social, economic, and environmental harm. At a local level, individuals and communities feel this harm. To reduce this harm, the NVFFA creates various duties and obligations for landowners. Regardless of the legal obligations, however, a proactive approach to the management of wildfires can help reduce the harm, loss of productivity, disruption, and loss of opportunity that inevitably follows in the wake of an uncontrolled fire. This proactive approach lies in the adoption of an Integrated Fire Management system.

3.2 What are the legal duties of landowners in respect of wildfire prevention as detailed in the NVFFA?

Legally, the NVFFA imposes a number of duties on individual landowners that are intended to reduce the harm from wildfires.

- You may not start a wildfire (s 18(1)).
- You may only start a fire, including a cooking or braai fire, in a designated area.
- You must have equipment available to fight wildfires (s 17(1)).
- You must have trained personnel available to fight wildfires (s 17(1)).
- You must have a person on the property who keeps a lookout for fires (s 17(2)).
- You must establish a system of firebreaks (s 12).
- You may not burn firebreaks or carry out controlled burns when the Fire Danger Index is high or the FPA has objected to such burning taking place.
- You must manage the fuel load on land under your control. This means that you must remove invasive alien vegetation from the land, as well as other vegetation that creates unwanted fuel loads.

3.3 What is the presumption of negligence in relation to wildfires?

Section 34 of the NVFFA creates a presumption of negligence in relation to wildfires.

- If a person bringing a civil claim against a landowner proves that:
 - he or she suffered loss;
 - the loss was caused by a wildfire; and
 - the wildfire started on or spread from land owned by the landowner;
- The landowner against whom the claim is made is presumed to have acted negligently in relation to the wildfire unless:
 - the landowner proves that he or she was not negligent; or
 - the landowner is a member of an FPA in the area where the fire occurred, in which case the person bringing the claim must prove that he or she was negligent.

Clearly, the easiest way to avoid the presumption of negligence is to become a member of an FPA.



FPA's draw up fire management plans to minimise the fire risk on a landowner's property

3.4 FAQ: Why should landowners join an FPA?

Removing the presumption of negligence simply by being a member of an FPA provides a compelling reason to join an FPA. It is for this reason that insurance companies will often grant a rebate on premiums for those who are members of FPAs.

Added to that, landowners have to comply with the National Veld and Forest Fire Act whether they belong to an FPA or not.

FPAs help their members to fulfil their legal responsibilities by providing advice and guidance on how to reduce the wildfire risk. FPAs also help members by coordinating activities before, during, and after fires, and over the period of the fire season.

CHAPTER **FOUR**

FIRE PROTECTION ASSOCIATIONS





4 FIRE PROTECTION ASSOCIATIONS (FPA)

4.1 What is an FPA?

A Fire Protection Association (FPA) is an organisation formed by landowners to predict, prevent, manage, and help fight wildfires in an area in order to protect lives, livelihoods, property, and the environment. Further, it is an organisation that has been registered as an FPA by the Minister responsible for the administration of the National Veld and Forest Fire Act (Act 101 of 1998).

4.2 What is the role and what are the duties of an FPA?

According to the NVFFA, s 3(1) a Fire Protection Association must at meet at least the following minimum requirements.

- Develop and apply a wildfire management strategy for its area.
- Provide, in the strategy, for agreed mechanisms for the coordination of actions with adjoining Fire Protection Associations in the event of a fire crossing boundaries.
- Make rules to be lodged with the Minister, which bind its members and that provide for:
 - the minimum standards to be maintained by members in relation to all aspects of wildfire;
 - prevention and readiness for fire fighting;
 - controlled burning to conserve ecosystems and reduce the fire danger; and
 - any other matter which is necessary for the Fire Protection Association to achieve its objectives.
- Identify the ecological conditions that affect the fire danger.
- Regularly communicate the fire danger rating referred to in sections 9 and 10 to its members.
- Organise and train its members in fire fighting, management, and prevention.
- Inform its members of equipment and technology available for preventing and fighting wildfires.
- Provide management services, training and support for communities, in their efforts to manage and control wildfires.
- Supply the Minister at least once every 12 months with statistics about wildfires in its area.
- Furnish any information requested by the Minister in order to prepare or maintain the fire danger rating system.
- Exercise the powers and perform the duties delegated to it by the Minister.
- Appoint a Fire Protection Officer, unless a municipality is a member.

4.3 FAQ: Is the FPA a fire fighting force?

No. The NVFFA requires landowners to have enough trained staff and fire fighting equipment to stand a reasonable chance of preventing fires and stopping them from spreading to adjacent properties. Landowners have to comply with the NVFFA, whether they belong to an FPA or not. FPAs help their members to fulfil their legal responsibilities by providing advice and guidance about how to reduce the risk of wildfires. The FPA is a platform for landowners to coordinate efforts and share resources during fire incidents. In circumstances where there is no fire brigade service some FPAs have expanded their mandate to include this role.



A landowner's vehicle, fitted with fire fighting equipment

4.4 Who has a right and who is obliged to be a member of an FPA?

- All landowners in an area for which a Fire Protection Association has been registered have a right to join the Fire Protection Association, provided they undertake to abide by its constitution and rules (NVFFA 1998, s 4(6)).
- The owner in respect of State land must join any Fire Protection Association registered in the area in which the land lies (NVFFA 1998, s 4(8)).
- The municipality for the area in which an FPA is registered must become a member if it has a service (NVFFA 1998, s 4(7)(a)).
- Where there is a designated service in the area in which an FPA has been established, the designated service must become a member of the Fire Protection Association (NVFFA 1998, s 4(7)(b)).



Any landowner in an area for which an FPA has been registered has the right to join the FPA

4.5 FPA as a point of interface: who are the typical stakeholders in an FPA?

Ideally, FPAs are a membership-based organisation for landowners and land managers and a partnership forum to enable coordination between landowners and regulators as well as between landowners and wildfire and land management decision makers in the public sector.

The table below provides an overview of the typical stakeholders and the role of each in the business planning process. Members are as outlined above by the Act. Partners are other stakeholders with overlapping or related mandates.

Category	Description	Role
Private landowners	All private, community, and small industrial property owners who reside in areas which have regular wildfires, a risk of wildfire and relatively uniform climate/vegetation – organised into FMU and engaged via representatives.	Members
Large industry private landowners	Large-scale industry landholders who operate in areas that have fire risks.	Members
Public entities	Public entities with landholdings such as Eskom, Telkom, Transnet and SANRAL.	Members and Partners
Public landowners	All government departments and entities, which own land in areas, which have regular wildfires and/or a risk of wildfire.	Members
Conservation agencies	All conservation agencies (public and private) that own land in areas that have regular wildfires and/or a risk of wildfire.	Members and Partners
Communities and Traditional Leaders	Traditional leaders and rural communities that may be affected by wildfires.	Members and Partners
Local and District Fire Brigade Services	District and, where they exist and perform wildfire functions, local fire brigade services.	Member and Partner
Government departments	DAFF, DEA, Departments of Agriculture and Public Works.	Partners
Disaster Management	PDMC, District Fire Working Groups, District DM operation centres.	Partners
Organisations working with landowners	Institutions such as organised agricultural associations that represent members' interests or organisations such as insurance companies that service members.	Partners

4.6 What role do Fire Protection Associations (FPAs) play in the Wildland-Urban Interface?

Wildland fires do not respect boundaries. It is important that all landowners work together to manage them. The National Veld and Forest Fire Act enables landowners to form FPAs that are legal entities and provide an institutional structure, with various legal powers, within which wildfires can be managed. FPAs further provide a vehicle for improving communication between all landowners, local authorities, and the responsible national government departments that are engaging in the regulation and management of wildfires.

Communities living in the Wildland-Urban Interface, irrespective of whether their land is held in trust by the State or is privately owned, should become members of the local FPA. This is best resolved if the community has a committee that can represent it at the executive level of the FPA. In so doing the contribution made by the community to fire management in the area can be considerably expanded. At the same time the community will derive significant benefit from membership.

By working with surrounding communities Fire Protection Associations can strengthen their fire management efforts. Properties of private landowners and smaller communities border each other and through Fire Protection Associations the common goal of more effective fire management through improved practices can be achieved.

4.7 Informal Communities in the Wildland-Urban Interface and Fire Protection Associations

Wildfires occur throughout South Africa, from the savannahs in the west, throughout the vast grasslands in the hinterland, all the way to the threatened fynbos systems of the Western and Eastern Cape Provinces. Large communities, both urban and rural, are exposed to the destructive impacts of these uncontrolled fires. Livestock and valuable assets are lost, human casualties are inflicted and, all too frequently, lives are lost.



Informal dwellings destroyed in an uncontrolled fire

Developing populations have expanded into the natural areas and are increasingly exposed to wildfire hazards. Communities exposed to wildfires not only include poor rural communities, informal settlements, but also those living in upmarket developments. Many poor communities have a history of living with fire, using it for cooking, improving grazing, hunting, or clearing land. The lack of basic resources, however, has placed many of these communities at risk during the annual fire season.

There are initiatives to empower interested poor communities to take responsibility for reducing the risk of uncontrolled fires in their areas. This involves a collaborative planning process to transfer knowledge and skills on wildfire prevention, protection and response.

These communities are more than just places where people live, work and raise their children. They comprise and include the relationships, partnerships, attitudes and values binding people, businesses, organisations, and agencies that collectively motivate them to achieve common goals. A stable community provides a sense of security, serenity, comfort, and neighbourliness. Effective partnerships can resolve the challenges of dealing with poor communities in hazardous wildland and urban interface areas. The benefits of partnerships include the sharing of ideas, expertise, and knowledge, as well as the sharing of fire protection responsibilities.

These communities do not function in isolation. They border on, and simultaneously impact on, neighbouring communities that may be carrying out a variety of different activities, such as forestry or

agriculture. Very often they border on formally structured communities who already practice active wild-fire management. There may even be a registered Fire Protection Association in the area. It is important that these activities and communities be identified, that alliances are formed, and that effective, sustainable communities are established.

Most importantly, authorities, at both Local and District Municipality level, should be identified, included in, and notified of initial IFM objectives within these communities.

4.8 Who can register as an FPA?

According to the NVFFA, seven types of organisations may be registered as FPAs.

- A fire control committee or regional fire control committee established under section 19 of the Forest Act, 1984 (Act No.122 of 1984).
- A conservation committee established under section 15 of the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).
- A catchment management agency established under section 78 of the National Water Act, 1998 (Act No. 36 of 1998).
- Any nature conservancy established in terms of any ordinance of any Province.
- A fire protection committee established under section 7 of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).
- A disaster management agency established in terms of any law passed for the management of disasters.
- Any voluntary association in existence at the time of the promulgation of the NVFFA, which has as one of its objectives the prevention and combating of wildfires, or any committee of such an association.

**FACT
OR
FICTION**

Fact or fiction? A limited liability company can be registered as an FPA.

Fiction. As the NVFFA is currently formulated, it gives a detailed list of entities that may be registered as an FPA. They are either statutory bodies created in terms of other legislation or voluntary associations.

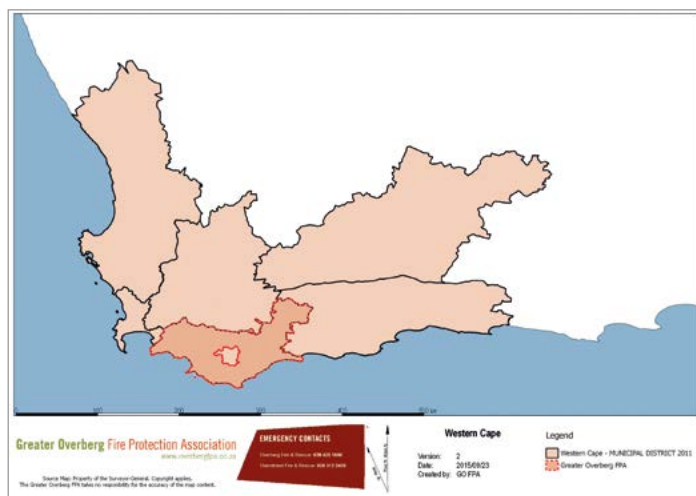
4.9 What is the ideal geographic scale for an FPA?

According to section 3(2) of the NVFFA an FPA may be established for an area that has:

1. regular wildfires; or
2. a relatively uniform risk of wildfire; or
3. relatively uniform climatic conditions; or
4. relatively uniform types of forest or vegetation.

The NVFFA does not expressly provide further criteria for delineating the boundaries between different FPAs.

Where all the stakeholders are operational, a consolidated offering is, as far as possible, recommended. There is good logic for aligning FPA boundaries with other administrative boundaries, whether



by district or local municipality, while having regard to vegetation type and commonality of risk. This facilitates a coordinated Integrated Fire Management strategy and the sharing of resources.

This configuration also opens up the possibility of FPAs exploring both grants-in-aid and sole-supplier agreements with District Municipalities to support FPAs.

LESSON ||

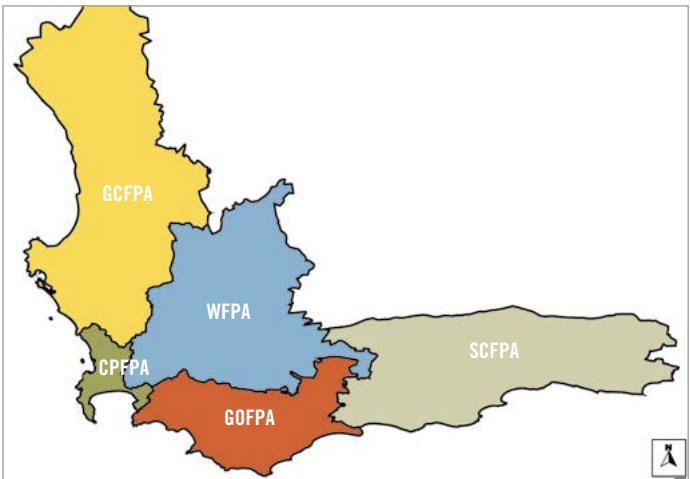
4.10 FPA boundaries

One size does not fit all. Integrated Fire Management requires differentiated institutional models. The model applied in a particular area will depend on the capacity of the State at a national, provincial and district level, the capacity of the private sector, as well as the nature of the terrain and the type of vegetation in the area. A review of FPAs across the country highlighted a range of possible permutations for an FPA structure. The capacity of the various fire brigade services, the landowners, and the partners all impact on the preferred institutional arrangements. But generally the rule seems to be that alignment either at municipal or district level is optimal.

CASE STUDY

In the Western Cape section of the Fynbos Biome, FPAs have been largely consolidated at a District level. This has been driven by:

- an acknowledgement of the central role of District Municipalities in wildfire management, in accordance with the legal mandates set out in the Structures Act;
- a willingness on the behalf of Chief Fire Officers of the District Municipalities to play an active role in the FPA, whether as the FPO of the FPA or not;
- the active involvement or commitment to be involved of disaster management, CFOs at district level, District Disaster Management Fire Working Groups, and the Western Cape Province Disaster Management team, and the need to align FPA activities with their activities;
- a view that where functioning fire brigade services exist, the primary functions of the FPA is risk management, fire management planning, and stakeholder mobilisation and participation; and
- a costing exercise that suggests a minimum number of FPA members is needed to constitute a financially viable and sustainable FPA, with capacity to offer the above services (minimum of 500 members and ideally more than 1 200 members).



Western Cape FPA boundaries

FACT

Did you know?

The NVFFA provides for exclusive territorial jurisdiction and does not allow for the boundaries of different FPAs to overlap. There can only be one FPA registered for a particular geographical area. Where two FPAs have registered for the same the geographical area the first registered FPA takes precedence.

4.11 How should an FPA be structured internally?

An FPA represents the point of interface between landowners and land managers managing fire-prone land. It also represents the point of interface between these landowners and land managers and government officials responsible for administering legislation regulating wildfire management. The structure of the FPA needs to take both these sectors into account and provide a vehicle to regulate the relationship between these groups.

The details of the structure will be informed by how the FPA is established and which of the institutional models, as outlined by the NVFFA, the FPA decides to follow.

LESSON II

4.12 What makes for a successful FPA?

The following factors contribute to the success of an FPA.

- An FPO or FPA Manager with excellent knowledge of the area, good relations with landowners, and a comprehensive understanding of the fire history of the area.
- An FPA that is responsive to the needs of landowners as well as the context in which they work. Where there are no functioning fire brigade services or where these services have limited capacity, FPAs have provided the service to members or have made it possible for members to access a service. Where the services exist, FPAs have been able to focus on more strategic functions and other aspects of Integrated Fire Management.
- A willingness and ability to work collaboratively with stakeholders and operate through a range of partnerships.
- A minimum scale to provide the services needed to enable the FPA to discharge its obligations in terms of the NVFFA, to assist landowners who are members to do likewise and, ultimately, to help landowners to better manage the risk of wildfires.
- Recognition of stakeholder fatigue arising from multiple forums and demands on their time and aligned meetings and services with disaster management and/or agriculture.
- Existence of dedicated capacity and clear directed leadership to function optimally.
- Excellent systems and good communication.



An FPA manager shares his knowledge of the area with landowners

4.13 How are FPA members organised?

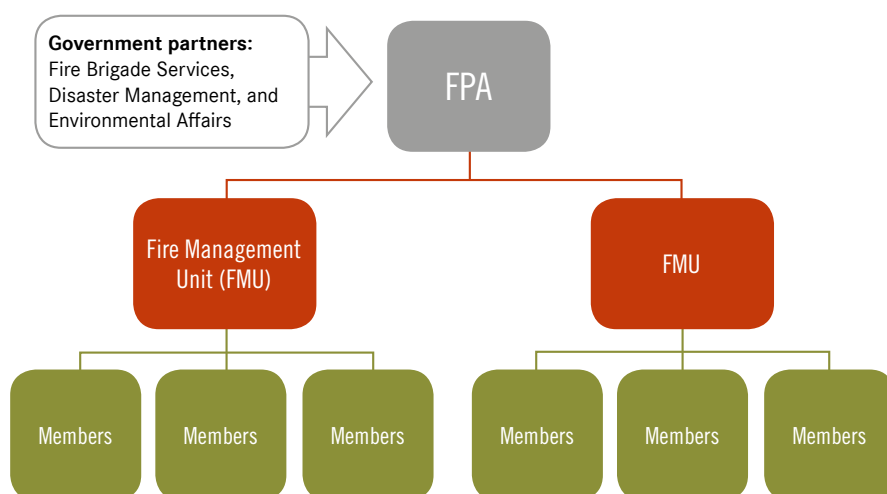
FPA members are often dispersed across a broad geographic area and there is a need for a localised and more personalised level of the membership organisation within the FPA.

4.13.1 Fire Management Units

Fire Management Units (sometimes referred to as wards or cells) organise smaller groupings of land-owners and divide the countryside into smaller geographical areas, thus making the physical and social characteristics easier to identify and manage. FMU boundaries should be aligned with local municipal boundaries or existing organisational structures such as conservancies and farmers' associations, farming types, and organic units based on communication and logistics.

 A *Fire Management Planning Guide* is attached.

The diagram below offers a useful model for thinking about a structure through which the individual members engage with the other different stakeholders.



The Fire Management Unit provides a local forum through which individual members can coordinate their response to fire management, share information, realign and establish firebreaks, pool fire suppression resources, and build fire-management capacity on the ground. A representative of each FMU should be part of the governance committee of the FPA.

4.13.2 What main role players does the law expressly provide for?

4.13.2.1 The Fire Protection Officer (FPO)

Every FPA must have a Fire Protection Officer whose role is prescribed in section 6(1) of the National Veld and Forest Fire Act. In terms of section 6(2)(a) of the NVFFA where a municipality is a member of the FPA and has a service, or where a designated service is a member, the Chief Fire Officer is the Fire Protection Officer, unless they decide to delegate this authority to another person. Where the post is vacant, or the incumbent chooses not to exercise his or her right, the members of the FPA may nominate a FPO who is then appointed and registered as such by the responsible minister.

The role of the FPO is outlined below.

- Perform the function of Chief Executive Officer of the FPA.
- Carry out the tasks assigned to him or her by the FPA or its Executive Committee.

- Take control of any fire fighting in the area for which the FPA has been formed, if:
 - the wildfire is a threat to life or property; and
 - they are reasonably able to do so.
- Enforce the rules of the FPA.
- Monitor and report, to the association and the Minister, on compliance with the NVFFA.
- Train the members of the FPA.
- Inspect the members' land to ensure that there is compliance with their duties and obligations in terms of the NVFFA and the rules and regulations of the FPA.

A CFO who assumes the role of the FPO, may delegate specific functions as defined above to the FPA manager or another person. For example, in the case of the Greater Overberg FPA, the CFO assumed the role of FPO but delegated the roles of the CEO of the FPA function to the FPA manager. In practice, this means that day-to-day prevention and mitigation falls under the purview of the FPA manager while the detection and suppression of wildfires falls under the CFO.

4.13.2.2 Chief Fire Officer (CFO)

According to the NVFFA, the Chief Fire Officer is the official responsible for and the head of fire services at local government level. In terms of the Municipal Structures Act, district municipalities are responsible for wildfire management and local municipalities for structural fires. This is not the case everywhere.

In practice, local and district government resources vary. In some areas, the Chief Fire Officer of the district is actively involved in managing fires while in others it falls to the local municipality. In some places, the Chief Fire Officer actively manages a highly resourced service. In others, the positions are vacant or the service is either under-resourced or, in some instances, non-existent.

Where the post is filled and the service is active, best practice suggests the Chief Fire Officer of the District Municipality should:

- be a member of and attend all FPA meetings (it being assumed that the FPA operates at a district level);
- assume the formal role of FPO (if it is not to be assumed it must be formally delegated to another nominated person);
- nominate an official of the service to attend any Fire Management Unit meetings; and
- delegate the activities outside of suppression and enforcement to the FPA manager.

FACT

Did you know?

The Municipal Structures Act (Act No. 117 of 1998) provides the appropriate division of functions and powers between categories of municipalities as indicated below.

83. (1) A municipality has the functions and powers assigned to it in terms of sections 156 and 229 of the Constitution.
 - (2) The functions and powers referred to in subsection (1) must be divided in the case of a district municipality and the local municipalities within the area of the district municipality, as set out in this Chapter.
84. (1) A district municipality has the following functions and powers:
 - (a) Integrated development planning for the district municipality as a whole, including a framework for integrated development plans for the local municipalities within the area of the district municipality, taking into account the integrated development plans of those local municipalities.
 - (j) Fire fighting services serving the area of the district municipality as a whole.

4.13.2.3 FPA Manager

FPA members are mainly landowners with multiple responsibilities. This generally means they have limited time to service the FPA outside of their legal responsibilities as a landowner. This has resulted in the appointment of FPA managers on a part or full-time basis to drive the FPA programme and mobilise and work with members.

Where FPA managers exist, the FPA Governing Body appoints them, whether it is a board or a committee, and they have the following functions:

- a. coordinating the activities of the FPA and reporting to the FPA Governing Body;
- b. facilitating the activities of members, through the Fire Management Units;
- c. managing partnerships and external relations; and
- d. fulfilling any functions of the FPO that are delegated to them.

The table below provides a recommended division of responsibilities for IFM, assuming the state has an appointed CFO and capacity, the CFO is the FPO and delegates some of the role of FPO to the manager, and a FPA manager is in place.

	Chief Fire Officer	Fire Protection Officer	FPA manager
Risk assessment	Fire ecology, history and behaviour. Proper mapping to inform decision-making. Quantification of risk – social, environmental and economic.	Proper mapping to inform decision-making. Quantification of risk – social, environmental and economic.	Capacity and resource audits.
Stakeholder organisation	Fire-awareness information.	Enforce the rules of the association.	Fire-awareness information. Mobilise landowners into the FPA. Enforce the rules of the association.
Fire management planning	Responsible for Disaster Management Strategy and the fire component of this.	Ensure that an IFM strategy is in place. Fire prevention actions and support. Powers of arrest, search, and seizure to enforce the NVFFA.	Develop and apply the IFM strategy for the region. Assist members with fire management planning to prevent or minimise the impact of wildfires. Consult with Municipalities and Fire Brigade Services in the development and application of the IFM strategy.
Detection and suppression	Provide Fire Brigade Services to assist with the suppression of fires.	Take control of any wildfire fighting if the fire is a threat to life and property. Train members in the law, prevention, management, and control of fires as well as the rules of the FPA.	Inform members of equipment and technology available for preventing and fighting fires. Organise the training of members in fire fighting, management and prevention. Be part of the ICS team engaged in the coordination of stakeholders.

	Chief Fire Officer	Fire Protection Officer	FPA manager
Rehabilitation	None	None	Facilitate engagement with relevant role players, particularly in government, on behalf of members. Landowners are responsible for land management and rehabilitation in terms of CARA.
Record-keeping and Monitoring & Evaluation	Records of all fire suppression actions and of all disasters.	Monitor and report on compliance with the NVFFA to the FPA and the Minister.	Apply systems to enable the proper functioning of the FPA. Furnish the Minister with information to prepare and maintain the fire danger rating system. Supply the FPO and Minister with wildfire statistics and other relevant information.

4.13.2.4 Appointing an FPA Manager

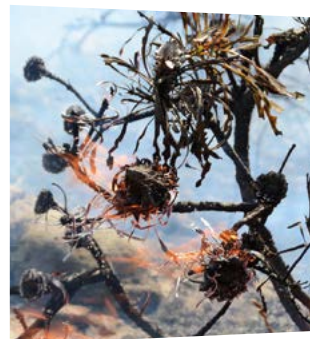
Practice has shown that an FPA requires dedicated management capacity in order to be effective.

According to the governance provisions above, FPA Managers report to the Chairperson of the FPA and to the local authority CFO, and should do so on a monthly basis at least to both. These are two of the many relationships that need to be effectively managed by the FPA manager in order to ensure the success of the FPA.

The following are some of the key deliverables generally required of an FPA Manager.

- 1) For an FPA in the process of establishment, formalise the FPA including:
 - a) finalising the Constitution and Memorandum of Incorporation (MOI);
 - b) finalising rules and regulations for the FPA;
 - c) facilitating the process of the establishment of the FPA executive and board;
 - d) starting the application process for non-profit organisation (NPO) status;
 - e) recruiting additional staff as funding becomes available; and
 - f) developing and agreeing on the service offering to members.
- 2) Assist and work with the operational support staff to:
 - a) complete the application to DAFF for the establishment of the FPA and then dealing with DAFF in regard to its annual requirements;
 - b) communicate with the prospective members to ensure they are aware of the process and how it will impact on them;
 - c) prepare newsletters;
 - d) establish and manage a FPA website; and
 - e) consolidate and update the member database.
- 3) Work with the Treasurer and auditors to:
 - a) establish or revise proposals on the FPA fee structure;
 - b) update and revise the FPA budget;
 - c) facilitate the sending out of annual invoices;

-
- d) assess the funding requirements for the full staffing team and assist with raising funds for this team; and
 - e) attend to matters relating to the registration of the FPA name with SARS, registration with CIPRO, and other related administrative functions.
- 4) Facilitate the establishment of Fire Management Units and area management units, with a view to establishing wall-to-wall Fire Management Units.
 - 5) Build the FPA including:
 - a) working with neighbouring FPAs; and
 - b) managing recruitment of additional FPA members to increase membership to the desired 75% coverage.
 - 6) Ensuring an up-to-date:
 - a) map of the area;
 - b) database of FPA membership; and
 - c) database of resources available.
 - 7) Assisting members with arrangements for fire fighting training, and rolling out a training programme for the area.
 - 8) Maintaining a firebreak network database.
 - 9) Assisting members with the application of burning permits, firebreak specifications, and identifying areas where fuel reduction is required.
 - 10) Establish or update the FPA Integrated Fire Management plan including an audit of FPA resources and gaps. To undertake this the auditor/consultant must:
 - a) ensure that the area is mapped and captured in ArcView and Google Earth;
 - b) ensure the database of membership and landholding is up-to-date and captured in a programme that can interface with ArcView and Google Earth;
 - c) establish a mapping layer showing risk; and
 - d) hold management unit meetings to revise and update the fire plan, for presentation to the Governing Body annually for approval.
 - 11) Mobilise resources and multi-stakeholder engagement in IFM including:
 - a) compiling funding applications to the UFPA and Working on Fire (WoF) for the management posts;
 - b) facilitating the relationship and collaboration between the FPA and the District Municipality Fire Working Group to ensure maximum integration;
 - c) facilitating the relationship and partnership between the FPA and the various agricultural associations;
 - d) facilitating the relationship and partnership between the FPA and conservation agencies;
 - e) mobilising and facilitating resources for fuel-load reduction; and
 - f) mobilising other resources to secure the financial sustainability of the FPA.
 - 12) Attend meetings of the Provincial FPA.
 - 13) Ensure regular reporting to:
 - a) the Governing Body of the FPA; and
 - b) the Department in terms of the NVFFA.



4.13.3 Governance

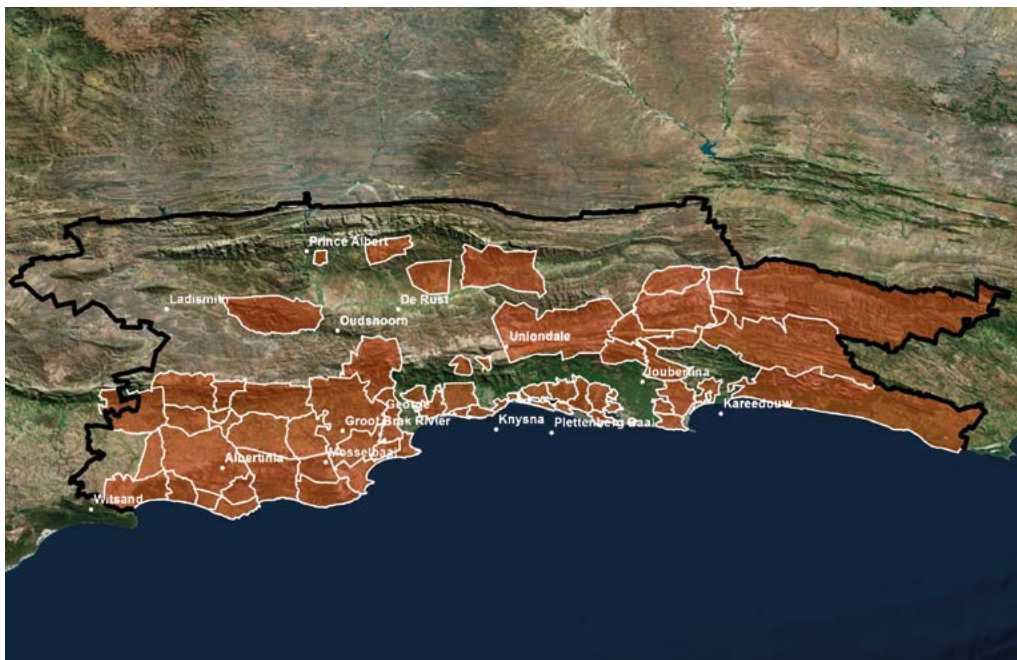
4.13.3.1 How is the FPA governed?

As a legal entity, whether or not it is established as a voluntary association or non-profit organisation (NPO), an FPA needs to comply with standard good-governance practices as outlined in the King Commission Report. This is particularly important if FPAs are hoping to be recipients of either government or donor funds.

4.13.3.2 Independent Governing Body

In terms of these standard governance practices, each FPA needs:

- an independent Governing Body, nominated and elected by its membership, that is responsible for overseeing the functioning of the FPA;
- staff members employed for the day-to-day management of the FPA who are accountable to the Governing Body but who are not represented directly on the Governing Body; and
- persons in oversight positions (but they may not be paid officials of the same institution).



Fire Management Units in the Southern Cape FPA

4.13.3.3 Landowner representation

Given the objective of achieving wall-to-wall FPAs, it is desirable that within FPAs there are wall-to-wall FMUs, and that there be adequate representation of each of the FMUs on the Governing Body. Representatives should be members of the FPA.

However, it is also necessary to ensure that the Governing Body is able to exercise effective oversight. A bloated Governing Body often results in Governing Body members failing to take governance responsibility. As a rule of thumb, it is recommended that a Governing Body should not exceed ten members. In order to achieve effective governance, it is recommended that different FMUs be conglomerated. Where the FPA is structured at a district level, this conglomeration may be according to municipal areas with one representative for each municipal area or by land use with representatives by land use on the FPA Governing Body.

Case studies on membership models

Lowveld and Escarpment FPA (LEFPA)

The Lowveld and Escarpment Fire Protection Association (LEFPA), registered in 2004 in terms of the *National Veld and Forest Fire Act*, is one of the more established FPAs in South Africa. LEFPA has about 600 members, with combined land holdings of about 980 000 hectares in a total area of 1.8 million ha. All the large corporate growers as well as commercial farmers, municipalities, and the Mpumalanga Tourism and Parks Board are members. The forestry companies play a leading role in LEFPA, contributing the bulk of the funding and strategic management input. They also represent 46% of the landholdings under LEFPA.

In order to protect the interests and investment of larger landowners, the FPA has categorised membership into four categories namely forestry industry, agriculture, conservation, and municipal/residential. Each group is afforded votes on the Governance Body. In this way the FPA has been able to ensure the larger landowners, representing the bulk of hectares under the FPA, are not outvoted by smaller members' interests. As forestry represents the largest landholdings, it has two votes and each of the other categories has one vote.

Greater Overberg FPA (GOFPA)

The GOFPA established in 2014 has a few hundred members. Most of the members are farmers. It has organised these members into geographically defined Fire Management Units. These are largely aligned with municipal areas. Each FMU has a representative and vote on the FPA Governing Body to ensure each unit has equal say in all decisions.

4.13.3.4 Government officials

As far as government officials responsible for regulating legislation are concerned, the Chief Fire Officer has various roles and responsibilities in terms of the *National Veld and Forest Fire Act*, the *Fire Brigade Services Act* and the *Disaster Management Act*, and the fire advisor of the Department of Agriculture, Forestry and Fisheries has responsibilities for the administration of the *National Veld and Forest Fire Act*.

To facilitate the partnership, it is recommended that one government official from each department responsible for regulating wildfires, needs to be represented on the Governing Body (i.e. DAFF, CFO for Disaster Management and Wildfires at the Municipality and DEA).

Government officials responsible for implementing legislation relating to the regulation of wildfires should not serve on the FPA in an executive capacity but should rather be *ex officio* members of the Governing Body of the FPA.

In some instances the fire advisor employed by DAFF, who is responsible for the implementation of the NVFFA, also serves in a management capacity within the FPA. Unless the FPA structures are internalised within government, such a dual role is likely to give rise to a conflict of interest. In such circumstances, the responsible official should rather serve as an *ex officio* member of the Governing Body of the FPA and abstain from voting on any decisions by the Governing Body.



Working on Fire firefighters



Working on Fire aerial support

4.13.3.5 The Working on Fire Programme

The government assists with the management of wildfires through the Working on Fire programme, which is under the jurisdiction of the Department of Environmental Affairs and administered by a private entity contracted to government for that purpose. A large part of the business of the FPA involves managing the relationship between the FPA and the Government's WoF Programme, as well as exercising a degree of oversight over its implementation. Concerns have been expressed about potential conflicts of interest that arise if officials funded by WoF are also responsible for this oversight. No members of the Governing Body should be remunerated in any way through the WoF programme. However, it is recommended that a representative of WoF should participate in every meeting of the Governing Body as an observer and provide assistance to the FPA in accordance with the planning and resources of the WoF Programme.

4.13.3.6 FPA structure



LESSON

Lessons: Optimising FPA governance

The following is a list of recommendations extracted from best practice around the country and is intended to help FPAs function better within a complex legislative and institutional context.

- FPA meetings and District Fire Working Group meetings, convened in terms of the Disaster Management Act, should be integrated into a single meeting convened on a quarterly basis, and the activities of the Provincial UFPA and the Provincial Fire Working Group should be similarly integrated.
- Bilateral agreements should be concluded between individual FPAs and the relevant district and local municipalities, setting out the roles and responsibilities of CFOs (either as CFOs or as FPOs), FPAs and FPA managers and associated funding flows.
- FPA Managers have dual lines of reporting to the Chairperson of the FPA and to the CFO of the district.
- Where local government has functioning fire brigade services, the key role of an FPA is aligned with the functions outlined in the NVFFA, namely risk management. Where FPAs develop suppression capacity, either indirectly through members or directly through the FPA itself, this capacity has to be managed subject to the overriding legal powers and control of the CFO (either as CFO or as FPO).
- All government funding for Integrated Fire Management needs to be aligned with and used to incentivise membership of FPAs.
- In order to ensure that landowners and land managers are actively engaged in the FPA and to reinforce the importance of the FPA as a membership-based organisation rather than an entity of the State, it is proposed that the Governing Body be chaired by a landowner or land manager and not by the Chief Fire Officer or other official responsible for regulation.

4.13.3.7 FPA constitution

Every FPA is required to draft a constitution and a business plan to govern its activities. The constitution needs to include provisions for the structuring of the FPA, its geographic scope, duties, membership and executive functioning.



These are outlined in the *FPA Model Constitution* template attached.

4.13.3.8 FPA rules

In addition to the constitution, several FPAs have also developed rules to guide the day-to-day operations and activities of its members prior to and during fire season. The National Veld and Forest Fire Act 101 of 1998 (chapters 4 and 5) guides the rules and minimum requirements for members.

Below are some of the key areas that the FPA rules need to cover:

- a. Members' duties in IFM around prevention, mitigation, detection, and suppression;
- b. Members' FPA related duties;
- c. Members' prohibitions;
- d. minimum standards for compliance; and
- e. liabilities.



A set of *FPA rules*, adapted from the rules of the Southern Cape FPA, is attached as an example.

4.14 Membership administration

Each FPA offers tailored services. Member benefits vary depending on these services. Some of the specific benefits are linked to fire prevention and suppression services.

4.14.1 Membership recruitment

However, there is a range of others. The list below provides some generic benefits:

- a. providing fire awareness information and materials;
- b. managing the relationship with government and other role players and lobbying for support, equipment and coordination;
- c. improved coordination of fire management in your area;
- d. providing subsidised training in fire fighting for members;
- e. providing information on fire danger warnings and wildfire activity; and
- f. communicating members' needs and concerns to umbrella bodies.

Being clear on the benefits of the FPA is essential when recruiting potential members who want to know why they should join the FPA and what benefits it will afford them.

4.14.2 Membership application forms

Once the hearts and minds battle has been won and landowners have agreed to join an FPA, the next challenge is ensuring that there are systems for managing members efficiently and effectively. This starts with ensuring the right information is collected upon registration, including property information, landowner contact details, and available resources.



See the *Pro-forma membership application form* for details.

4.14.3 Membership fees

Most FPAs are reliant on membership fees to provide the necessary services and benefits to members. Across the country FPAs have pegged their fees at different levels using different methodologies and systems.

Most FPAs charge a joining fee, almost like an administration fee when members join. If membership is suspended due to non-payment of fees and the person wishes to reinstate membership, this fee is again payable.

Annual fees are also paid. The most common ways of structuring annual fees are:

- a. a per hectare rate with a **minimum threshold** (see LEFPA);
- b. a flat rate for different categories of land-holdings (see SCFPA); and
- c. a flat rate per landowner.

FPA fees also vary based on the services offered. Some FPAs have linked their fees to services with scaled rates linked to levels of services needed.

LEFPA and SCFPA membership

LEFPA has tiers of fees according to the type of protection required – most members are basic members.

Membership Tier	Benefits	Fee
Basic Members	Access to the Working on Fire Teams. No access to any Aerial Resources. Discounted rates on training.	Per hectare rate with basic minimum fee.
Aircrafts	First-call status on Spotters and Helicopters (Will also have second-call on fixed wings).	A higher per hectare rate and minimum fee.
Fixed Wing – Second call	Second call on fixed wing bombers (available to Helicopter members).	An even higher per hectare rate.
Fixed Wing	First-call status on Bombers as well as Helicopters	A per hectare rate with a minimum fee.

SCFPA has a flat rate for different categories of landholdings under a certain amount of hectares, and then a per hectare rate for private landowners, scaled flat rates for commercial and gated estates, and a flat rate for government as detailed below.

Private landowners		Gated estates	Commercial landowners – forestry/ tourism/ industry	Government/ Conservation
<25 ha	Min flat fee	Scaled flat rate based on size, which is a lot higher than private or commercial.	Scaled flat rate between private and gated based on size of land holdings.	Flat rate regardless of size.
25-50 ha	Min flat fee			
50-100 ha	Min flat fee			
100-300 ha	Higher flat fee			
300-500 ha	Per hectare rate			
500-1000 ha	Per hectare rate			
1000-2000 ha	Per hectare rate			
>2025 ha	Per hectare rate			
SOE land	Per hectare rate			
SOE servitude	Per hectare rate			

CHAPTER FIVE

THE LEGAL PROCESS FOR SETTING UP AN FPA





5 WHAT IS THE LEGAL PROCESS FOR SETTING UP AND REGISTERING AN FPA?

The Department follows a two-phased approach in registering an FPA. The initial phase enables the Department to ensure that, broadly speaking, the FPA has the support of owners and its boundaries make sense. The subsequent phase, which entails a lot more work, deals with the formal requirements that must be met to ensure that the FPA is properly structured and is likely to be functional.

For more information see the FPA registration letter and information pack from DAFF.

FACT

Did you know?

The NVFFA only provides for exclusive territorial jurisdiction and does not allow for overlapping FPA boundaries.

5.1 What does the Department require in the initial phase of setting up an FPA?

To set up an FPA, first engage with the Department fire advisor and establish whether or not an FPA exists for the area. If not, decide whether:

- a. the boundaries of another FPA are to be expanded to incorporate the proposed area (see the procedure set out below); or
- b. a new FPA is to be registered.

If a new FPA is to be registered:

- obtain *Form 1 - Application for registration of a fire protection association Part 1* 
- and *Guidelines to Assess form 1*  and
- obtain advice of the Fire Advisor on completion of Form 1.

Convene a meeting of interested parties at which it is necessary to:

- adopt a resolution, in principle, that an FPA is to be established;
- adopt a proposed name for the FPA that is unique within the metropolis or district;
- decide on the proposed members;
- appoint an interim convenor; and
- decide on the boundaries of the proposed FPA.

Complete Form 1, submit to, and obtain the approval of the Chief Fire Officer.

The Chief Fire Officer must then:

- evaluate Form 1;
- make a recommendation to the Department Head Office; and
- forward the documentation to Head Office for final approval.

The Department will assess the completed Form 1 to determine if:

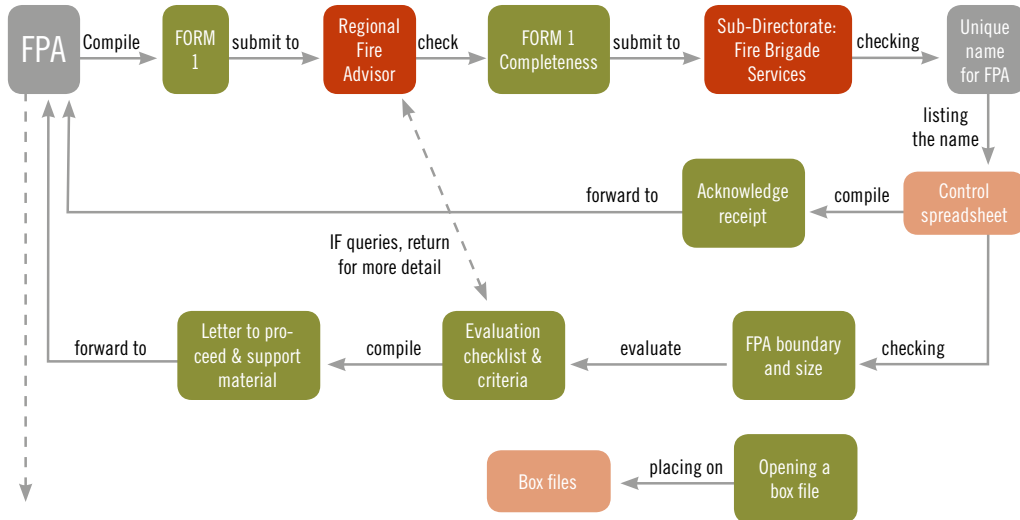
- the FPA's name is unique within its metropolis or district;
- no owner has been deliberately excluded from discussions about setting up the FPA;
- the boundaries:
 - are suitable with regard to the requirements for veldfire management in the area;
 - allow owners to organise effectively; and
 - have been chosen in the interests of the population as a whole within the metropolis or district.
- no other FPA exists or is planned within the area;

- the chief fire officer (CFO) approves (if one or more exist); and
- the Departmental regional representative or Fire Advisor recommends that the registration should proceed.

If approved, the Department will:

- enter the name of the proposed FPA onto a database; and
- advise the Fire Advisor who must inform the proponents that the FPA can proceed with incorporation.

BUSINESS PROCESS: INTENTION TO REGISTER AN FPA



5.2 What does the Department require in the second phase of setting up an FPA?

Once notice has been received from the Department of the approval of Form 1, the proponents of the FPA must follow certain steps.

STEP 1: Engage with the Fire Advisor around the completion of *Form 2 – Application for the Registration of a Fire Protection Association and for the Registration of the Fire Protection Officer* - and prepare the following documentation:

- a draft constitution setting out proposed structure of the proposed FPA;
- a draft map of the proposed FPA;
- a draft business plan which includes the veldfire management strategy; and
- the draft rules of the FPA.

STEP 2: Engage with the CFO, if there is one, to decide:

- who will be the FPO; and
- if the CFO is to be the FPO, whether any powers are to be; and
- notify interested parties of the date of the proposed founding meeting.

STEP 3: The proponents of the FPA must constitute the founding meeting of the proposed FPA at which it is necessary to:

- a. take an attendance register of those present;
- b. keep minutes;
- c. adopt specific resolutions relating to the following:
 - i. adopting the constitution of the FPA;
 - ii. approving a map of the area of the FPA;
 - iii. appointing the FPO;
 - iv. approving the business plan of the FPA, which includes the wildfire management strategy; and
 - v. approving the rules of the FPA.

STEP 4: Following on from the founding meeting, attend to internal management, including:

- a. opening a bank account for the FPA;
- b. embarking on FPA management pending registration; and
- c. completing Form 2.

STEP 5: Commence registration process with the Department by sending a letter to the Fire Advisor enclosing the following:

- a. Form 2, duly completed;
- b. minutes of the founding meeting;
- c. copies of the following documents:
 - i. the resolutions adopting the constitution, the boundaries of the FPA, the business plan and the rules of the FPA;
 - ii. the constitution of the FPA;
 - iii. a map of the boundaries of the FPA;
 - iv. the resolution relating to the appointment of the FPO;
 - v. the business plan, which includes the wildfire management strategy; and
 - vi. the rules of the FPA.

The Fire Advisor must consider the documentation and make a recommendation to the Department, acting on behalf of the Minister.

The Minister must consider Form 2 and the supporting documentation, including the recommendation of the Fire Advisor, and decide whether the FPA will be registered. An FPA will be registered if it is capable and representative.

In order to determine the capability of the candidate FPA, the Minister will consider the contents of the business plan to see the following:

- the degree to which the wildfire management strategy addresses the wildfire risk in the FPA's area;
- the fitness of the rules;
- the resources available to the FPA including support from an umbrella FPA;
- evidence of co-operation between the FPA and the CFO;
- evidence of support by the municipality for the FPA;
- the competency of the FPO; and
- any other information that the minister deems relevant information.

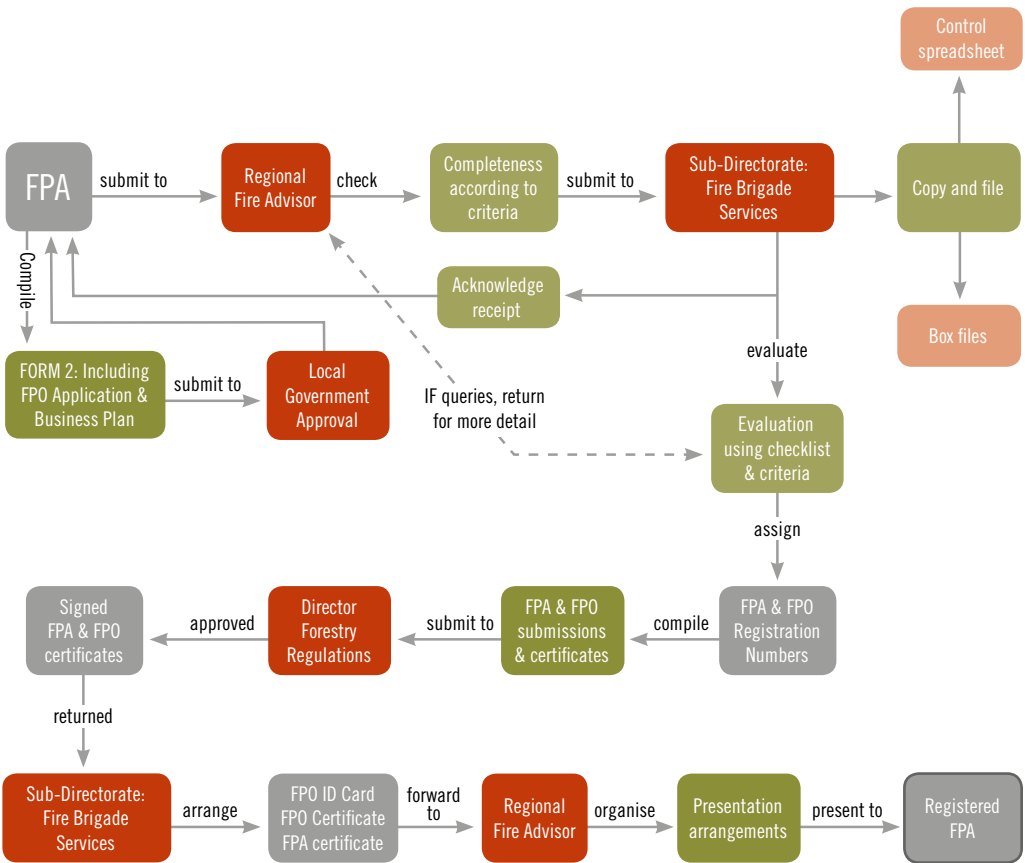
In order to determine the representivity of the FPA, the Minister will consider:

- the proportion of the area of the FPA represented by the FPA;
- any objections made to the FPA's establishment;
- any evidence of the exclusion of an owner or category of owner;
- any evidence that vulnerable owners or assets have been unreasonably excluded; and
- any other relevant information.

The Minister may decide along the following lines.

- 1) Refuse to register the FPA, in which case he or she must state in writing within a reasonable time the reasons and steps that can be taken to rectify any shortcomings.
- 2) Refuse registration until the FPA has fulfilled certain conditions, in which event the Department must:
 - a. inform the FPA in writing of the conditions to be fulfilled;
 - b. once the conditions are fulfilled:
 - enter the FPA into a register; and
 - issue a registration certificate and number.
- 3) Register the FPA without conditions, in which case the Department will:
 - a. enter the FPA in a register;
 - b. issue a registration certificate and number; and
 - c. notify FPA and Fire Advisor of registration.
- 4) Register the FPA, but subject to certain conditions that must be fulfilled after registration, the Department must:
 - a. enter the FPA into the register and issue a registration certificate and number;
 - b. inform the FPA of the conditions and the time period within which it must fulfil them; and
 - c. If the FPA fails to fulfil the conditions, it must be deregistered after being given a reasonable opportunity to remedy its failure.

BUSINESS PROCESS: FPA AND FPO REGISTRATION



LESSON II

What has been learnt about setting up FPAs?

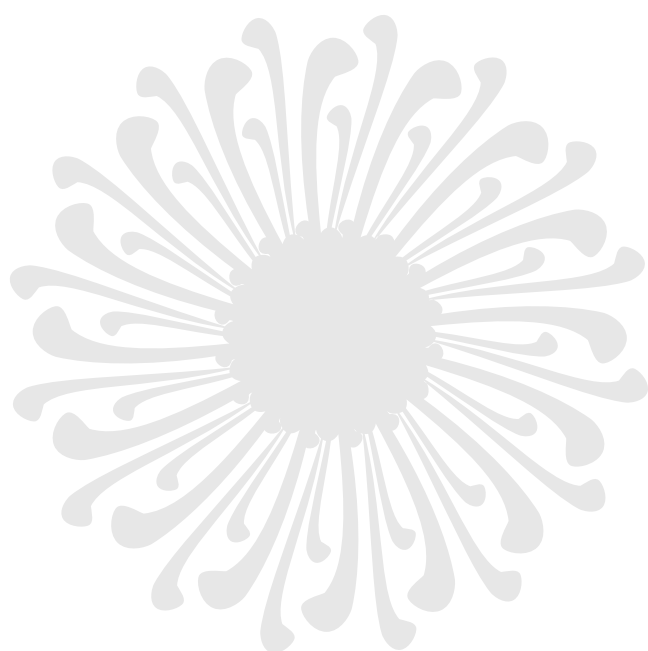
1. It takes time to jump through the legal hoops.
2. It takes time for public sector bodies to commit time, resources, and even sign up as members.
3. You need to have a clear plan to sustain interest and membership.
4. Success in responding to a fire and in preparing for a fire season are the best mobilisers of private landowners.
5. Frequent and relevant communication with members is key.

Did you know?

There are additional requirements of the Department relating to the business of the FPA.

- If the boundaries of an FPA change,  *Form 3 – Notification of a Change in the Boundaries of a Fire Protection Association* - must be completed and submitted to the Department.
- If the Executive Committee of an FPA changes, *Form 4 – Notification of a Change in the Membership of the Executive Committee of a Fire Protection Association* - must be completed and submitted to the Department.
- If a new FPO is appointed for an FPA, *Form 5 – Notification of the Appointment of a New Fire Protection Officer* - must be completed and submitted to the Department.





CHAPTER SIX

THE LEGAL PROCESS FOR DEREGISTERING AN FPA





6 WHAT IS THE LEGAL PROCESS FOR DEREGISTERING AN FPA?

6.1 Deregistration at the instigation of members

Should the members of an existing FPA wish to deregister the FPA, the following is required:

- a legal quorate meeting of the FPA must be convened;
- at the meeting:
 - a record of attendees to be kept;
 - a resolution to de-register the FPA must be adopted, which must state:
 - the FPA name;
 - resolve the Minister be required to deregister the FPA;
 - provide the reasons for the de-registration; and
 - indicate what will happen to the assets of the FPA upon de-registration;
- the resolution and record of attendees must be submitted to the Department for approval.

6.2 Deregistration at the instigation of the Department

Without being requested to by the members, the Minister may decide to deregister an FPA if:

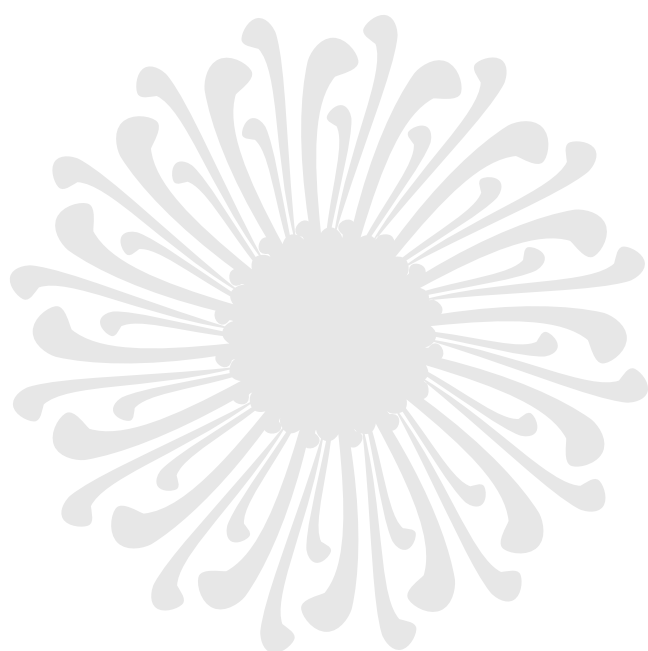
1. the FPA has failed to deliver an annual report for two successive years; and
2. the FPA is unable to execute its duties required by section 5 of the Act.

Regulations set out process by which deregistration will happen.

6.3 Process following on the decision of the Minister to deregister an FPA

If the Minister decides to deregister an FPA the Department will:

- inform the FPA in writing of its deregistration;
- record the deregistration in the register of FPAs; and
- withdraw the FPA's registration certificate and number.



CHAPTER SEVEN

RESOURCING AN FPA

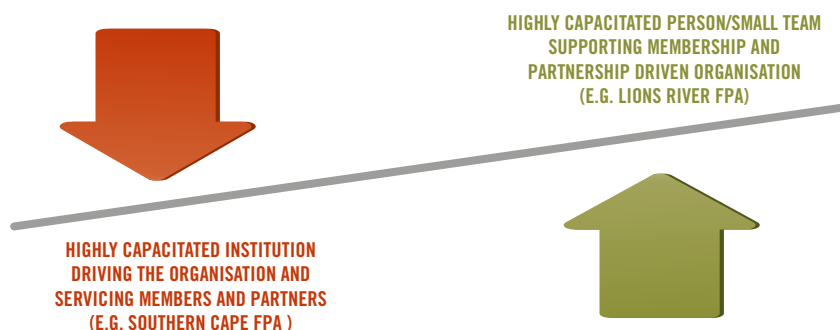




7 RESOURCING AN FPA

7.1 FPA management models

FPA's are resourced in different ways. A review of FPA's globally and across South Africa provides a spectrum of options for resourcing FPA's ranging from a lean small management team with the activities of the FPA largely driven by the membership to a large well-resourced institution driven by staff capacity.



Given the global and local financial situation, pressures on government resources and the challenges of sustaining the human capital required to drive Integrated Fire Management, leaner structures are likely to be more prolific and, to secure the longer term sustainability of Fire Protection Associations, should be encouraged.

CASE STUDY

Case study

The Lions River FPA employs two people part-time. One is the FPA manager, a highly skilled, natural resource manager, and formally registered as Fire Protection Officer (FPO) in terms of the legal requirements of the NVFFA. The position of FPO manager is remunerated by the FPA. However, as the FPA cannot afford to fund a full-time post, he is engaged for 30-40% of his time. The amount of time given by him to the FPA increases during fire season. The other person is a part-time secretary who manages the database and attends to administration. Other resources are either contracted in or supplied via volunteers (local farmers/landowners). This model is lean but with a high level capacity.

At the other end of the spectrum - in the Southern Cape FPA - the DAFF Fire Advisor serves as the General Manager of the FPA. The position is funded by DAFF. He has a complement of 12 staff members. The FPA directly employs or co-funds five staff members consisting of two area managers, two administrators and a GIS person. The office has three Global Environmental Facility (GEF) funded positions: an operational support and communications person and two Extension Officers. There are various Working on Fire operational staff members responsible for managing WoF teams and aerial resources. The office would like to employ a further three people to serve as the base manager's supervisor, an operational manager, and an additional operational support person.

7.2 Financial reporting requirements of the Department

The Department requires that:

- FPA financial years run from 1 April to 31 March; and
- Annual reports of FPA's including annual financial reports must be submitted to the Department by 30 June every year.

7.3 Finances

How FPAs are financed varies depending on the role and services of the FPA, its capacity, its partnerships, and the available resources of members. Based on a review of functioning FPAs, an annual budget of at least R350 000 is needed to run an FPA. This fee should be largely recoverable from membership fees.

Item	Quantity	Monthly Cost	Annual Total	Budget Total (ideal)	Budget total (min)
Staff				R 888 000	R 252 000
Manager	12	15 000	180 000		180 000
Area manager	12	10 000	120 000		
Area manager	12	10 000	120 000		
Area manager	12	10 000	120 000		
Administrator/GIS	12	6 000	72 000		72 000
Administrator	12	8 000	96 000		
Operational and Communication support	12	15 000	180 000		
Administration				77 000	22 000
Postage	1	1 000	1 000		
Telecommunications (manager)	12	1 500	18 000		18 000
Telecommunications (3 x area managers)	12	3 000	36 000		
Office	12	500	6 000		
Catering budget	6	1 000	6 000		
Stationary	12	500	6 000		500
Audit fee	1	3 000	3 000		3 000
Banking Charges	1	1 000	1 000		500
Marketing				16 000	6 000
Advertising	1	10 000	10 000		
Website	12	500	6 000		6 000
Transport & Logistics				108 000	36 000
Fuel, and S&T	12	3 000	36 000		36 000
Fuel, and S&T	24	3 000	72 000		
Vehicle	0	10 000	0		
Training				80 000	20 000
Training of members	1	80 000	80 000		20 000
Fire Management Plan					20 000
Development of Fire Management Plan	1	100 000	100 000		20 000
Other Commitments				11 000	10 000
UFPA	1	10 000	10 000		10 000
Insurance	1	1 000	1 000		
Total Expenditure				R 1 180 000	R 366 000

As an FPA expands the basket of services it provides, so its budget needs to increase. This is evidenced in the varying guideline budget above, which can increase as much as three-fold, depending on the level of service supplied.

FACT

Did you know?

The SCFPA has the largest budget of any FPA in the country. In 2014, it was around R3-million, 50% of which was covered by membership fees and partner contributions. LEFPA, which has large commercial interests and contributions, had, in 2014, a budget of approximately R2-million, entirely funded by members.

7.4 Funding

Possible sources of funding for FPAs are detailed in the table below with links to examples of FPAs who have sourced such funding.

Funding source	Implications for FPA activities	Example
Disaster Management	Need to provide a service to disaster management.	SCFPA has a sole provider agreement with Eden District Disaster Management and receives funding for wildfire management services. In addition, SCFPA has provided non-fire related services to Disaster Management in, for example, the event of a large oil spill.
Local Government	FPA must perform a function government recognises.	LRFPA has a grant-in-aid agreement with the Lions River Municipality and receives funding for assisting with wildfire management.
Management Fees	FPA can implement a programme for government or the private sector and receive a fee.	GCFPA applied for and has received approval to implement a large land-owner incentive programme for the Department of Environmental Affairs.
Commission	FPAs can negotiate bulk discounts with private sector providers – insurance, equipment providers – and charge an administration commission.	LRFPA has an agreement with an equipment provider that allows members a 25% discount on fire equipment. Of this, 5% is retained by the FPA to cover administration and management.
Donor funding	Various FPAs have applied to donors and the private sector for donations.	SCFPA receives small amounts from private sector donors and an allocation from the District that is paid as a service payment.
Working on Fire	Working on Fire receives funding from the Department of Environmental Affairs for IFM. In terms of the agreement with DEA, FPAs can access a small portion of this funding.	Several FPAs around the country receive funding for an FPA manager from Working on Fire pursuant to its mandate to provide support to FPAs and assist with their development. In addition, some FPAs receive funding for hosting a Working on Fire team in terms of operational requirements of the parties.

7.4.1 Funding by local authorities

To date FPAs have received funding from municipal government in two forms.

1. Service provider

The first form of securing funding from local authorities is as a service provider who is paid to deliver a service. This is arranged as a service provider agreement in which the District contracts with the FPA to deliver fire management services to the municipality and its citizens.

2. Grant-in-Aid

A second method of paying FPAs is for the Municipality to provide a  *grant-in-aid*. This means the allocation/contribution of municipal funds to an organisation or body outside any sphere of government, which does not constitute a commercial or business transaction. Normally, in this context “organisation” means an organisation as contemplated in Section 67 of the Municipal Finance Management Act, which is either registered in terms of Section 13 of the Non Profit Organisations Act, 1997 or a company incorporated as a non-profit company in terms of the Companies Act, 2008, or an organ of state or properly constituted community, welfare, or voluntary organisation.

 (Tool 11) *A motivation for financial assistance to the municipality* is attached by way of example.

CASE STUDY

SERVICE PROVIDER FUNDING MODEL

Eden District Municipality pays SCFPA for services annually.

This is arranged as a sole service provider agreement in which the District contracts with the SCFPA – as the only organisation, or sole provider, capable of delivering the fire management services required by the district municipality.

GRANT-IN-AID FUNDING MODEL

Lions River FPA receives money using this mechanism.

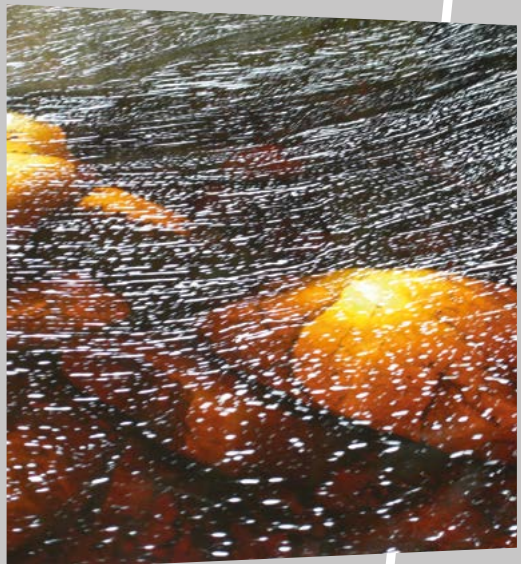
In the case of the Lions River FPA, the uMngeni Municipality provides a grant to the FPA to provide a service to its citizens on a not-for-profit basis.

In both instances, the transfer of funds is a win-win situation as the FPA is able to stretch this funding a lot further than a Municipality could through actions such as buying second-hand equipment where appropriate, cost-sharing, and negotiating for better prices outside of the confines of the state procurement system.

In both instances, and in order to secure a sustained funding flow from the local authority to the FPA, it is desirable that Integrated Fire Management forms an integral part of the Integrated Development Plan of the relevant local authority, that there is a budget line provision for it, and that the principle of securing the service through the FPA is recognised.

CHAPTER EIGHT

FPA MEDIA PROFILE





8 FPA MEDIA PROFILE

Veldfires are becoming more frequent. Increased annual temperatures have impacted on the occurrence and spread of veldfires. At the same time, we have seen a growth of urban populations within areas prone to veldfires.

8.1 Fire Awareness

An educated and informed public is a safe public. Managers need to budget and prepare for fire awareness projects in their areas of concern. The focus should be on areas of high risk, for example, school children playing with fire during the school holidays. In this case, schools would need to be included in a programme launched and run before the start of the fire season.

Remember that the community residing in each Wildland-Urban Interface will vary and any awareness campaign needs to be tailored specifically for that community. There is no “one size fits all” for awareness campaigns. Awareness campaigns need to be community specific in terms of material, should have clear objectives, opportunities for feedback, and importantly, need to be part of a greater and integrated management plan.



Newspaper articles



Twitter

8.2 Media

The most efficient way to get information to the public, the constituents served by the FPA, is through the local media. The media can, and should, be used to disseminate information about the operations, goals, mission, and services of the FPA.

Twitter and Facebook have enabled the public to spread news more rapidly, and printed media have become more efficient at publishing veldfire stories that tend to make headlines more often.

Social media can be a powerful tool if managed properly. Some of the benefits include:

- saving lives through rapid communication;



Website

- communicating (more) effectively and directly with constituents;
- reaching a larger group of constituents;
- building situational awareness;
- responding to new, incorrect, or conflicting information;
- building community resilience through prevention, mitigation, and preparedness efforts by the promotion of participation and building mutual trust in the community; and
- fostering transparency and accountability.

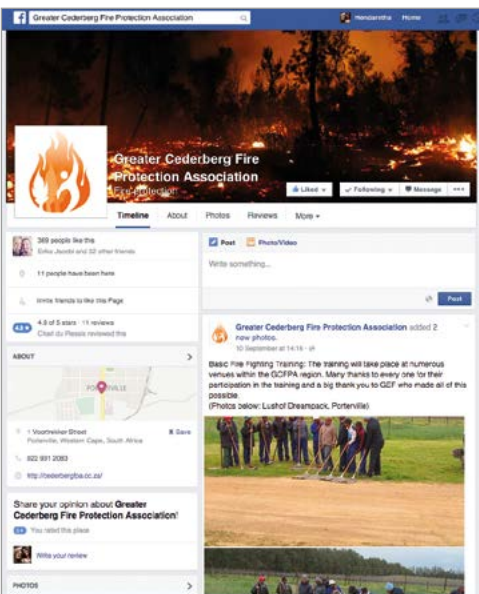
8.3 Emergency alerts and warnings

One role of the FPA may be to compile and disseminate emergency alerts, warnings, and evacuation procedures to the public during a severe fire. Emergency alerts and warnings are intended to achieve two outcomes:

- inform the community of an impending or current threat; and
- promote appropriate responsive actions.

There are a number of specific pieces of information that should be included in an emergency warning.

- 1) the name/title of warning;
- 2) who is issuing the warning;
- 3) the type of threat (and preferably a description);
- 4) how likely it is to happen;
- 5) how bad it is expected to be;
- 6) where the threat applies and who is affected;
- 7) when it is expected to happen;
- 8) what to do;
- 9) a point of contact for more information or to report events.

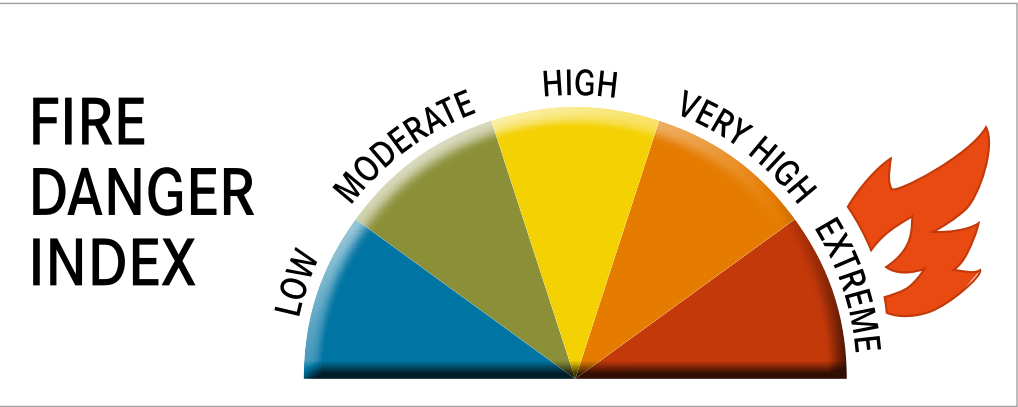


Facebook

Section 4 of NVFFA – UFPAs

(9) Nothing in this Act prevents the formation of an umbrella association for a number of fire protection associations, but a reference in this Act to a fire protection association is not a reference to such an umbrella association.

(10) An umbrella association may exercise powers under this Act or perform duties in terms of this Act on behalf of a fire protection association if the Minister agrees.



CHAPTER NINE

UMBRELLA FPAs





9 UMBRELLA FPAs

9.1 Definition

Umbrella Fire Protection Associations are umbrella structures providing overarching coordination and support to FPAs at a provincial or regional level. The NVFFA provides for the establishment of such structures but does not assign any specific mandates to them. Instead the Act provides for the realignment of mandates by the Minister.

9.2 Role and functions of the UFPA

Experience with FPAs suggests there is a need and role for an Umbrella FPA structure. This is borne out by individual FPA's willingness to pay membership fees to the Umbrella FPAs. To date, the primary role of the UFPAs has been a coordinating one, with some working partnerships occurring in some regions. With the new Working on Fire contract with a private service provider and the expanded recognition of the role of FPAs in Integrated Fire Management, the coordination and oversight role of UFPAs is being strengthened. In the contract the implementing agent, working by implication with UFPAs, is tasked with:

- provincial level strategic policy and planning in respect of prescribed burning, common standards, common rules and regulations, common methodology in respect of membership fees, joint fire-preparedness and response-planning, and protection of common assets;
- providing input with regard to the infrastructure for the deployment and co-ordination of fire fighting resources, inclusive of ground and aerial fire-fighting operations;
- assisting and facilitating the necessary resource into techniques for preventing wildfires and streamlining existing procedures nationally;
- facilitating increased awareness and coordinating training to strengthen IFM;
- liaising and coordinating with the provincial disaster management centre;
- liaising with relevant provincial agencies – conservation – and other parastatals; and
- mobilising private sector funding to reduce the financial burden on the state of FPA support.

Based on the recognition of these multiple roles, three core functions for the UFPA have been identified, namely:

- a. coordination and oversight;
- b. partnership brokering and management; and
- c. knowledge management.

9.3 Coordination and oversight

Within coordination and oversight, the following role for the UFPA is envisaged:

- coordination between FPAs in the region to ensure a provincial/region-wide strategy, common standards, and common rules and regulations;
- standardisation of systems used by FPAs in the region to enable more effective fire-preparedness, response-planning, and protection of common assets;
- coordination of a common methodology for levying membership fees;
- rationalisation of common services to increase efficiencies and reduce costs e.g. GIS mapping;
- coordination of inputs with regard to the infrastructure for the deployment and co-ordination of fire fighting resources, inclusive of ground and aerial fire fighting operations;
- facilitate increased awareness and coordinate training to strengthen IFM in the region and the application of common standards and methods;

- liaison and coordination with the provincial disaster management centre to maximise efficiencies and the impact of efforts;
- liaison with relevant provincial agencies – conservation – and other parastatals to secure their active participation and mobilisation of resources for IFM; and
- monitoring and evaluation including development and execution of FPA audits, peer reviews of FPA management team functioning, and similar efforts to achieve improved practices and common standards.

Funding for this will come from membership fees and in addition Working on Fire will allocate funds to some FPAs in the short term. Additional income streams to support this work would include administration fees for the execution of provincial disaster management functions, a share of large provincial and national landowner membership fees, and a cut of any corporate income raised.

9.4 Partnership management

The second area of UFPA work is centred on brokering, coordination, and management of partnerships in respect of IFM, Disaster Management, and National Resource management. In order to avoid overlapping roles with FPAs, the UFPA work should be focused on:

- coordination of international partnerships around common areas of interest and with regions with similar biomes;
- province-wide industry partnerships such as with the insurance industry; and
- development of new institutional partnerships within Natural Resource Management such as around carbon taxes.

Funding for this work would be sourced from any international partnership agreements, the insurance industry, and any provincial-wide programmes developed, such as around carbon taxes. The last page of this chapter lists possible donor programmes of relevance as an example of what it possible.

9.5 Knowledge management

The third pillar of work is around the collation and sharing of knowledge. The UFPA sits on knowledge that would be of value to researchers, industry partners (such as the insurance industry), and academics, both locally and internationally. Linked to knowledge collation, analysis, and sharing is a training role that is already being performed in a limited way. It is therefore proposed that the UFPA be responsible for:

- collation of provincial-wide data analysing trends in Integrated Fire Management;
- participation in IFM and NRM research initiatives; and
- compilation of information on new approaches and lessons in IFM practice.

Harnessing the knowledge could provide an income stream for the UFPA and could enable a UFPA manager to self-fund. A good parallel is the work of various agricultural economists who provide industry-aggregated information to individual farmers, government, and industry bodies. Possible income sources include the sale of knowledge products outside of the public sector and FPA community, research income, training income, and participation in conferences.



9.6 Structure of the UFPA

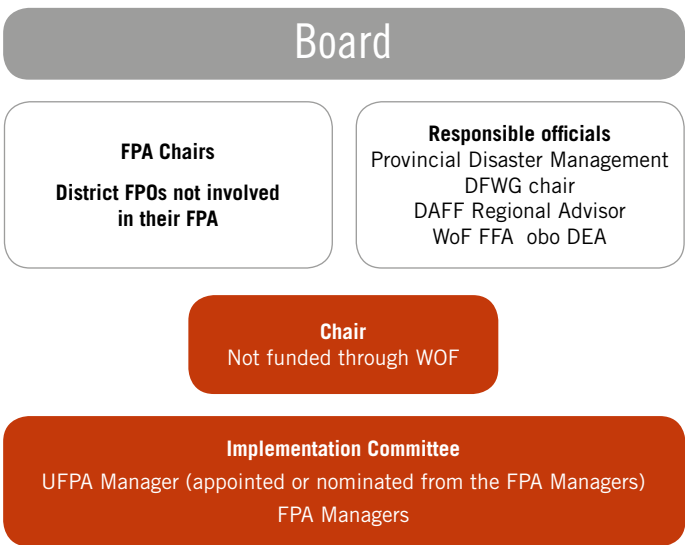
As with an FPA, it is necessary to distinguish between the governance and executive requirements of the UFPA. In order to achieve effective oversight, it is recommended UFPAs have independent Governing Bodies comprising the following structures.

- The chairpersons of the FPAs (and if an FPA is in the process of being established the representative will be the chairperson of the working committee);
- Government officials with regulatory powers including:
 - provincial disaster management;
 - DAFF regional manager; and
 - DEA or its implementing agent.

For the FPA initiative to mobilise private landowners it is recommended that the chairperson of the UFPA Governing Body be drawn from the FPA representatives. Alternatively, it should be the Provincial Disaster Management representative as the lead agent.

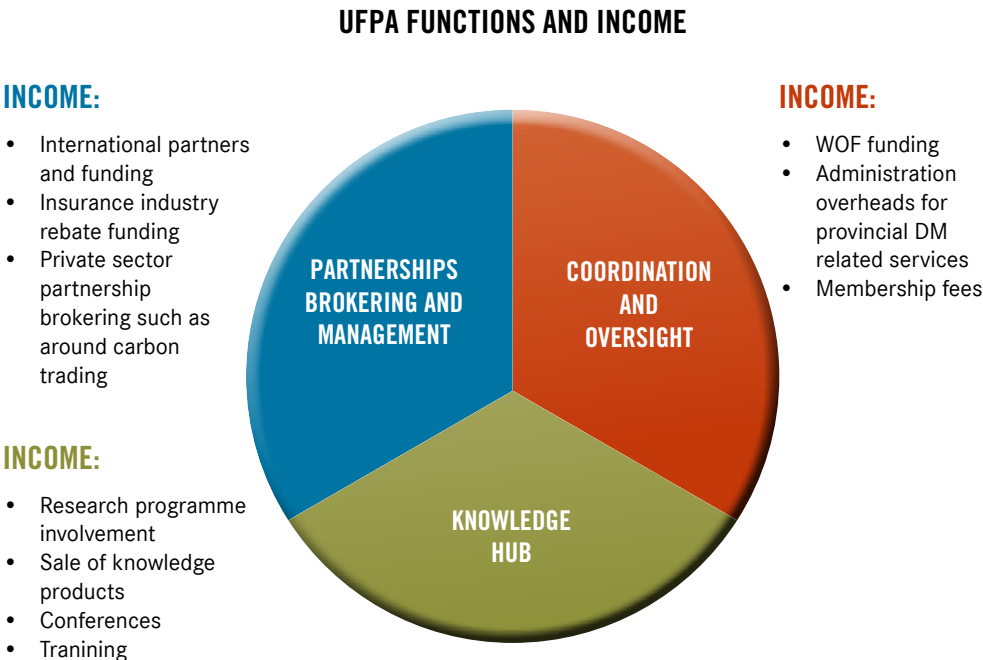
The UFPA will exercise a measure of oversight over the functioning of the WoF programme in the province, therefore none of the FPA representatives on the Governing Body should be funded directly or indirectly by WoF.

The implementation within the province will be driven through the FPAs. It is therefore recommended that an implementing committee be convened, made up of the FPA managers and any management staff employed directly by the UFPA.



9.7 Funding the UFPA

The diagram below provides a summary of the various income sources by function.



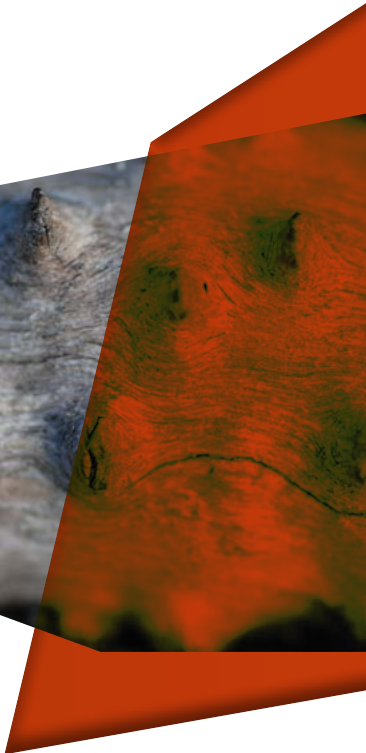
To provide a platform for Umbrella FPA discussion and participation in Integrated Fire Management issues:

- Actively participate in issues related to Integrated Fire Managementt, aerial and ground resources, within South Africa, networking closely with DAFF, all FPAs and other relevant institutions.
- Evaluate and monitor impacts of fire on land use, and facilitate the development of appropriate resources to reduce such impacts within each Umbrella FPA area of operation.
- Assist in the compilation of national documents in respect of Integrated Fire Management – providing proposal and plans that may improve aerial and ground operations
- Facilitate and coordinate fire related training for the benefit of the Umbrella FPAs and their respective members.
- Evaluate and guide the implementation of National and Provincial fire related equipment and resources (ground and aerial) for the benefit of the Umbrella FPAs and their respective members.
- Evaluate and guide the implementation of integrated communication, information, management systems and standard operating procedures.
- Facilitate the provision of information, statistics and feedback in relation to Integrated Fire Management issues to Umbrella FPAs, their members and relevant stakeholders.
- To facilitate the overall strategic direction and planning, in terms of the obligations in respect of Umbrella FPAs, as contained within the National Veld & Forest Fire Act 101,1998.

CHAPTER TEN

PRACTICING INTEGRATED FIRE MANAGEMENT





10 PRACTISING INTEGRATED FIRE MANAGEMENT

10.1 The continual process of IFM

Effective fire management is a continual process that involves a number of steps.



This continual process occurs both at a property scale and at a larger public scale. Both scales are important to secure fire safety across the rural landscape.

At a public scale, government authorities should undertake fire management planning as part of their responsibility for public safety and to support communities and industries. This includes developing and implementing plans and documents such as municipal and district fire prevention plans and ensuring that Integrated Fire Management forms part of the Integrated Development Programme.

At a property level, fire management may range from developing and undertaking simple unwritten plans to more complex documented plans. Wherever possible, landowners are encouraged to have a written plan so that it is easier for them to consider fire risk issues on their property and to communicate these issues to others. As part of this process stakeholders need to:

- identify key assets and key fire safety risks, including those from adjacent properties and features;
- consider other risks such as economic, environmental, and legal risks;
- assess whether the risks identified are relevant and/or significant to the property, by considering the likelihood and consequences of these risks happening;
- selected interventions that minimise the identified risks; and
- consult and work with adjacent public and private landowners, managers, and land users to achieve fire safety benefits for all involved.

10.2 Integrated Fire Management Plan

FPA's are required to prepare Integrated Fire Management plans in terms of the NVFFA (Section 5(1)a). An IFM plan contains strategic and operational information to support informed decision-making and to assist management and should include concise information on the fire risk and resources in an area.

The level of detail and quality of IFM plans vary across the FPA's and agencies. In reviewing the different IFM plans it became clear that as a FPA consolidates, matures, and expands its membership footprint, so it is able to provide more detail and depth to its IFM plan. In this Handbook, we recommend different levels of detail for different levels of organisational maturity.



Contents	Newly established	Consolidating	Established
Glossary: Definition of any specific terminology used.		Yes	Yes
Introduction: This should introduce the reader to the area covered by the plan, the various Fire Management Units, jurisdictional boundaries, and similar issues. It should also provide some background to the plan and the document outline.	Yes	Yes	Yes
Policy context: The intention of this chapter is to establish the linkage between the legislation, policies, the plan, and actions proposed.	Yes	Yes	Yes
Stakeholder mapping: Mapping of all IFM stakeholders and their interests as well as IFM platforms for collaboration, cross-boundary fire agreements, cooperative and mutual aid fire agreements, and any other relevant partnerships.	Yes	Yes	Yes
Fire Management Units: This section provides details of the various FMUs under the FPA and maps of the area including any specific characteristics or operational issues in the FMUs.	Yes	Yes	Yes
Fire history: Overview of vegetation typology, wildfire seasons, fire history and trends. Detailed mapping of fire history including ignitions, Fire Danger Index readings, burnability, fuel pathways, and fire ecology over the last 10 years. Environmental, financial, economic and social impacts of fires.	Yes No No	Yes Yes Partial	Yes Yes Yes
Fire mapping and risk assessment: Initial mapping fire risk using GIS identifying veld types and fuel-load, veld age, hot spots, and ecologically-sensitive areas across the region (1:50 000). Detailed mapping identifying veld types and fuel-load, veld age, predicted fire hazards, hot spots, and ecologically sensitive areas at FMU level (1:10 000). This should include hazard and burnability maps. Detailed mapping at farm level identifying veld types and fuel-load, veld age, predicted fire hazards, hot spots, social, environmental, and economic risks, and ecologically sensitive areas. This should include burnability maps, vegetation age maps, fuel hazard maps, and risk maps.	Yes	Yes	Yes
Fire prevention and mitigation: Fuel load management plan to mitigate risks and prevent fires including firebreak plan, controlled burn plans, and fuel load reduction plan at: Regional scale – high level; Detailed farm level.	Yes	Yes	Yes Yes

Contents	Newly established	Consolidating	Established
Capacity assessment: Evaluation of current capacity for fire management, detection and suppression, and legal compliance at partnership level and FMU level. At membership level. At farm level.	Yes	Yes	Yes
Action plan: Incident Command System for fire detection and reporting, fire suppression, communication of fire related matters.	Yes	Yes	Yes
Communication: Education and awareness plan. Plan to keep members informed. Any media plans and protocols.	Yes	Yes	Yes
On-going M&E and communications: Reporting requirements. Process to determine whether the IFM plan is being implemented. On-going data-gathering indicators and system.	Yes	Yes	Yes

The plan should be updated annually and revised every three years to ensure it is relevant and takes into account changes in land use and risk.

The different components of Integrated Fire Management, as set out in the table above, are interwoven and are relevant throughout the year. However, the level of attention to each may vary according to the seasons. See section 14.7 for more details.



GIS mapping of the Southern Cape FPA boundaries

FREQUENTLY ASKED QUESTIONS ABOUT IFM PLANS



What is an IFM Plan?

The IFM Plan is the equivalent of the FPA business plan. It sets out what needs to be done to achieve IFM and the challenges and issues.



Why do FPAs prepare an IFM Plan?

To register under the NVFFA an FPA is required to submit a business plan that is the same as an IFM plan and Section 5 requires them to submit an IFM plan annually.



Who needs to be involved in drafting an IFM Plan?

There is no prescription of who needs to be involved in the drafting of an IFM plan in the NVFFA. Some FPAs contract the task out to a consultant and others engage members and draft the plan collaboratively. Ideally some level of involvement from partners and members is useful as this facilitates the plan becoming a live document that is guiding activities on the ground rather than just a compliance exercise.

10.3 Integrated Fire Management business unit plan

The IFM business unit plan provides a detailed plan for each management unit within the FPA.

This plan includes:

- a background and description of the unit and maps of the area;
- list of the available resources – equipment, trained personnel, fire services;
- logistical arrangements in the event of firefighters being deployed to fight a fire in the area including:
 - clothing;
 - equipment;
 - transport;
 - first aid;
 - food; and
 - related resources (needed and available);
- localised fire readiness preparations including:
 - fire awareness education;
 - proof of annual fire readiness audits by landowners;
 - fire readiness information and exercises; and
 - dissemination of information on fire danger ratings;
- action plan on orange and red days including implications for:
 - members;
 - burn permits; and
 - volunteer and employed firefighters;
- policies and procedures for reporting fires;
- policies and procedures for controlled burns;
- protocols for handling of emergency situations and uncontrolled burns including:
 - incident command system;
 - fire reporting; and
 - handling of the media in the event of a fire outbreak;
- procedures for fire post-mortem and statistics reporting; and
- administration, including information on any forms and systems to be complied with.



For more information on Fire Management Unit planning see the *Fire Management Unit Planning Template*.



Above: Wildfire plans provide authorities with an overview of fire management measures that are in place



Left: A wildfire plan is a convenient tool to assist in fire fighting operations

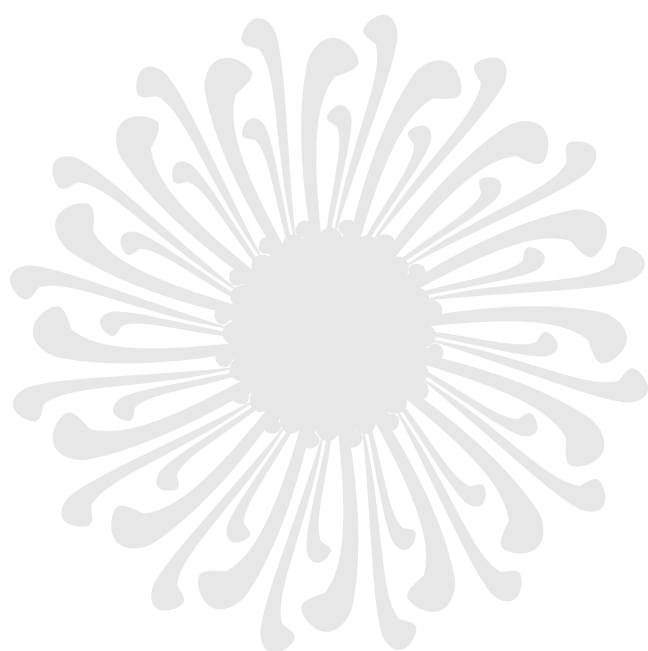
10.4 Provincial wildfire plans

Following on from the obligations created in terms of the National Disaster Management Act, some provinces have embarked on a process of developing wildfire plans.

The plans should do the following:

- provide the various responsible fire authorities and agencies within the province with an overview of the current arrangements that are in place for the management of veld and forest fires in the province;
- provide fire and rescue services, fire prevention associations, volunteer organisations, and landowners with a convenient reference to the key structures and systems available and required to undertake effective and safe fire fighting operations at wildfires in the province;
- contain an overview of wildfire preparedness, prevention, and response arrangements; and
- reflect an integrated approach and shared responsibility for wildfire management between government, agencies, communities, and individuals.

The wildfire plan developed for the Western Cape can be viewed at https://www.westerncape.gov.za/assets/departments/local-government/Fire_Brigade_Services/For_the_fire_service/western_cape_provincial_government_veld_fire_plan_2014_2015.pdf



CHAPTER ELEVEN

STAKEHOLDER MOBILISATION





11 STAKEHOLDER MOBILISATION

The interaction between people and fire cannot be avoided. Fire is an integral part of human life – be it in the use of fire for cooking, warmth, or veld-management. In the context of rapid urbanisation, the rampant and haphazard growth of structures, and the increased propensity for fires as a result of climate change, the relationship between humans and fires has become more complicated.

Humans are responsible for starting the majority of wildfires and the only solution to effective fire management is to engage people and move the public from being part of the problem to being an active part of the solution. Fire awareness activities must involve the community and other groups in Integrated Fire Management. A well-informed public is less likely to use fire irresponsibly and is also more likely to be a fire detection resource. FPAs, government, and conservation agencies all have a responsibility to raise awareness.



Education provides people with an understanding of the risks of wildfires, and the measures the community can take to minimize these risks. Different types of programmes are needed for different audiences.

11.1 Integrated Fire Management awareness

IFM awareness takes many forms.

- information in the public media (digital and paper) about IFM, which works well for the general public;
- information in social media and other digital forms, which works well for targeted interest groups and young people;
- direct communication works well for landowners;
- structured talks and lessons work well for schools and NGOs;
- radio and television campaigns and information in local newspapers work well for communities;
- conferences work well for scientists and academics;
- public notices in fire prone areas alerting people to the dangers work well for walkers, cyclists, and tourists.

Campaigns need to provide advice on issues such as open fire management and safety, campfire safety, conducting controlled burns, burning of rubbish outdoors, proper disposal of cigarette butts, fuel load reduction, the law, and landscaping as a tool to reduce fire risks.



Educational material that is circulated to promote fire awareness

11.2 How to mobilise stakeholders

There are three principle ways of mobilising stakeholder around IFM.

- a) Convince landowners and interested parties of the value in working together and sharing resources and skills to reduce risks.
- b) Inform them of their obligations and responsibilities in terms of the law.
- c) Galvanise action after a fire, when people are alerted to the risks and issues.

CASE STUDY

Case study of Cape Peninsula Fire Prevention Association (CPFPA)

The CPFPA was established in 2000 when landowners identified the need to act proactively to reduce risks after that year's damaging fires. Over the past 15 years, the FPA has provided members with services but has struggled to expand its base.

However, after the fires of 2015, over R3-million was raised towards volunteer fire fighting. It also provided a platform to educate the public about wildfires and wildfire prevention, saw landowners taking action against non-compliant landowners with high fuel loads on their properties, and resulted in communities working together across traditional divides.

11.3 Sustaining stakeholder engagement

Much of the stakeholder mobilisation requires collaborative leadership skills where the FPA management and executive work to mobilise diverse and, at times, conflicting interests towards a common interest - namely reducing fire risks and increasing fire preparedness. This requires the FPA management team to do the following:

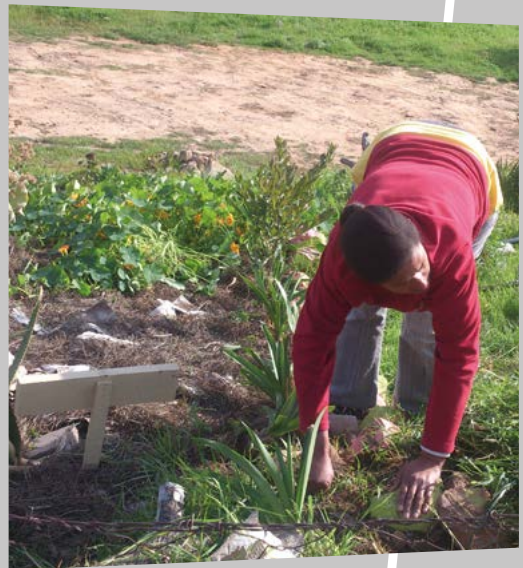
- spend time listening to stakeholders' interests;
- engage stakeholders in collective problem-solving and action;
- manage conflicts constructively;
- navigate the fine line between persuasion and enforcement; and,
- most importantly, build confidence and trust through action and success.

In the words of an FMU executive member, "Landowners will only be galvanised to add real value if they feel the benefits. Until then it is just a compliance exercise for them."



CHAPTER TWELVE

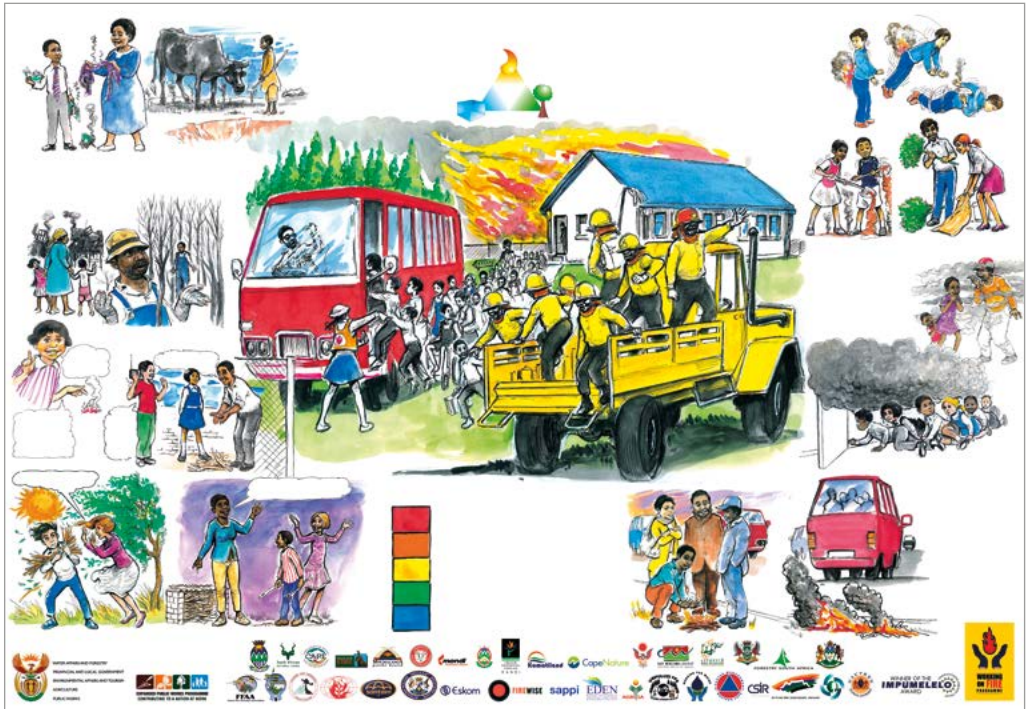
THE FIREWISE COMMUNITIES PROGRAMME





12 THE FIREWISE COMMUNITIES PROGRAMME

Fire is necessary for an ecosystem to function, and because ecosystems are fire-adapted, fire is inevitable in many parts of the country. Thus, wherever possible, fires need to take place in a managed and controlled way so as to reduce the risk to lives and property. Over time, because of the exclusion of fire, there has been a build-up of fire fuels. This is detrimental to ecosystem health, can affect the productive capacity of agricultural lands, and can promote circumstances that lead to uncontrollable conflagrations.



The FireWise Communities Programme interacts directly with communities at risk from wildfires

The risk of damaging wildfires is made worse by the increase in lands infested by invasive alien plants. The Wildland-Urban Interface – areas where human habitation borders and mixes with open veld – is increasing. Many of these areas are remote and cannot depend upon authorities to protect or respond during a fire. Increasing the coping skills and resilience of such communities is desirable. This is in line with international disaster management practice and South Africa's Disaster Management Act of 2002.

The FireWise Communities Programme was initiated in 2005 as a multi-stakeholder advocacy and awareness platform, able to interact directly with communities at risk from wildfires, aiming to change public and community behaviour, and reduce unwanted ignitions to limit the frequency of damaging wildfires. FireWise concepts are fully integrated with the aim of promoting Integrated Fire Management, the internationally accepted principles of Community-Based Fire Management and the broader environmental duty-of-care goal.

The overall objective of the FireWise Communities Programme is to empower interested communities to take responsibility for reducing the risk of uncontrolled fires in their areas. This is achieved by using the collaborative FireWise planning process to transfer knowledge and skills on wildfire prevention, protection and response. Effective partnerships can resolve community challenges in hazardous Wildland-Urban Interface areas. The benefits of partnerships include the sharing of ideas, expertise, and knowledge, as well as the sharing of fire protection responsibilities.

12.1 Identifying the need for a FireWise Community

Veldfires are a natural feature of the African landscape. Communities exposed to veldfires may range from poor rural communities to wealthy developers. Many rural communities have a history of living with fire and may even use fire for grazing, hunting, or clearing land. The lack of basic resources, however, has placed many of these communities at risk during the annual fire season. Very often communities rely on fire brigades to protect their properties, either because this is common belief, or, because as a ratepayer, it is an expected service. We need to recognise communities are vulnerable to uncontrolled veldfire hazards.



Fire awareness billboards for high fire danger areas

It should be born in mind that communities do not function in isolation. They border on, and simultaneously impact on, neighbouring communities with a variety of different activities (such as forestry and agriculture). Very often they border on formally structured communities, who already practice active veld-fire management. Alliances can be formed with these neighbours and this can lead to the establishment of effective sustainable FireWise Communities. In ideal circumstances, communities in more developed areas will include everyone ranging from homeowners, landowners, farmers, and foresters to community workers, elected officials, and local authorities.

12.2 Community involvement

Traditional and historical roles, sometimes reinforced by the media, label firefighters as “protectors” and “heroes”, while the homeowner is the “helpless victim”. In FireWise Communities, however, protection and prevention belongs to **everyone** in the community. A key objective of FireWise planning is to define all the responsibilities and to encourage appropriate action by various groups and individuals. When responsibilities are clearly defined and direction is provided, the mind-set of “protector” and “victim” can be redefined. Firefighters and homeowners can become partners.



Community involvement

Other contributions by other organisations include:

- education curricula at schools designed to offer fire safety education in selected grades;
- police and law enforcement agencies who usually offer emergency response in the event of evacuation; and
- the Water Department whose responsibility it is to plan, design, operate, and maintain water distribution systems to ensure water availability during fire suppression activities.



12.3 The aims of a FireWise Community

The primary focus of FireWise is to create awareness of the dangers of uncontrolled fires by equipping homeowners, community leaders, planners, and developers with the knowledge about risk reduction so that they can find local solutions to veldfire safety. The protection of families, property, and the environment before a fire starts is a priority, as is the provision of an action plan for an emergency.

The FireWise Community aims to:

- improve safety in the Wildland-Urban Interface by learning to share responsibility;
- create and nurture local partnerships for improved decision making in communities; and
- encourage the integration of FireWise concepts into community and disaster alleviation planning.

There is something in it for everyone, whether it's preserving lifestyle, avoiding skyrocketing public costs, increasing corporate visibility, or improving image, building customer base, or just having the confidence to know that residents are more secure.

12.4 Stakeholder communication

Communicate! Communicate! Communicate!

Once landowners and the public have been engaged and mobilised the challenge for FPAs is sustaining this involvement. Communication needs to be regularly provided as part of building the community and FPA institutional base and can cover such matters as fire lessons, fire dangers, and new management tools. Here is an example of an FPA newsletter sent out monthly to members.

Dear Member,

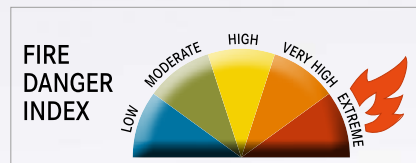
What a great week with no fire incidents!

Last night saw some storm activity moving down from Botswana and over central South Africa, the tail ends crossing over us early last night. With the storm came some moisture (which had been predicted as of last week), but unfortunately not very widespread, and seemed to disappear as the storm moved down and over the ridge. The next few days are going to be relatively warm and with some wind around, with a very warm mid-week, no moisture is predicted for the next 10 days. No block burning will be permitted next week – still very dry.

Training

I thought it would be useful to share how the fire danger index (FDI) is calculated:

- Dry bulb temperature – low temp day will bring the FDI down and vice versa.
- Relative Humidity – low humidity level will increase the FDI and vice versa.
- Wind speed – the higher the wind speed the higher the FDI, however low temp and high humidity may keep the FDI low, but it does not mean one can burn – e.g. 12deg / 50% humidity / no rainfall / 30km wind – will give a relatively low Yellow FDI – in essence burning would be permitted, however the wind factor will not permit burning to take place.
- Rain mm – at this stage a very welcome event – the more rain the lower the FDI, however, read below.
- Days since rain – the amount of rain fallen will slowly be “burnt off” as a result of temperature and wind – hence the higher the temp and the stronger the wind, the quicker the rainfall factor is eliminated from the FDI calculation.



What is happening around the world?

Canada: Worst wildfire season in decades in Canada's Northwest Territories

The wildfire season continues to get worse in Canada's Northwest Territories. Already listed as the worst season for fires in memory, it's now estimated to be costing the territorial government Canadian \$1 million (U.S. \$931,000) a day to fight the fires. "What we are seeing in the Northwest Territories this year is an indicator of what to expect with climate change," says Mike Flannigan, a professor of Wildland Fire in the University of Alberta's renewable resources department. "Expect more fires, larger fires, more intense fires". Wildfire extent is double that of the 1970s.

According to the Canadian Interagency Forest Fire Centre, there have been 31 new fires in the past 24 hours across Canada, over 2,500 so far this year and well over 2.47 million acres burned to date, early in the season. According to Flannigan, in recent years, about 8,000 fires burn about 4.9 million acres of land each year in Canada. That's about double the annual average of just 40 years ago, he says.

Canada's senior climatologist, Dave Phillips, says the southern Northwest Territories are experiencing the hottest, driest summer in some 50 years. The extremely hot dry weather in the interior and north of British Columbia is now contributing to the spread of a number of fires in that west coast province. Phillips adds the kind of weather seen this year is what global warming modelling predicted for 40 years from now.

Floods in eastern Canada: Although there are major fire concerns in the west and north, the prairies, especially Saskatchewan and Manitoba are still recovering from highly unusual major summer floods. Unusually heavy rainfall has caused abnormally high levels of flooding in several areas of Canada this year. Earlier, many parts of Quebec experienced flooding when heavy rain overcame storm sewers and caused rivers to overflow their banks.

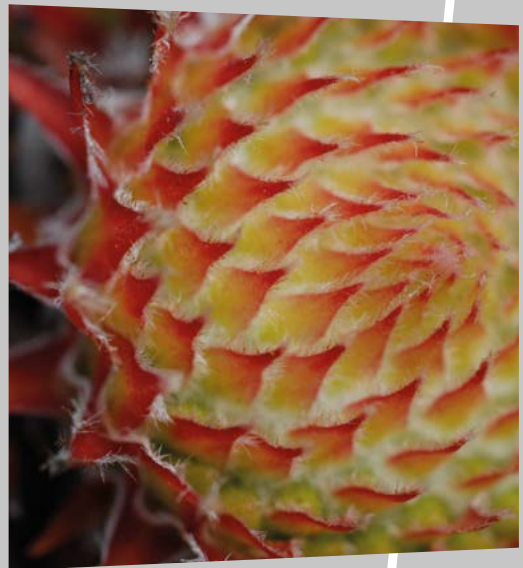
In Canada's Maritime Provinces, many are still without power a week after tropical storm Arthur swept through uprooting trees, tearing roofs, and downing power lines.

REMINDER: MEMBERS FIRE EQUIPMENT – UPDATE REQUIRED

Thank you to all members who have submitted their forms – the email had hardly been sent and we had a fantastic response. Hence a reminder to other members, please complete the attached form and scan & email (admin@lionsriverfpa.co.za) or fax (086 551 5828) back to Pat. We are busy updating the GIS database and need to understand what equipment members have on farms. Your attention is drawn to the guidelines as contained in the rules & regulations of the LRFPA, in this regard. No equipment = non-compliance. No form returned means no equipment!

CHAPTER THIRTEEN

RISK ASSESSMENT





13 RISK ASSESSMENT

The concept of risk management underpins all decisions in fire management. It involves identifying fire risks and balancing the likelihood of a wildfire against the consequences should one occur. For example, while an event like a fire may be unlikely to happen, its consequences can be major or even catastrophic. Consequently, plans are needed to minimise risk. When planning fire management, it is important to think about economic, environmental, and social risks (risks to people). The impact of both fire prevention activities and fire itself can affect safety, the environment and the long-term sustainability of the livelihoods derived from a property.



Fuel loads are a fire hazard and should be cleared off a landowner's property

A number of factors impact on an assessment of fire risks including:

- weather, climate change, and fire-related trends;
- veld type, veld age, and fuel types
- fire history and burn scars; and
- urban edge activities.

Using a combination of these factors, South Africa has developed a fire risk map. The National Veldfire Risk Assessment can be downloaded from: www.daff.gov.za following the sequence of tabs Branches > Forestry & Natural Resources Management > Forestry Regulation & Oversight, Fire Management. Navigate to **Maps** for the revised (March 2010) map of veldfire risk.

13.1 Weather, climate change, and fire trends

Climate change is an alteration of the earth's general weather conditions. The most prominent change is the rising temperature of the earth's surface. It includes changes in rainfall patterns and changes in extreme weather events that lead to natural disasters such as flooding.

The most recent assessment of climate change in South Africa revealed some interesting information.

- Rainfall varies between years and, in any one year, varies throughout the year, especially in the arid west and northwest.
- The minimum and maximum temperatures during the year are consistently warming over most of the sub-continent.
- The number of extreme hot days and nights is increasing yearly.
- The warming trends are strongest in the western interior, western and southern coastal areas (i.e. the Fynbos Biome), and weakest over the central interior.
- The number of days when the fire danger was considered high, very high, or extreme are projected to increase to more than twenty per year for most of the interior of the Fynbos Biome, and between ten and twenty days for a narrow coastal strip along the Southern Cape coast.
- While there has been an increase in surface wind speeds in South Africa's southern coastal regions, evaporation and wind speeds have both declined significantly in the Western Cape.
- There have been significant increases in daily rainfall intensity and dry spell duration over the southern African region.
- Increases in precipitation in the southwest of South Africa, and significant decreases in the northeast.

The magnitude of the projected changes in climate will depend on the future emissions of greenhouse gases. If there is little change in emissions in future, daily temperatures will increase by 3 – 4 °C along the coast and 6 – 7 °C in the interior. Rainfall is likely to decrease in the western parts of the country, particularly the western coastal region. These changes are expected to have significant impacts on natural ecosystems and on fire regimes.

FAQ: What are the trends with wildfires in the Fynbos Biome?

Below is some of the information gleaned from an analysis of the combined fire records kept by Cape Nature and SANParks for the Outeniqua-Tsitsikamma for the period between January 1978 and December 2012.

- There were 3 261 fires.
- A total of 2 885 991 ha was burnt.
- Fifty-two fires (1.6% of all fires) accounted for 33% of the area burnt and each of them was greater than 10 000 ha.
- Most fires occurred between December and March, with December having the highest incidence. One large fire was recorded in June in the southern Cape and no large fires occurred between July and September.
- There were particular years when clusters of fires occurred over a short period (days to weeks). Although not continuous and often spread across the biome, these fires collectively burnt considerable areas.
- The area burnt in each “fire year” (where a fire year begins in November and ends in October the next calendar year) varied widely with the largest area burnt being 210 000 ha in 1999 when there were large fires in both the Western and Southern Cape (Figure 1). High fire years are sometimes followed by years with a lower total burnt area, probably because large areas were too young to burn for at least three to five years.
- There is no evidence that the total area burnt per year is increasing but there is evidence that the fires are recurring more frequently in areas with more human activities.
- Lightning is an important cause of fires and a single weather system, or series of systems, can result in lightning fires spread across the biome.

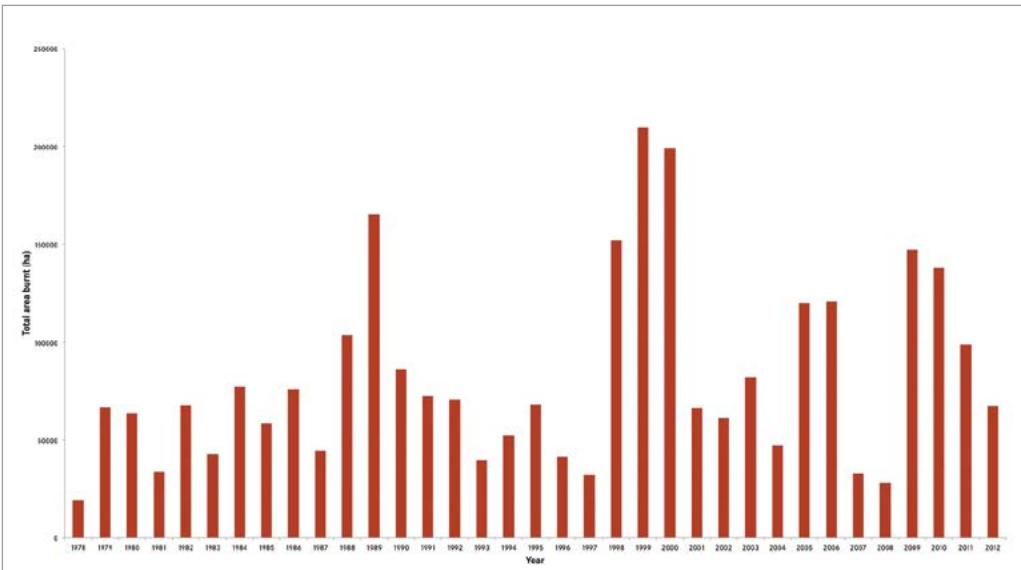


Figure 1: Areas burnt by fire year (all fires are counted as falling in the second year, thus 1978 runs from November 1977 to October 1978)

13.2 Veld types, veld age, and fuel types

Fires in fynbos differ from those in grasslands. In fynbos, it takes a few years after one fire has burnt for enough fuel to accumulate to sustain another fire under typical fire conditions. However, different kinds of fynbos accumulate fuels at different rates, with the result that some fast-growing fynbos species are able to burn again before other, slow-maturing plant species in the area have accumulated sufficient seeds for successful regeneration. It also means that, under the same conditions, some kinds of fynbos have more intense fires than others of the same age.

While some fynbos vegetation types differ in this way, there are different fynbos vegetation types that have similarities in their speed of re-growth and canopy cover. They have similar characteristics and, as a result, can be grouped together as a single “fuel type”.



Risk mapping

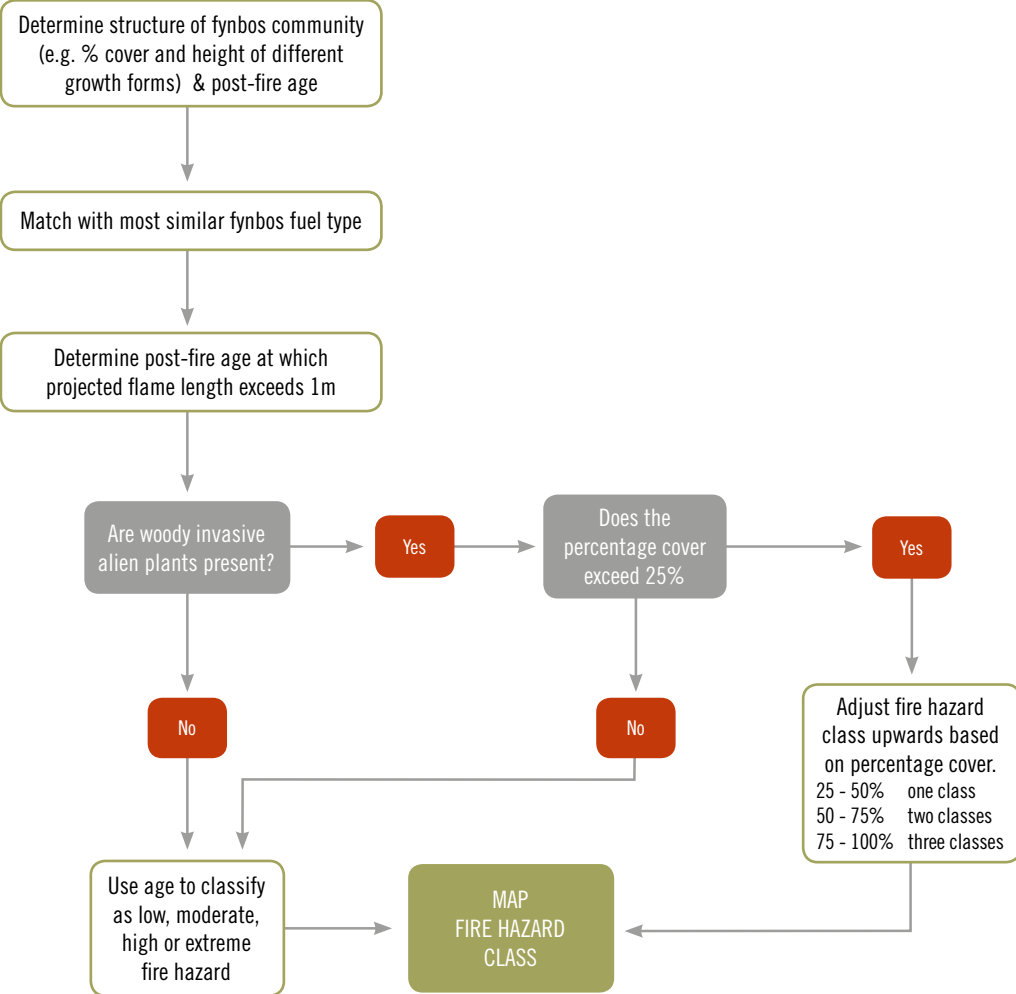
13.3 How to map fire hazards

The Behavioural Education for Human, Animal, Vegetation and Ecosystem (BEHAVE) modelling system has been used to project fire behaviour for different fuel types. It does this by using information on the amounts of fine (e.g. restios), medium (e.g. twigs) and coarse (e.g. protea stems) fuels, veld age and standard summer-fire conditions. Fire experts stated that the threshold for safe, manual fire fighting is a projected flame length of 1m (Figure 2) so the post-fire age at which the flame length will exceed 1m has been set for each fuel type. The younger the age at which the fuel-type exceeds the 1m thresholds, the greater the fire hazard it presents. Invasive alien plant species also generally increase fuel loads and fire intensities. This is in proportion to their density. Where there is less than 25% coverage, the invasive alien species have little or no impact on fire danger (Figure 2). However, it increases exponentially beyond this. This information is used to produce a map highlighting the areas with the fuel types which pass the threshold at the youngest age or are densely invaded.

This is a surrogate for a map showing fire hazard based on the known post-fire age, but is a practical alternative where the post-fire age is not known for most of the area of interest.

Where the densities and dominant alien species are known, the information can be used to increase the fire hazard rating in proportion to the density.

FIGURE 2: PROCEDURES FOR DETERMINING THE FIRE HAZARD CLASS FOR FYNBOS VEGETATION TYPES, AND ADJUSTING IT FOR THE IMPACT OF INVASIONS ON FIRE BEHAVIOUR



13.4 Fire history and burn scars



Burn scars can be observed with the eye

Data on the areas burnt between different dates can be obtained from remote sensing and is called the “burnt area” data. This information is essential for building up a sound and reliable record of fires in an area. Data on actual fires can be used to improve and provide information on causes, sizes, return intervals of fire, and other factors that can be used to guide and improve fire management. Data on the occurrence of fires and burnt areas can be obtained from remote sensing but the best data comes from accurate ground-based mapping. Remote sensing of burnt areas in fynbos is still not accurate enough for analyses of fire histories or sizes, but it can be useful where there are no other sources of data.

Basic data required to gain a sound understanding of the main elements of the fynbos fire regime and to identify management interventions or responses.	
Element of the fire regime	Data required
Frequency	Start and end dates and a unique fire identifier (code) when combined with a map of a fire, the overlaps between successive fires can be used to calculate the return intervals and whether or not this exceeds the threshold for ecological acceptability.
Season	Start and end dates can be used to determine the proportions of the fires occurring each season and whether or not this is ecologically acceptable.
Intensity	Difficult and impractical to measure in the field but can be estimated from observations and from information on fuel loads, spread rates, and weather conditions during the fire. Important for understanding the impact of the fire on soils, soil-stored seeds, their survival and germination, and plant recruitment.
Severity	Difficult and impractical to measure in the field. A measure of the intensity and the time period that the fire burned at a spot can be inferred from the state of the soils, sizes of un-burnt or partly burnt material. Same ecological value as the intensity.
Cause	Identifies the source and type of ignition. Can be used to understand the human role in fires and to identify trends, which need management interventions, and can be used to educate people about the importance of being firewise.
Size	Based on maps of the fire from ground-based mapping, aerial photographs or satellite images. Essential for determining fire recurrence intervals and improving understanding of fire behaviour and dynamics.
Point of ignition	Essential for improving mapping of fire hazard or ignition risk and for planning management interventions and taking legal action.

13.5 Urban edge activities

The Wildland-Urban Interface (WUI) is the area where people and their assets are exposed to harm from wildland fires. A sequence of steps to follow in determining the risk associated with a wildfire occurring on the WUI is shown below. The fire risk comprises two parts. The first is an assessment of the fuel loads and what kind of a fire they could sustain, and the second assesses the potential consequences of that fire in terms of possible harm to people and property exposed to such a fire.

STEPS TO FOLLOW WHEN DELINEATING THE WILDLAND-URBAN INTERFACE AND ASSESSING THE HAZARDS AND RISKS ALONG IT



People living on the WUI are exposed to damaging wildfire



Homeowners should identify and assess risks before each fire season

Determine priorities for intervention

Data and statistics from the risk assessment must be used to identify the various fire risks. These considerations can then be used to establish the priority issues to address. Priorities can be established by identifying specific issues.

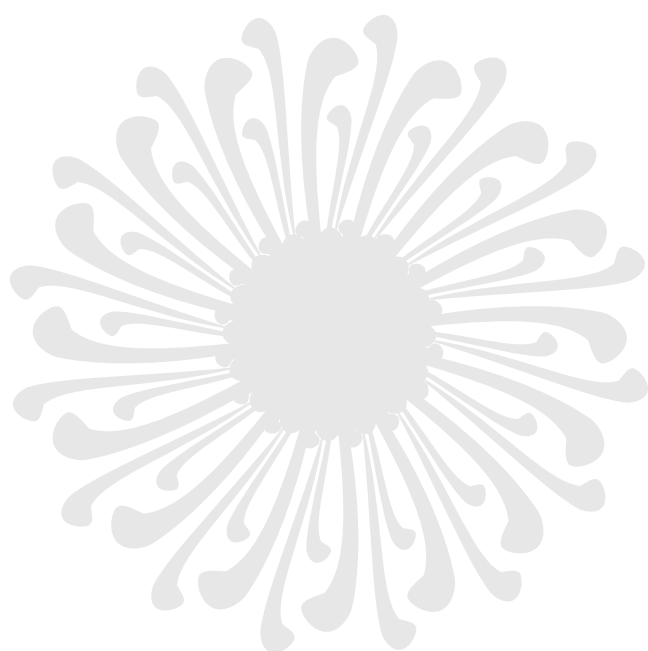
- Impact of the fire risk on the community in terms of life, injury, property damage and other economic or environmental impacts. This can be measured in terms of people injured, or the cost of fires.
- Frequency of the problem, or how often it occurs.
- Likelihood of the problem getting worse without intervention.
- Existing community programmes that successfully address the fire risks.
- The trend of the problem - is there an indication the fire risk is getting worse over time.
- The mission and the goals of the organisation. (There may be some fire problems that are clearly outside the scope of the organisation.)

The FPA manager should pose each consideration in terms of specific questions.

- What is the impact of the problem on the community?
- What is the frequency of the problem?
- Is the problem getting worse or better?
- What is the likelihood the problem will get worse without an educational programme?
- What other programmes are targeting the problem?

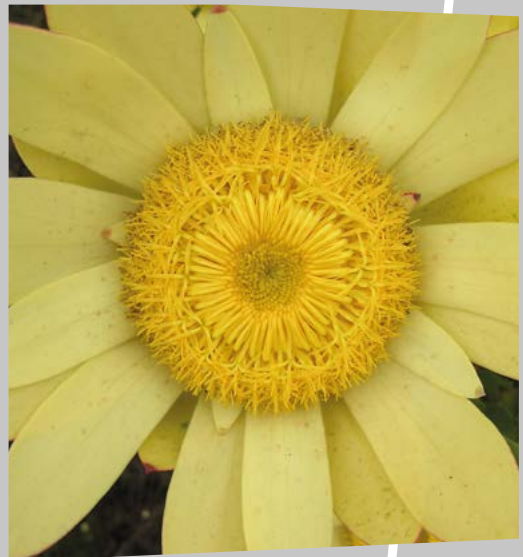
Decision makers must review the considerations and establish the priorities based upon their judgment. This, at times, is difficult.

The fire risks should be categorised as a high, moderate, or low priority. High-priority risks should be addressed immediately. Moderate-priority risks are less urgent and can be attended to next. Low-priority risks should only be addressed once high and moderate priorities have been dealt with.



CHAPTER **FOURTEEN**

PREVENTION, PROTECTION, AND PLANNING





14 PREVENTION, PROTECTION, AND PLANNING

Preventing unwanted damaging fires is always less costly than suppressing them. In addition, prevention programmes raise awareness around wildfires and help mobilise landowners to get involved in their FPAs.

14.1 Implementing Wildland Fire Awareness Programmes

In South Africa, wildland fire awareness education has progressed significantly over the past 15 years with the UKUVUKA campaign in 2000, the FireWise Communities programme in 2005, and most recently the Fire & Rescue Service’s “Fire is Everyone’s Fight” campaign initiated in 2015.

The concept of proactively educating a high-risk community on how to prevent harmful fires and how to survive them has been expanded to include an “All Hazard” approach. Fire safety engineering, enforcement, and educational interventions that reduce fire risk work very well when applied simultaneously as part of an overall IFM strategy. This “synergistic” effect enhances fire risk reduction and is an important reason why community education must be a priority within any FPA mission.

14.2 What is Community Risk Reduction?

Community education, also known as public education or fire and life safety education, is part of an overall process called Community Risk Reduction (CRR). Community Risk Reduction uses prevention processes to reduce or eliminate hazards and risks in the community, thus reducing the frequency and severity of fires, injuries, and property loss.

The first step in the CRR process is methodical planning (see diagram 1). However, the foundation for long-term success is laid long before the planning step is begun. To ensure long-term success the most appropriate individuals must be made responsible for the process. In addition to this, there must be strong personal and organisational commitment to making the programme achieve its goals and objectives. The overall organisational attitude about the community education programme is the area where the seeds of success are sown.

The organisational leadership must understand, first, that community education can effectively reduce the risk of fires when used as part of an overall prevention strategy; second, that it takes months and years for community education initiatives to be effective, thus requiring a long-term investment on the part of the organisation; and third, any community education effort must be completed in partnership with other community organisations.

COMMUNITY RISK REDUCTION - 5 STEP PLANNING PROCESS



Veldfire Risk and Hazard Assessment Form (South Africa)

(Assign a value to the appropriate element, and add all points to determine risk assessment)

Element	Points	Score
A. Means of Access		
1. Entry & exit roads: Two or more roads in/out or one road in/out	0 - 7	
2. Road width: More than 6m or more than 6m but less than 7m or less than 6m	0 - 2 - 4	
3. All-season road condition		
a. Surfaced road, camber grade less than 5% or greater than 5%	0 - 2	
b. Gravel, camber grade less than 5% or gravel, camber grade greater than 5%	2 - 5	
4. Municipal Fire Brigade Service Access		
a. More than 9m with turnaround or less than 9m with turnaround	0 - 2	
b. More than 9m with no turnaround or less than or equal to 9m with no turnaround	4 - 5	
5. Road Signs: Present and reflective or present but not reflective or not present	0 - 3 - 5	
B. Vegetation (Fuel Models)		
1. Characteristics of dominant vegetation within adjacent to and on property.		
a. Light (Alpine grasses, coastal fynbos)	5	
b. Medium (short shrub and fynbos, moist savanna, gum, pine and wattle plantation)	10	
c. Heavy (tall grass, mature mountain fynbos, dense woody alien plant invaders)	20	
2. Defensible space: More than 30m of adapted vegetation from the property - 22m to 30m - 9m to 21m	1 - 3 - 10 - 25	
C. Dominant Topography within 90 m of structure/s		
1. Slope less than 10° or 10° to 20° or 21° to 30° or 31° to 40° or greater than 40°	1 - 4 - 7 - 10	
D. Additional Rating Factors (rate all that apply)		
1. Topographical features that negatively affect veldfire behaviour i.e. hot and dry northern slope aspects, gullies, kloofs	0 - 5	
2. Sources of possible ignition that occur within the area assessed. Rate severity on a scale of 1 to 5: frequent lightning - railways - mountain passes - power lines - picnic and camping sites	0 - 5	
3. Areas that are periodically exposed to unusually severe fire weather and strong dry winds	0 - 5	
4. Neighbour boundary density factor, or potential sources of accidental ignition (add number of properties or neighbours per km). Less than 1 per km or 2 - 4 per km; 5 - 7 per km; 7 - 10 per km or More than 10 per km.	0 - 5	

Element	Points	Score
E. Dominant Roofing Type		
1. Tin roof or slate or tile roof or asbestos roof or thatch	0 - 3 - 15 - 25	
F. Dominant Building Construction Type		
1. Materials (dominant): Non-combustible/fire resistive walls, eaves & deck (stoep) - non-combustible/fire resistive wall, combustible deck (stoep) - combustible wall and deck (stoep)	0 - 5 - 10	
2. Building distance from the nearest slopes of 30% or more: More than 9.1m to slope - less than 9.1m to slope	1 - 5	
G. Available Fire Protection		
1. Water source availability: Pressurized water source availability - stand alone pump non-pressurized water source - no water	0 - 1 - 2 - 3 - 5 - 10	
2. Organised response resources: Station is less than 8 km from structure or station is more than 8 km from structure	1 - 3	
3. Fire Detection Facility Camera monitored 24 hour or manned lookout or alternative plan or satellite or none	1 - 2 - 4 - 6 - 10	
H. Membership of Fire Protection Association/ Firewise community		
Yes (0) or No (20)	0/20	
I. Safety Zone		
Does the community have a safety zone?	0	
Total		
HAZARD ASSESSMENT Total Points: LESS THAN 40 > LOW HAZARD BETWEEN 40 AND 64 > MODERATE HAZARD BETWEEN 65 AND 109 > HIGH HAZARD GREATER THAN 109 > EXTREME HAZARD		

14.3 The focus on prevention

The best way to manage a fire problem is to prevent it from happening in the first place. Prevention is much more cost-effective and will clearly reach greater numbers of people in a community. Fire risks have been drastically reduced over recent decades in many countries through the implementation of a range of evidence-based interventions using education, engineering changes, enforcement of legislative protection, and environmental modifications. This strategy has been further enabled by improved data gathering systems, new and more stringent legislation, social marketing, and advocacy. Volunteer groups have also played an important role, not only by providing much needed peer support but also through their campaigning and advocacy efforts.



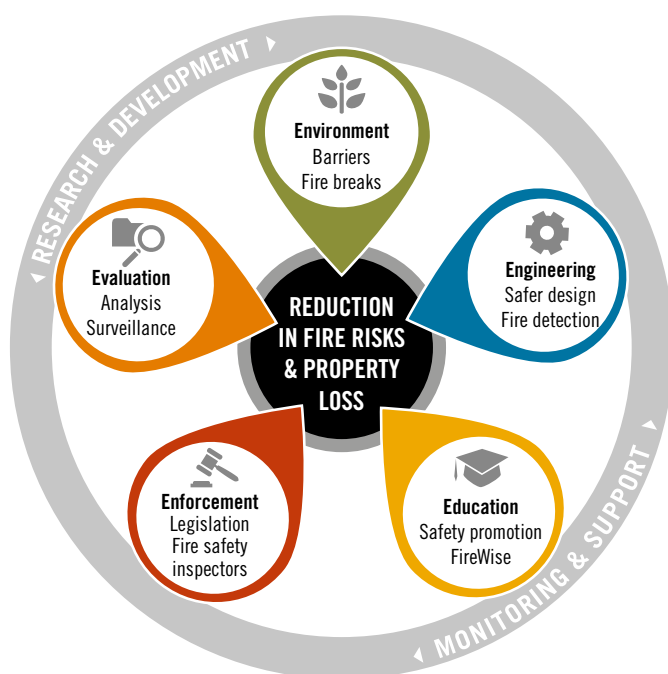
Awareness material in a fire prone area

14.4 Using an integrated approach to fire prevention

Decades of research and experience have demonstrated that fire-risk reduction requires a comprehensive integrated approach, with a combination of community-based activities supported by a regional infrastructure (national/provincial/local). The causes of fire-related risk factors are numerous and complex, and fire-prevention strategies are by necessity multifaceted and involve all sectors and many disciplines. Therefore, an integrated approach to fire prevention is essential. Each FPA has a duty to promote and protect the population within their jurisdiction by developing and implementing measures for the prevention of fire risks.

Fire-related risk is the consequence of a number of interconnected events that, when occurring together, provide the necessary conditions in which detrimental fires are more likely to occur. The reduction of fire-related risks relies on a comprehensive understanding of broad societal and community factors, as well as more localised factors at the household and individual level. The targeting and application of interventions at each of these levels could result in a more sustained and successful approach to fire risk reduction. This can be achieved by changing the individual (and their behaviour), the agent (person), or the environment by implementing evidence-based interventions that target vulnerable groups and their multiple environments.

INTEGRATED FIRE RISK REDUCTION STRATEGY



An integrated fire-risk reduction strategy encompasses environmental modifications, engineering, education, enforcement (including legislation), and evaluation.

-  **ENVIRONMENTAL** modifications focus on modifying the physical environment, e.g. separating fire-prone areas with barriers such as firebreaks.
-  **ENGINEERING** is directed at enhancing fire safety with equipment, e.g. sprinklers and smoke detectors.
-  **EDUCATION** involves the provision of training and information to improve fire safety.
-  **ENFORCEMENT** focuses on interventions that enforce fire safety legislation.
-  **EVALUATION** provides information to determine fire-risk reduction priorities and which interventions work.

14.5 Fire prevention campaigns



Preventative measures can reduce the risk of unwanted fire

or community-wide fire-related behaviours or how to initiate and sustain the positive behaviour change that is required.

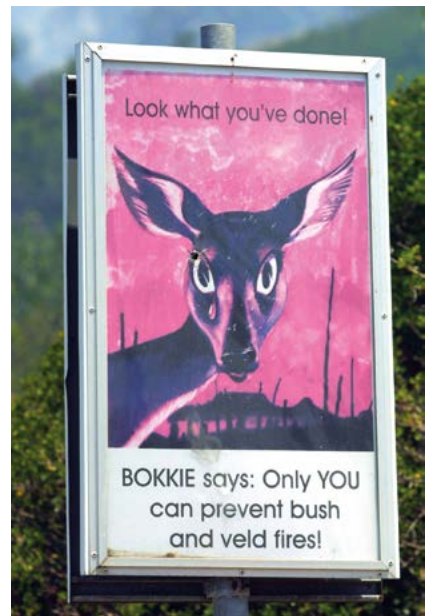
To be effective, selection of the most appropriate message must be situation-specific and depend on the specific target audience, the setting, and the characteristics of the behaviour to be changed. The understanding and application of theoretical models that will enhance the success of prevention interventions is of utmost importance.

This kind of strategy highlights the importance of combining behavioural and environmental approaches to fire prevention. Programmes using a combination of these interventions (e.g. education, engineering, enforcement) have achieved significant success in reducing community risk from fire.

Ultimately, in order to successfully reduce this risk, our interventions must include behaviour change strategies in order to establish and maintain the appropriate safety behaviour – by landowners, parents, children, decision makers, journalists, as well as firefighters.

Fire-prevention campaigns and activities often seem to be based on the assumption that simply changing people's awareness about the fire problem will change their behaviour. This is often referred to as the blanket approach, where the aim is to cover as wide an area or population as possible with the same message.

The general public are often unaware of the effectiveness of specific fire-prevention actions. This indicates the need for more effective public education regarding fire prevention. In addition, little attention is given to understanding the actual causes and influences affecting individual



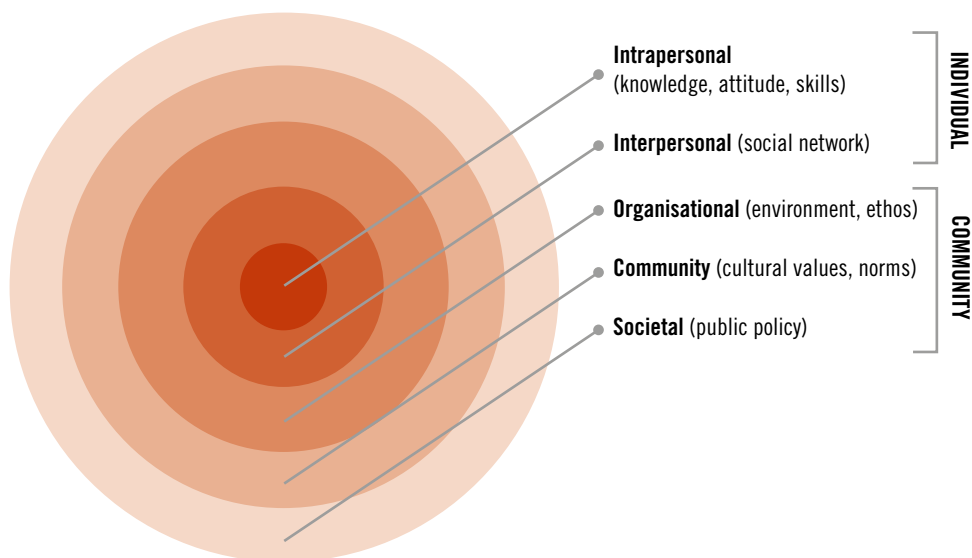
A uniform, wide spread message is proven to be more successful

14.6 The Systems Approach (Ecological model)

The ecological model is a useful concept to help understand the various levels within a community and how these levels are interconnected. It provides an organising framework that helps to systematically think about comprehensive approaches and the behaviour of multiple audiences. Systems thinking, which is the process of understanding how things influence one another within a whole, is central to ecological models. In this case, the system is the community.

It illustrates the dynamic interaction between behaviour and the environment (social and physical), and conveys the idea of multiple levels of influence on both individual-level and community-level factors in shaping high-risk and safety-related behaviours. In other words, the ecological model is not only beneficial in developing and implementing fire-prevention programmes, but also in identifying and understanding the fire risk factors within the population.

THE SYSTEMS (ECOLOGICAL) VIEW OF A COMMUNITY AND THE MULTIPLE LEVELS OF INFLUENCE



Multiple levels of influence

Within this perspective, human behaviour is viewed as being affected by, and affecting, multiple levels of influence. Behaviour both influences and is influenced by the social environment within a community. This multi-level, interactive perspective clearly shows the advantages of multi-level interventions, such as those that combine behavioural and environmental components (active and passive). Different intervention strategies and methods are available and must be integrated into an overall prevention strategy when working with individuals and communities.

Referring to the diagram, the first level is the **intrapersonal level**, which refers to the influence of an individual's knowledge, skills, attitudes, and beliefs on his or her own behaviour. Individual knowledge and skill, perception, and motivation (e.g. Maslow's hierarchy of needs), attitudes, and beliefs are relevant at this level.

Second is the **interpersonal level**, which refers to how people such as family members, friends, peers, co-workers, and significant others can influence the individual's behaviour. The social networks of the individual are an important influence at this level.

Often the intra and interpersonal levels are simply designated the "individual level." Interventions at this level could include activities incorporating educational programmes, training, counselling, skills development, and door-to-door campaigns.

The next level is the **organisational level**, which includes structures such as associations, institutions, workplaces, churches, pre-schools, and others that have rules and regulations that can influence individuals and groups.

The **community level** usually indicates a specific geographical area and incorporates the individuals in that area into a group that shares identity, values, norms and other societal influences. Social marketing campaigns are often used at this level.

The **societal level** represents larger systems, such as political, that have power and some level of control over communities. Other large societal influences include economic, educational, and social policies. Often policy development and implementation is used to influence change at this level.

These three levels can be viewed collectively as the community level. Interventions that focus on the use of social marketing using the mass media, as well as coalition building, community development, and poverty alleviation programmes are important here.

Community Risk Reduction programmes will have a better chance of success when the problems are analysed and programmes are planned, keeping in mind the various levels of influence in the ecological model. The higher levels (community, societal) are more difficult to change, but are more likely to be sustained when changed. For example, changing laws would be more difficult than changing an individual's knowledge, but when that law is enforced effectively over time, sustained behaviour change can occur.

14.7 IFM annual planning

The different components of Integrated Fire Management are interwoven and relevant throughout the year. However, the level of attention to each or the activities will vary according to the seasons and fire propensity.

Each fire biome should develop a month-by-month plan that schedules what pre-fire season activities are needed, what in-fire season activities are needed, and what post-fire season activities are needed, and to schedule them into the calendar of activities clearly specifying which stakeholder is responsible for what. For more details on what such a plan could look like, see the Western Cape annual plan.

14.7.1 IFM annual planner for the Fynbos Biome

		Landowner	FMU rep	FPA Mgr/Asst	FPO/CFO
July	Implement winter plant control operations on re-growth	x			
	Conduct pre-fire season self-assessment	x			
	Submit self-assessment forms to FPA manager	x			
	Classify and map fuel load status of all parts of the land	x			
	Inspect the condition of any power lines and power-line servitudes	x			
	Inspect the condition of road verges on private and adjoining public roads	x			
	Review firebreak plan	x			
	Conclude bilateral landowner agreements to relocate breaks	x			
	Prioritise firebreaks	x			
	Schedule dates for clearing of firebreaks	x			
	Prioritise proposed fuel reduction activities on property	x			
	Update equipment inventory	x			
	Attend pre-fire season Fire Management Unit meeting	x			
	Consolidate information on fuel loads		x		
	Discuss changes to firebreaks		x		
	Consolidate pre-season fire information for submission to FPA		x		
	Report on the condition of power servitudes and public road verges	x			
	Update FMU firebreak registers			x	
	Update FMU firebreak plan			x	
	Identify staff for fire management training	x			
	Implement fuel load reduction measures and stack burning – with a burning permit from FPA manager	x			
	Develop a training programme for drivers, crew leaders and proto teams			x	
	Arrange dates for staff training		x	x	
	Stack burning allowed if weather permits – get burning permit from FPA manager	x			

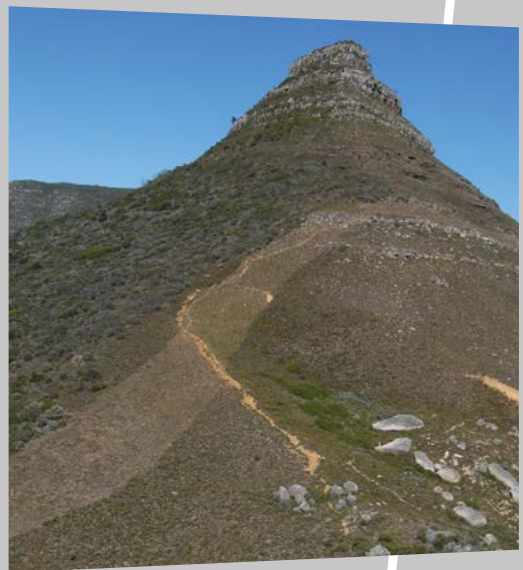
		Landowner	FMU rep	FPA Mgr/ Asst	FPO/ CFO
August	Finalise firebreak agreement with neighbours	x			
	Train employees in fire management	x			
	Implement fuel load reduction measures with a burning permit from FPA manager	x			
	Stack burning allowed if weather permits – get burning permit from FPA manager	x			
	Brush cut firebreaks	x			
	Attend pre-fire season FPA/District Fire Working Group meeting		x	x	x
	Consolidate district level fuel load and firebreak information			x	
	Update district firebreak plan			x	
	Identify resources available to assist with firebreak establishment			x	x
	Prioritise assistance with firebreaks		x	x	x
	Draw up action plan for non-conforming firebreaks		x	x	x
	Settle deployment of FPA resources		x	x	x
	Submit any applications for firebreak exemption to DAFF			x	
September	Update contact details of all neighbours	x			
	Check that water points have adequate supplies	x			
	Check if all tools conform to FPA standards	x			
	Ensure employees are trained in fire management	x			
	Consolidate contact details and settle after hours call out procedures with employees	x			
	Ensure firefighters have appropriate protective clothing	x			
	Implement action plan for firebreak preparation	x			
	Check insurance cover	x			
	Understand the obligations of your insurance warranties	x			
	Understand the legal implications concerning landowner liability	x			
	Stack burning allowed if weather permits – get burning permit from FPA manager	x			
	Brush cut firebreaks	x			
	Attend FMU meeting	x			
October	Settle FPA response plan			x	x
	No stack burning without a permit from FPO		x	x	
	Check all radios	x			
	Brush cut firebreaks	x			
	Brush cut roads bordering open areas and firebreaks	x			
	Ensure Eskom servitudes are cleared	x	x	x	
	Match your fire-fighting resources based on the fire risks identified	x			
	Obtain standby rosters from your neighbours	x			
	Obtain local FPA standard operating procedures related to high FDI periods	x			
	Controlled burn of open areas on rotational burning programmes with CFO permit	x		x	x
	Train your employees in fire management	x			
	Implement procedures to ensure the availability and supply of fuel, rations, etc., as and when required	x		x	

		Landowner	FMU rep	FPA Mgr/ Asst	FPO/CFO
October	Implement operational procedures to ensure quick response to provide medical, mechanical, protection, and other services	x	x		
	Implement a weekly vehicle checklist to ensure fire readiness	x			
	Obtain rules and regulations of the local FPA and FMU	x			
	Check that water points have adequate supplies	x			
November	TAKE EXTREME CARE WHEN BRUSH CUTTING BREAKS	x			
	Ensure Eskom servitudes are cleared	x		x	
	Ensure all public road verges are cleared	x		x	
	Develop all-risk prevention plan for each risk	x			
	Ensure that all-risk action plan is fully implemented	x			
	Start using readiness checklist	x			
	Ensure all fire-related training is completed	x	x	x	x
	Activate manual lookouts, if necessary	x			
	Brush cut firebreaks around homesteads	x			
	Undertake any controlled burns on a rotational burning programme with burning permit from CFO	x	x	x	x
	Check all your fire fighting vehicles comply with FPA standards	x			
	Remind all your staff of the dangers of cooking and heating fires, smoking, etc.	x			
	Issue Personal Protective Equipment to all your fire fighting staff	x			
	Make sure that all fire staff have been for their annual medical check-up	x			
	Make sure that all staff are familiar with local FPA response plan	x			
	Check that all access roads are graded and accessible	x			
	Attend FMU meeting	x	x	x	
December	Folio spraying of any plant re-growth	x			
	Identify (mark) completed firebreaks on a map	x	x		
	Brush cut ("skoffel") final firebreaks as per your plan	x			
	Ensure Eskom servitudes are cleared	x	x	x	
	Advise all staff of call-out and dispatch protocols	x			
	Perform weekly checks of all equipment, using checklists	x			
	Perform checks to ensure readiness and quick reaction at all times	x			
	Obtain FDI forecast on a daily basis from your local FPA	x			
January	Distribute your standby rosters to all neighbours	x			
	NO MORE BRUSH CUTTING ALLOWED	x			
	Folio spraying of any invasive plant regrowth	x			
	Advise all staff of call-out and dispatch protocols	x			
	Perform weekly checks of all equipment, using checklists	x			
	Obtain FDI forecast on a daily basis from your local FPA	x			
	Distribute standby rosters to all neighbours	x			
	Perform checks to ensure readiness and quick reaction at all times	x			
	Attend mid-fire season FPA/District Fire Working Group meeting		x	x	x
	Study weather systems and check forecasts on the internet	x			

		Landowner	FMU rep	FPA Mgr/Asst	FPO/CFO
February	NO MORE BRUSH CUTTING ALLOWED	x			
	Advise all staff of call-out and dispatch protocols	x			
	Obtain FDI forecast on a daily basis from your local FPA	x			
	Perform weekly checks of all equipment, using checklists	x			
	Perform checks to ensure readiness and quick reaction at all times	x			
	Distribute your standby rosters to all neighbours	x			
	Study weather systems and check forecasts on the internet	x			
	Attend FPA Annual General Meeting to fix membership fees, etc.		x	x	x
March	NO MORE BRUSH CUTTING ALLOWED	x			
	Obtain FDI forecast on a daily basis from your local FPA	x			
	Perform daily and weekly checks of all equipment, using checklists	x			
	Perform checks to ensure readiness and quick reaction at all times	x			
	Distribute your standby rosters to all neighbours	x			
	Attend FMU meeting	x	x	x	
	Study weather systems and check forecasts on the internet	x			
April	NO MORE FIREBREAK BURNING ALLOWED	x			
	Obtain FDI forecast on a daily basis from your local FPA	x			
	Perform daily and weekly checks of all equipment, using checklists	x			
	Perform checks to ensure readiness and quick reaction at all times	x			
	Distribute your standby rosters to all neighbours	x			
	Study weather systems and check forecasts on the internet	x			
May	Stack burning allowed if weather permits – get burning permit	x			
	Keep monitoring FDI	x			
	Study weather systems and check forecasts on the internet	x			
	Attend FMU meeting	x	x	x	
	Implement winter plant control operations on re-growth	x			
	Attend FPA/District Fire Working Group post fire season meeting		x	x	x
June	Stack burning allowed if weather permits – get burning permit from FPA	x			
	Implement winter plant control operations on re-growth	x			
	Start to plan for the next fire season	x			

CHAPTER FIFTEEN

FIREBREAKS





15 FIREBREAKS

15.1 Are landowners legally obliged to create firebreaks?

Section 12(1) of the National Veld and Forest Fire Act provides that:

“Every owner on whose land a veldfire may start or burn or from whose land it may spread must prepare and maintain a firebreak on his or her side of the boundary between his or her land and any adjoining land.”

Section 13 provides further that:

An owner who is obliged to prepare and maintain a firebreak must ensure that, with due regard to the weather, climate, terrain and vegetation of the area:

- it is wide enough and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land;
- it does not cause soil erosion; and
- it is reasonably free of inflammable material capable of carrying a veldfire across it.

In addition to the statutory duty to create a firebreak established by the NVFFA, landowners have a common-law duty to conduct themselves in such a way that they do not cause harm to others. Part of this duty, it is argued, requires landowners to reduce the fuel loads on their properties to reasonable levels and another part, regardless of the provisions of any legislation, is that they take reasonable measures to prevent the spread of wildfires to adjoining properties.

15.2 What is the purpose of a firebreak?

Within the Fynbos Biome where wind-driven fires can spot up to a kilometre ahead of the fire line, it would appear that the principle purpose of a firebreak is:

- to provide an area of reduced fuel load which will reduce the intensity of a fire and therefore allow for more effective combatting; and
- to then also serve as a line from which a back burn can be started.



Cutting firebreaks in a plantation



Extending the width of firebreaks by burning road verges

15.3 Where should firebreaks be located?

In deciding where a firebreak is to be located, the point of departure is Section 12(1) of the National Veld and Forest Fire Act, which requires that it be located on the boundary between landowners. However, if a firebreak is to serve as a point for fire control, the location of the break needs to be dictated by fire management considerations and not by the linear location of property boundaries. In addition, in order to ensure that available resources are allocated in the optimal fashion, the rationalisation of firebreaks helps to reduce costs.

Section 11(7) allows for such rationalisation by providing as follows:

- a. “Owners of adjoining land may agree to position a common firebreak away from the boundary.”

 *The Bilateral and Multiple Landowner Agreement Forms* can be completed for implementation between two or multiple landowners.

The Minister does not need to approve such an agreement between two owners to reposition a firebreak. However, it is recommended that:

- a) landowners collectively sign an agreement containing a plan of the revised firebreak;
- b) landowners inform their FPAs of any proposed realignment of firebreaks; and
- c) if possible, the FPA approves the realignment as part of its Integrated Fire Management plan.

Section 15 further allows the Minister to grant landowners exemptions from the duty to prepare and maintain firebreaks by providing as follows:

- “ (1) The Minister may exempt any owner or group of owners from the duty to prepare and maintain a firebreak or firebreaks for good reason.
- (2) The exemption may be subject to conditions.
- (3) The Minister must consult the fire protection association for the area, if any, before Section granting any exemption”.

 *The Firebreak Exemption Application Form* for individual or groups can be submitted to the Minister to implement this provision.

15.4 What is the procedure for optimal firebreak planning?

Pre-season fire planning should:

- identify the Wildland-Urban Interface;
- identify the areas of highest risk;
- identify the optimal location of firebreaks;
- prepare a map of the proposed firebreak locations;
- prioritise establishment and maintenance of the different firebreaks; and
- members of the FPAs should then conclude a multi-party agreement adopting the firebreak plan.

FAQ: Should landowners who have agreed to realign their firebreaks apply for exemptions from the Minister?

Generally, it is incumbent on landowners to both comply with the requirements of the statutes that regulate the management of wildfires and to also ensure that they do not act negligently. Landowners who engage in Integrated Fire Management, which includes the planning of firebreaks, particularly if it is done in conjunction with an FPA, and who then proceed to implement that plan, are taking a significant step towards ensuring that they protect themselves against subsequent civil claims.

An agreement between different landowners that approves the relocation of firebreaks will not only limit civil claims between these landowners but will also further support an argument that the landowner acted reasonably in the circumstances.

Getting the Minister to grant an exemption will not insulate a landowner from allegations of negligence. However, it will counter any argument that the landowner did not comply with a statutory duty created by the Act.

15.5 What is the approximate costing of a firebreak?

The following table sets out a guideline of costs for firebreak establishment and maintenance within the Fynbos Biome (as at 2014).

Veld age	Cost/m ²
0-5 yrs.	R 1.20
6 -11 yrs.	R 1.80
12+	R2.50
Thick bush	R3.00
Average belt width	15 meters
Circum-peninsula belt maintained annually: R1.5m - 130kms@20m/ 15m	R0.58/0.76

15.6 Who determines how broad a firebreak should be?

The law does not specify the size of a firebreak or the best way of creating them as conditions vary greatly across the country.

 Many of the FPAs have developed *firebreak guidelines* to assist members to create appropriate firebreaks. The guidelines are based on the following considerations:

- providing for vehicle access, based on the type of vehicle needed in the terrain;
- the nature of the vegetation in which they occur; and
- the type of fire suppression activities that can be managed from the firebreak.

15.7 What does “maintaining a firebreak” mean?

According to the NVFFA a firebreak has to be “reasonably free of flammable material capable of carrying a veldfire across it”. If the firebreak becomes overgrown, it is no longer an effective firebreak. This means that the firebreak has to be regularly cleared in order to prevent a wildfire from spreading. FPAs may set rules with regard to establishing firebreaks and state that the firebreak must either be burnt or cleared sufficiently to ensure flammable material is at its absolute minimum.

15.8 What happens if a landowner fails to create appropriate firebreaks?

The first step is to try to resolve the matter cordially between neighbours.

- If the landowner is a member of an FPA, the second step is to inform the FPA who may decide on an appropriate sanction, which may include suspension of FPA membership.
- If all else fails, the landowner can be reported and in terms of the NVFFA penalised. Such enforcement is the responsibility of Fire Protection Officer complying with Section 26 of the NVFFA.

The NVFFA provides expressly as follows:

1. “25(3) Failure to [create a break] is a criminal offence”.

The penalty for failing to create a firebreak is either a fine or imprisonment.

15.9 Are you required to cut firebreaks through indigenous vegetation?

Legally, yes. Landowners are obliged to create firebreaks regardless of the land use. The environmental losses will need to be weighed up against the costs of a court case and claim against the landowner in the event of a runaway wildfire onto their neighbours’ land.

In some instances, indigenous vegetation can be incorporated as a natural firebreak or as a buffer zone in a fire management plan, which is submitted to the Minister for approval. In addition, it is possible to either realign a break by agreement or apply for an exemption as detailed above in order to avoid indigenous vegetation, if appropriate.

15.10 Fuel load management

Many ecosystems are prone to fires and have adapted to them, and fires are necessary to maintain the health of these ecosystems. However, fires also pose a threat to human life, infrastructure and livestock. This is especially true of areas where significant development has taken place within or adjacent to such fire-prone ecosystems. The management of fires in these areas is often characterised by both uncertainty and conflict, particularly as the conservation of biodiversity and the maintenance of ecosystem health typically requires the judicious use of fire, often by means of prescribed burning.

Managing fuel loads is an integral part of managing wildfire risk. The nature of the risk will be dependent on the different fuel types and the age of the vegetation. Reducing fuel loads may be desirable in terms of reducing immediate wildfire risk but it may have other harmful impacts, particularly in the damage it can cause to ecological systems. Wildfires happening too frequently may result in species loss, habitat loss, and adverse impacts on water sources and sponges. This can affect ecological functioning, which can then in turn impact on human health and well being, and economic production. In the circumstances, it is necessary to manage fuel loads to limit the impact of harmful wildfires.

15.10.1 Is there any legislation that compels landowners to reduce fuel loads?

The NVFFA does not create a specific provision requiring landowners to reduce existing fuel load on their land although it might be possible to argue that the duty that exists on a landowner to prevent a fire from spreading from their land includes a duty to remove excessive fuel that will encourage that spread.

Invasive alien plant species generally increase fuel loads and fire intensities, and this will be in proportion to their density. The Conservation of Agricultural Resources Act (Act No 43 of 1983) (CARA) was promulgated to provide for control over the utilisation of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources, and the vegetation, and the combating of weeds and invader plants.

Many of the invasive plant species that adversely affect fire management are listed in terms of Regulations 15 and 16 of the Conservation of Agricultural Resources Act of 1983 as species that need to be removed or actively controlled. The failure to do so is a criminal offence.

Some local authorities invoke nuisance by-laws in order to compel landowners to reduce fuel loads.

To view the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) Alien and Invasive Species Regulations, 2014 – Page No.3, No. 37885 online, visit www.gpwonline.co.za. It can be argued that in terms of the common law, landowners have a duty of care that requires them to remove fuel loads that create an unreasonable fire risk, and that can lead to foreseeable damage should it burn.

In addition, most FPA rules require of landowners that they comply with the risk mitigation measures contained in the FPA's fire management plan. Failure to do so can result in suspension of membership.

Offending landowners should be notified in writing of their legal responsibilities and the possible consequences for their failure to discharge them.

15.10.2 How are fuel loads reduced?



Prescribed burning is common practise that reduces fuel loads over wide spread areas

Having identified fire hazards that exist within a particular area, the areas of greatest risk and the areas where management of fuel loads is to be prioritised, Integrated Fire Management needs to identify the means by which this is to be done. The primary methods are:

- mechanical means; and
- prescribed burning.

As far as mechanical means of fuel load reduction in wildfire prone areas are concerned, the national government, through the Department of Environmental Affairs, has embarked on a number of programmes.

- The Working on Fire Programme in terms of which the Department, pursuant to a public tender process, has contracted a single private entity to implement a national wildfire management programme that incorporates certain aspects of fuel reduction. Increasingly this is being driven through the FPAs.
- The Landowner Incentive Programme, which involves a number of non-governmental organisations acting as the implementing agents for the Department to engage with private landowners to embark on natural resource management initiatives, including fuel reduction measures. Increasingly this is being done through co-funding from the landowners.

Both these programmes focus on labour-intensive interventions that form part of the government's broader job creation programme.



Firebreaks serve as a line from where a back burn can be started

15.11 What is the procedure for optimal planning of fuel load reduction?

Pre-season fire planning involves a number of checks.

1. Identify the different plant types, fuel types, and fuel age.
2. Identify the areas of highest risk.
3. Integrate fire risk into an invasive alien vegetation control programme.
4. Identify the methods for fuel load reduction in areas of highest risk.
5. Identify funding sources to assist with fuel load reduction.
6. Schedule a timetable for fuel load reduction activities.
7. Identify a programme for managing of any regrowth of plants.

15.12 Prescribed burning

Prescribed burns are fires that are planned to reduce fuel load. They are deliberately ignited with the intention of burning a predetermined area.

15.12.1 Relevant legislation

Prescribed burns must be aligned with relevant legislation and regulations. The Conservation of Agricultural Resources Act (CARA) contains provisions dealing with prevention and controlled veldfires. The National Veld and Forest Fire Act (NVFFA) provides for FPAs to develop rules for burning veld. These must not contradict the procedures set up in CARA. Any soil disturbance is subject to CARA. Owners should ensure that firebreaks are positioned and prepared in such a way as to cause the least disturbance to soil and biodiversity.

Finally, the Atmospheric Pollution Prevention Act is applied by some local authorities to smoke that is caused by management practices, such as prescribed burns.

15.12.2 CARA burning permit

Regulation 12 of the Conservation of Agricultural Resources Act has the following provision relating to the prevention and control of wildfires and the burning of veld, and provides as follows:

“12. (1) Except on authority of a written permission by the executive officer, no land user shall –

- (a) burn any veld on his farm unit; and
- (b) utilise as grazing any veld on his farm unit that has burned.”

“Veld” is defined in the CARA regulations as land that is not being or has not been cultivated and on which indigenous vegetation, or other vegetation that, in the opinion of the executive officer, is or can be utilised as grazing for animals, occurs.

An application for a permission to burn in terms of section 12(1) must be:

- made by the land user of the farm unit;
- made on a form obtainable from an extension officer for this purpose;
- lodged at the extension office for the area within which the farm unit concerned is situated; and
- submitted at least 30 days prior to the intended date of burning.
- The following are preconditions for the issuing a burning permission in terms of CARA:
 - a. it must not be issued unless the executive officer is satisfied that the burning of veld is an accepted veld management practice in the area within which the farm unit concerned is situated, or that exceptional circumstances prevail on the farm unit concerned;
 - b. it may only be issued if the veld concerned is to be burned during periods of which particulars are available at the extension office concerned;
 - c. it is issued subject to the provisions of the *Forest Act* (Act 72 of 1968).

15.12.3 Local authority by-laws

Most local authorities have by-laws relating to atmospheric pollution and further restricting the lighting of fires in the open, without a permit.

15.12.4 What is the procedure for obtaining a burning permit?

A permit to carry out a prescribed burn should be issued for a period rather than a particular day, and the decision of the particular day on which to carry out the actual burn should be determined by weather conditions.

The procedure for obtaining a burning permit differs from one district to another. The most common scenarios appear to be the following:

- The Chief Fire Officer retains the responsibility for issuing individual permits.
- The CFO grants a general authorisation to carry out prescribed burns during a particular period, subject to certain conditions, including the condition that the Fire Protection Officer must approve the day on which the burn is carried out.
- The FPO is delegated the responsibility for issuing the permits.

The actual procedure for permit applications differs from region to region.

 *A burning permit application for Prescribed Burning* is included by way of example.

NOTE: Each application is customised so please check with your local authority. Further, some authorities charge a tariff for the permit. The permitting authority is required to check all prescribed burns.

 *A Burn Inspection Report and GIS map* is included by way of example.

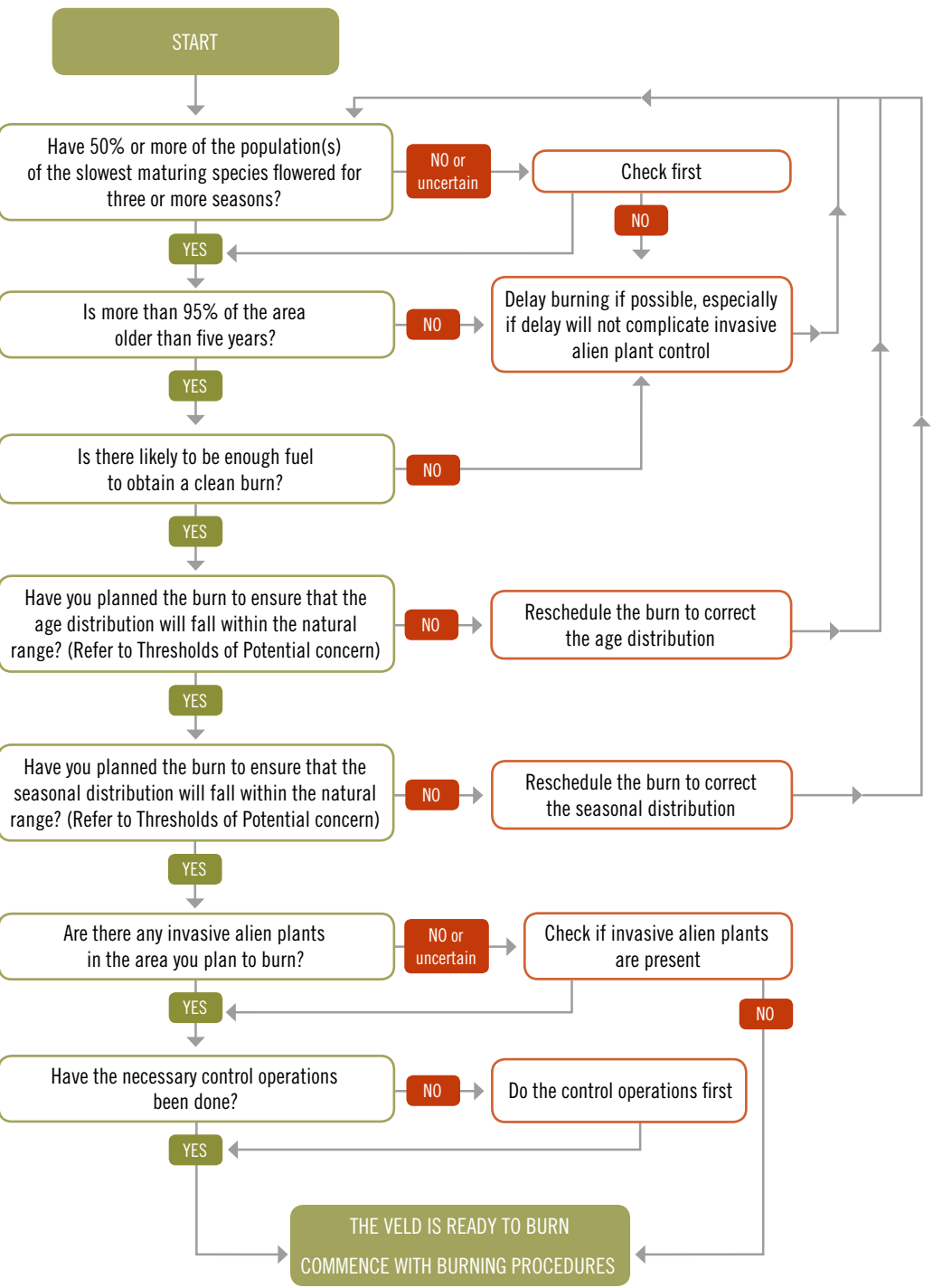
15.13 Who is responsible for managing a prescribed burn?

The landowner is always responsible for managing a prescribed burn and must be present at the time of the burn.

15.14 Decision matrix for deciding whether to undertake a prescribed burning

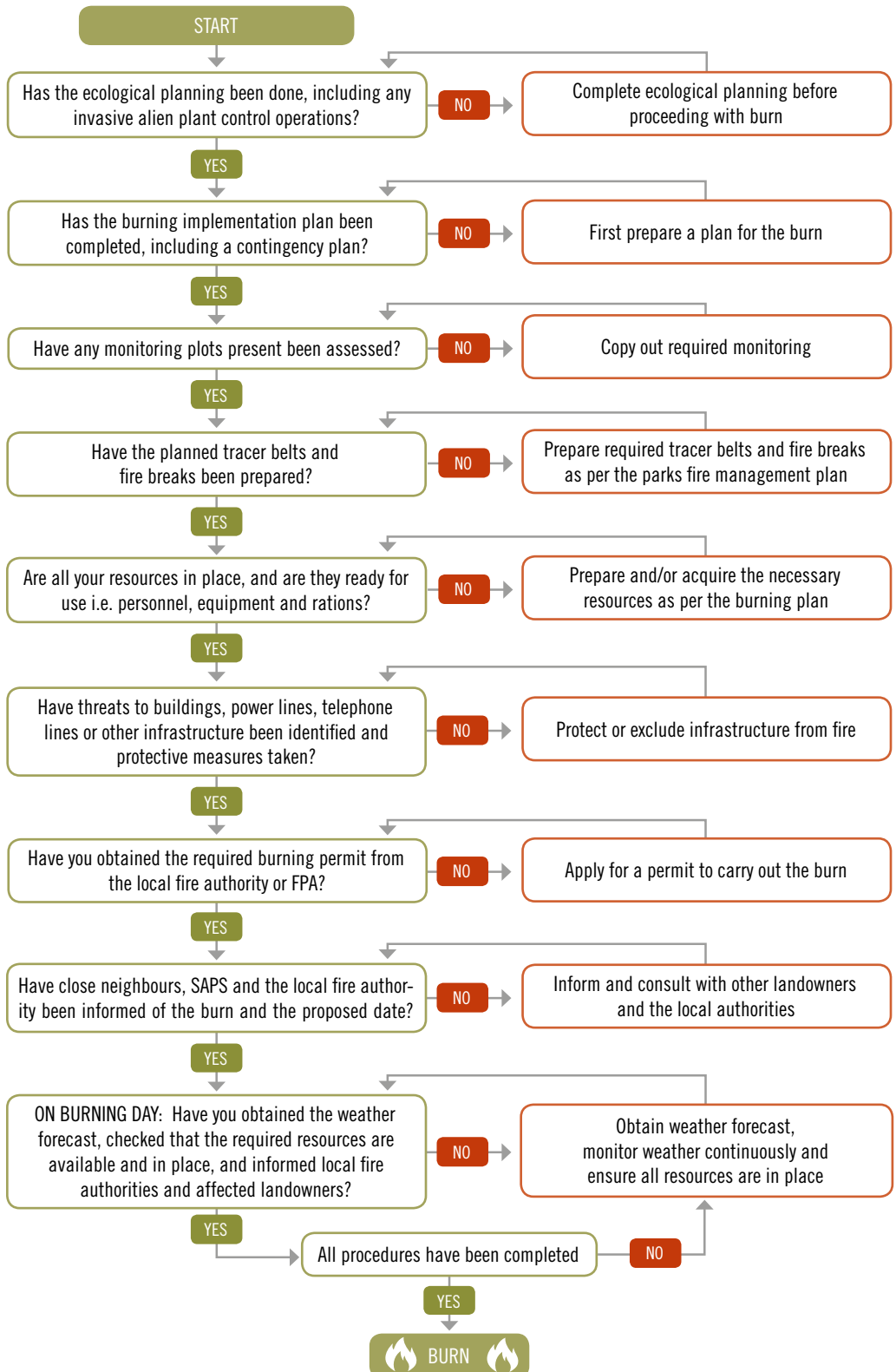
PROCEDURES FOR PRESCRIBED BURNING

FLOW CHART FOR THE ECOLOGICAL CRITERIA THAT MUST BE MET FOR A PRESCRIBED BURN



PROCEDURES FOR PRESCRIBED BURNING

PROCEDURES TO BE CARRIED OUT BEFORE EXECUTING A PRESCRIBED BURN IN AN AREA



15.15 Fire danger rating and early warning systems

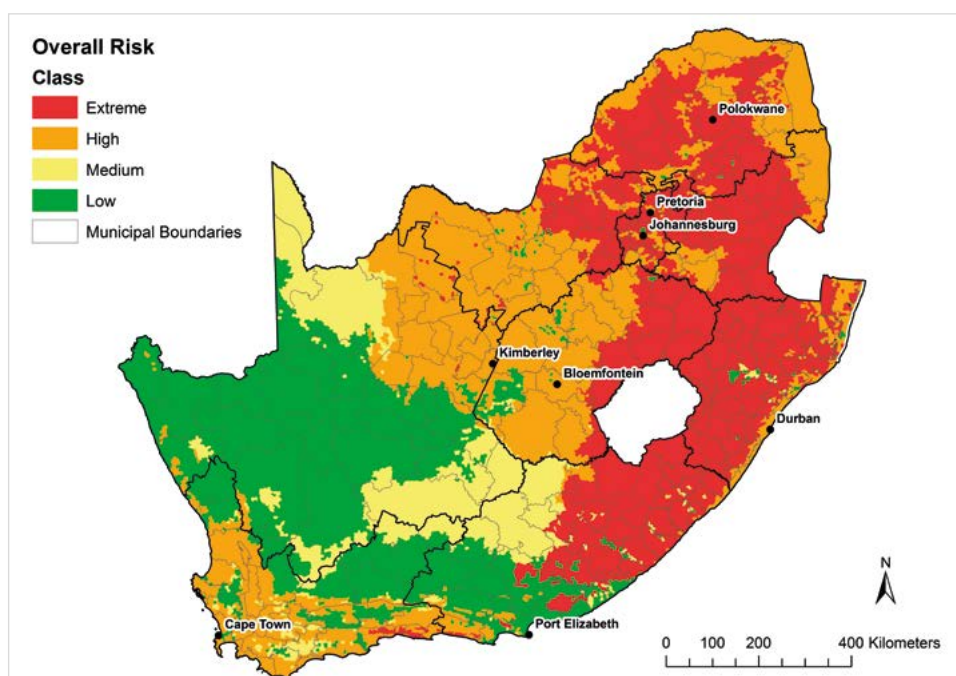
15.15.1 What is the Fire Danger Rating?

Understanding the likelihood of a fire occurring and the consequential dangers is key to effective fire management and the development of an early warning system. It aims to increase the ability of the general public and of FPAs to manage wildfires by being aware of the probability of a wildfire occurring in a particular area at a specific time.

The National Veld and Forest Fire Act (Act 101 of 1998) provides for the deployment of a National Fire Danger Rating System (NFDRS). Such a system did not exist at a national level when the Act was passed although localised fire danger rating systems were used in some regions. A NFDRS was then developed.

The whole of South Africa was divided into 42 different areas - each having distinct fire conditions. Within each of these areas information about the nature of the flammable fuel is combined with the daily weather forecast to provide a projection of the fire danger. The forecast is then entered into a Fire Danger Rating table. This gives the Fire Danger Index for a particular day.

15.15.2 National veldfire risk map

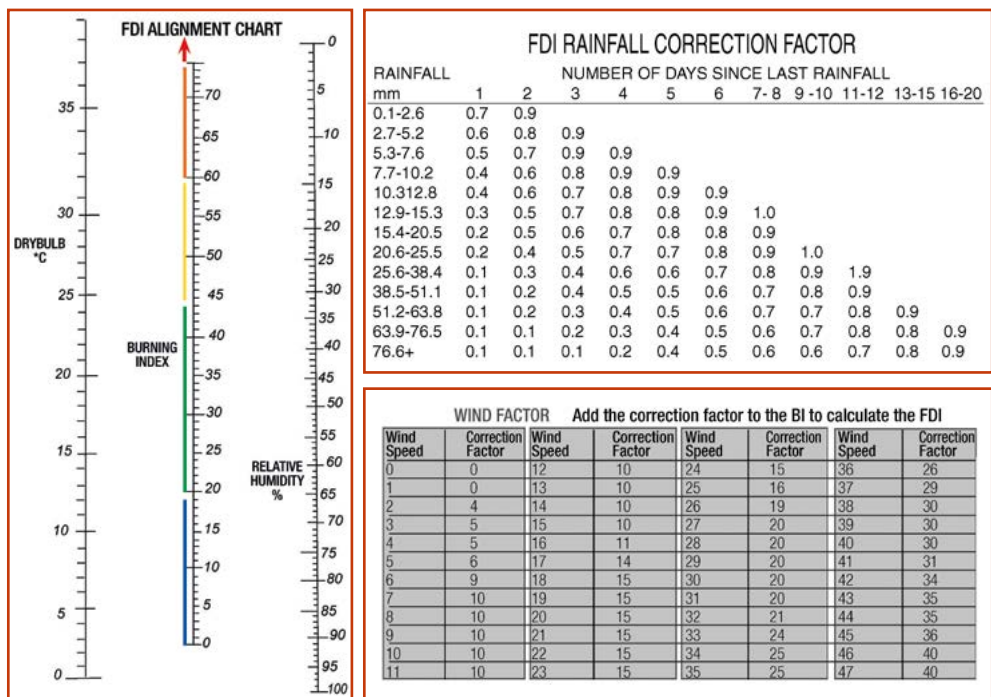


15.15.3 How is the Fire Danger Rating determined?

A combination of the temperature, wind direction and speed, and rainfall and humidity is used to determine the fire danger rating. This can be calculated manually or using technology.

For a manual calculation you need to:

- check the temperature outside at 10h00 and 14h00 daily;
- measure the rainfall daily at 10h00;
- calculate the relative humidity; and
- measure the wind speed in km/hr.



Using the *FDI Alignment Chart*, place a ruler between the temperature and the humidity readings.

This will give you the **burning index**.

Add a wind correction factor using the *Wind Factor wind correction table*.

This gives you the **Fire Danger Index (FDI)** if there is no rain.

If there is rain then you need to correct this with the *FDI Rainfall correction table*. This adjusts the index based on the number of days since the last rainfall - the longer the number of days, the higher the danger.

15.15.4 What is the Fire Danger Rating Table?

The Fire Danger Rating Table is colour coded. The table classifies fire danger into five categories below and provides an overview of the prevention and preparedness measures needed.

FDI Description	Colour		Lowveld FDI Precaution
SAFE	BLUE	0 - 20	Low fire hazard. Controlled burn operations can normally be executed with a reasonable degree of safety.
MODERATE	GREEN	21 - 45	Although controlled burning operations can be executed without creating a fire hazard, care must be taken when burning on exposed, dry slopes. Keep constant watch for unexpected wind speed and direction changes.
DANGEROUS	YELLOW	46 - 60	Controlled burning not recommended when fire danger index exceeds 45. Aircraft should be called in at early stages of a fire.
VERY DANGEROUS	ORANGE	61 - 75	No controlled burning of any nature should take place. Careful note should be taken of any sign of smoke anywhere, especially on the upwind side of any plantation. Any fire should be attacked with maximum force at hand, including all aircraft at the time.
EXTREMELY DANGEROUS	RED	75<	All personnel and equipment should be removed from the field. Fire teams, labour and equipment placed on full standby. At first sign of smoke, every possible measure should be taken to bring the fire under control in the shortest possible time. All available aircraft should be called for without delay.

15.15.5 How is the Fire Danger Index normally communicated?

The Fire Danger Ratings are normally communicated to Fire Protection Associations and to Chief Fire Officers. Warnings of possible wildfires may be communicated by local weather offices or disaster management centres. In the case of high or extreme fire risk, this may also be communicated together with the weather report on radio and television.

The daily Fire Danger Index can be viewed at <http://www.forestry.co.za/fire-danger-index/>.

It is recommended that FPAs provide a daily FDI report to members as part of their service. It is also possible to subscribe to various services providing the actual and forecast FDI by daily SMS.

Fire Danger Index and weather forecast for the Kou-Kamma/Joubertina and Kannaland/Ladismith Districts

Forecast for Sat 6 Feb 2016	Min Temp (C)	Max Temp	Max Hum (%)	Min Hum (%)	Prob Rain %	Rain (mm)	Lowveld FDI-D	Lowveld FDI-W
Kou-Kamma/Joubertina	12	37	90	35	0	0	66	59
Time	Temp C	Weather		Wind Speed		Wind Gusts		
08:00	20	Clear skies		NNE 19 km/h		0 km/h		
14:00	31	Clear skies		SE 9 km/h		0 km/h		
20:00	21	Partly cloudy		SW 9 km/h		0 km/h		
Forecast for Sun 7 Feb 2016	Min Temp (C)	Max Temp	Max Hum (%)	Min Hum (%)	Prob Rain %	Rain (mm)	Lowveld FDI-D	Lowveld FDI-W
Kou-Kamma/Joubertina	16	26	90	60	0	0	51	51
Time	Temp C	Weather		Wind Speed		Wind Gusts		
08:00	19	Clear skies		NNE 19 km/h		0 km/h		
14:00	26	Clear skies		SSW 19 km/h		0 km/h		
20:00	19	Partly cloudy		S 9 km/h		0 km/h		

Forecast for Sat 6 Feb 2016	Min Temp (C)	Max Temp	Max Hum (%)	Min Hum (%)	Prob Rain %	Rain (mm)	Lowveld FDI-D	Lowveld FDI-W
Kannaland/Ladismith	17	39	70	10	0	0	82	82
Time	Temp C	Weather		Wind Speed		Wind Gusts		
08:00	23	Clear skies		NNE 9 km/h		0 km/h		
14:00	36	Clear skies		SW 19 km/h		0 km/h		
20:00	27	Clear skies		SW 19 km/h		0 km/h		
Forecast for Sun 7 Feb 2016	Min Temp (C)	Max Temp	Max Hum (%)	Min Hum (%)	Prob Rain %	Rain (mm)	Lowveld FDI-D	Lowveld FDI-W
Kannaland/Ladismith	19	27	80	45	0	0	63	63
Time	Temp C	Weather		Wind Speed		Wind Gusts		
08:00	21	Partly cloudy		S 9 km/h		0 km/h		
14:00	27	Partly cloudy		SSE 19 km/h		0 km/h		
20:00	23	Cloudy		SSE 19 km/h		0 km/h		

CHAPTER SIXTEEN

DETECTION, COORDINATION, AND SUPPRESSION





16 DETECTION, COORDINATION, AND SUPPRESSION

16.1 Fire detection

Fire detection is an important part of an effective fire management programme. It can be accomplished in a variety of ways through fire observation towers, monitoring and reporting by community members, aerial surveillance or satellite electronic detection systems.

16.1.1 Manual detection systems

As stated in the section on stakeholder mobilisation, active and informed citizens are a key resource for fire detection and provide the backbone of a manual detection system. Prior to the electronic systems, FPAs and fire services relied on reports of smoke or fire from citizens. Commercially, manual detection systems used on forestry stations included lookout posts, in addition to what is observed on the ground.

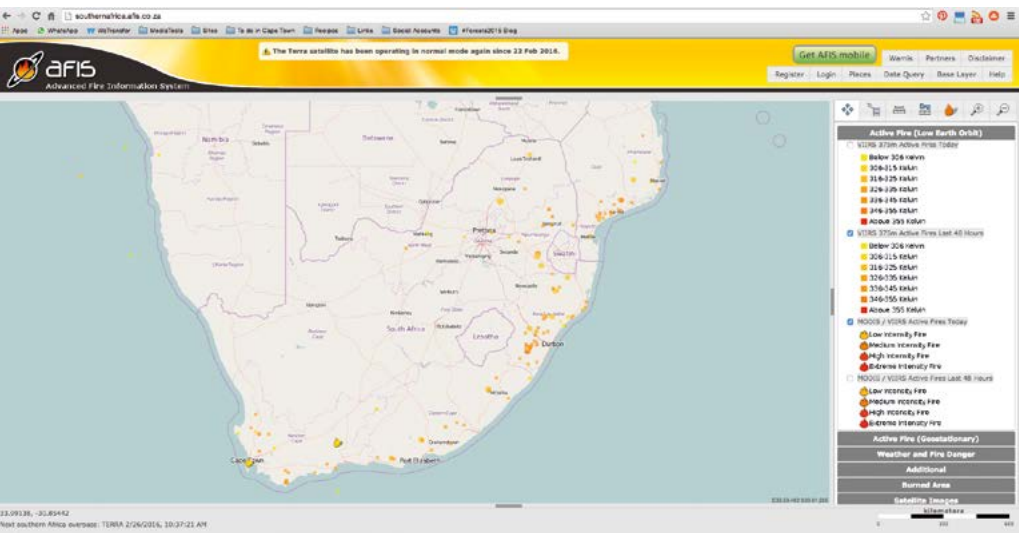
 As an example, see the template *Smoke Report Form*.

16.1.2 Electronic detection systems

Smart technology is being used to detect wildfires by South African FPAs. The system used was developed by the Council for Scientific and Industrial Research (CSIR). It offers real-time SMS alerts and email messages of fire observations made by satellite camera. The data is stored in a portal and distributed via terminals, which enable viewers to see maps of fires in real-time in any part of the country. Called the Advanced Fire Information System (AFIS).

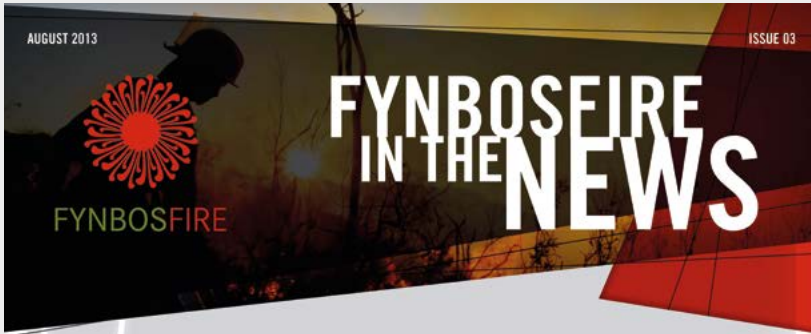


The Firehawk wildfire detection camera scans a full 360 degrees in under four minutes



Advanced Fire Information System (AFIS)

Using technology (AFIS) to curb runaway fires



Space-age technology helps to curb runaway wildfire

By Jo-Anne Smetherham

Smart ways of preventing runaway wildfires from causing widespread destruction will be needed as climate change raises temperatures and creates larger tracts of tinder-dry veld.

These smart methods already exist, and many are being used by South Africa's best Fire Protection Associations (FPAs).

They include the use of space-age technology to detect wildfires and the risk they will occur; controlled burns to create buffer zones that protect property and vulnerable young veld; and moves by the insurance industry to educate landowners and encourage them to follow best practice in fire management.

"There are three things that are unavoidable: death, taxes and wildfire," says Tony Marshall of CapeNature, whose 780 000 hectares of nature reserves flank the properties of hundreds of landowners, as well as most municipalities in the Western Cape. "However, wildfire can be managed through pre-emptive preparations."

The observations streaming

down from satellites orbiting the earth includes data on wildfire. In 2004, remote sensing specialist Philip Frost at the Council for Scientific and Industrial Research (CSIR) began developing an information system that could receive, process and distribute this data.

His "Eureka" moment has been a massive boost for wildfire detection and prevention in South Africa and worldwide.

At the time, Frost and his CSIR team were working with Eskom, which was experiencing large numbers of line faults due to fire. In world-first research, the scientists worked out a way of turning observations of large fires into real-time SMS alerts and email messages. On average, over 30 000 SMS fire alerts are sent out per fire season to FPAs and Eskom.

"The technology allows FPAs to detect fires and respond immediately, instead of having to wait until someone smells the smoke, which may well be too late," says Frost.

The data is on the Advanced Fire Information System web-

site (www.afis.co.za), permitting viewers to see maps of fires in real time in any part of the world, for any period, using Google Maps as a backdrop. Monthly estimates of the area burnt and weekly fire danger maps are also distributed to the hundreds of fire managers in South Africa. The data is distributed through AFIS field terminals installed across the Eastern and Western Cape.

The CSIR forecasts of fire risk also enable fire managers to assess the best conditions for doing block burns, which create buffer zones next to valuable property, crops and plantations, and burn old vegetation that needs rejuvenating. "These burns are a crucial component of fire risk management and they have been happening, although not to the extent we would like," says Marshall.

"There is a risk in doing these block burns," he says. "I'm scared of fire, and property owners are probably even more scared. But there is a far greater risk if we don't do them."

"These burns need to done

16.2 The Incident Command System

The increased risk of fire can rapidly exceed the fire fighting capabilities of local municipalities. Without a system to coordinate and manage fire fighting resources from surrounding jurisdictions, various government departments and private agencies, the rapid spread of fire could increase beyond local coping capacities.

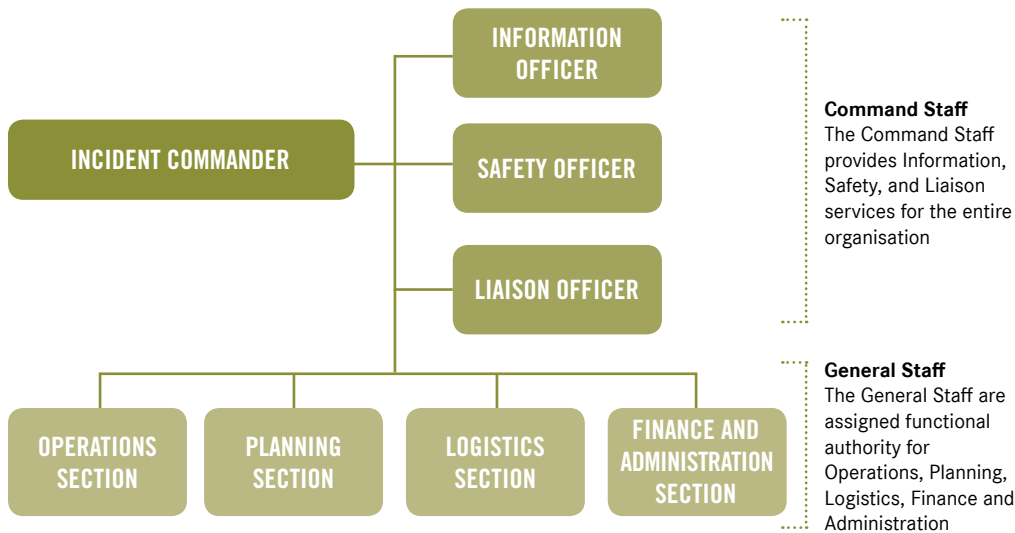
An Incident Command System and the sharing of resources, supported by well-trained staff with clearly defined roles and responsibilities within their statutory parameters, are key to the effective mitigation of large-scale incidents. An Incident Management System can therefore not exist in isolation and must form an integrated part of a unified framework.

The Incident Command System (ICS) is an emergency management tool that is used in South Africa by all types and levels of emergency services, to ensure standardisation and efficiency in resolving the situation. ICS is designed to ensure optimal cooperation and communication between different organisations at any incident. To achieve this, ICS integrates facilities, equipment, personnel, procedures, and communications operations within a common organisational structure. Every ICS has a single person who has final authority on all decision-making. This works on a “first-on-scene” basis, where the first responder to an incident is the Incident Commander (IC) until the incident has been declared resolved or the IC transfers command to someone else with more authority and/or capacity to deal with the incident. The Incident Commander can delegate tasks to individuals or an Incident Command team. This team will grow in size with the increase in size and complexity of an incident.



An ICS team with clearly defined roles is used to mitigate large-scale incidents

Fires fall under emergency services and are managed through an ICS. No two fires will be exactly the same and each fire will involve different stakeholders with different capacity and authority. However, a good incident command system will assume that many aspects of a fire fighting operation will be the same at every incident. Below is a generic ICS structure.



ICS is used by all levels of government - national, provincial, district, and local - as well as by many non-governmental organisations and the private sector. ICS is also applicable across disciplines. It is typically structured to facilitate activities in five major functional areas: Command, Operations, Planning, Logistics, and Finance & Administration.

As a system, ICS is extremely useful, providing an organisational structure for incident management and guiding the process for planning, building, and adapting that structure. Using ICS for every incident or planned event helps hone and maintain the skills needed for the large-scale incidents.

For ICS to work, each participant must be committed to working together to solve a common problem. Each responding agency will have individual objectives to carry out. In addition, the primary objectives

- of each responding agency are established under the unified command concept and focus on these common response priorities, which state:
- preserve the safety of human life;
 - stabilise the situation to prevent the event from worsening;
 - use all necessary containment and removal tactics in a coordinated manner to ensure a timely, effective response that minimises adverse impacts to the environment; and
 - address all three of these priorities concurrently.

For further information on the ICS system in the Western Cape, visit this link:
http://www.westerncape.gov.za/eng/your_gov/200399/pubs/public_info/W

The Incident Commander

The Incident Commander is responsible for the request, use, and release of resources at an incident. Support agency resources are sought through a process that must be outlined in the FPA or municipal or Disaster Management plans. Fire services are a key support along with Working on Fire ground and aircraft services. The level of resources will depend on the incident type. Different systems exist alongside the one from the Western Cape below.

TYPE 5	• The incident can be handled with one or two single resources with up to six personnel. • Command and General Staff positions (other than the Incident Commander) are not activated. • No written Incident Action Plan (IAP) is required. • The incident is contained within the first operational period and often within an hour to a few hours after resources arrive on scene. • Examples include a vehicle fire, an injured person, or a police traffic stop. • Incident Commanders are responsible for ensuring verbal IAP information is communicated to responders, safety is maintained, and incident status is tracked (using status boards, logs, recorded radio communications, incident reports, etc.).
TYPE 4	• Command staff and general staff functions are activated only if needed. • Several resources are required to mitigate the incident. • The incident is usually limited to one operational period in the control phase. • No written Incident Action Plan (IAP) is required but an Incident Organiser will be filled in. • Incident Commanders are responsible for ensuring verbal IAP information is communicated to responders, that safety is maintained and to ensure that the incident status is tracked (using status boards, logs, recorded radio communications, incident reports, etc.).
TYPE 3	• When capabilities exceed initial attack, the appropriate ICS positions should be added to match the complexity of the incident. • Some or all of the Command and General Staff positions may be activated, as well as Division/Group Supervisor and/or Unit Leader level positions. • A Type 3 Incident Management Team (IMT) or incident command organisation manages initial action incidents with a significant number of resources, an extended attack incident until containment/control is achieved, or an expanding incident until transition to a Type 1 or 2 team. • The incident may extend into multiple operational periods. • A written IAP is required for each operational period.

TYPE 2	• This type of incident extends beyond the capabilities for local control and is expected to go into multiple operational periods. • A Type 2 incident may require the response of resources out of area, including provincial and/or national resources, to effectively manage the operations, command, and general staffing. • Most or all of the Command and General Staff positions are filled. • A written IAP is required for each operational period. • Many of the functional units are needed and staffed. • Operations personnel normally do not exceed 200 per operational period and total incident personnel do not exceed 500 (guidelines only).
TYPE 1	• This type of incident is the most complex, requiring national resources to safely and effectively manage and operate. • All Command and General Staff positions are activated. • Operations personnel often exceed 500 per operational period and total personnel will usually exceed 1 000. • Branches need to be established. • Use of resource advisors at the incident base is recommended. • There is a high impact on the local jurisdiction, requiring additional staff for office administrative and support functions.

Data needs to be collected at every incident and a record of how the incident was managed is needed in the event that there is an insurance or liability claim.

 The *Western Cape standardised incident command* form provides a useful template for collating the required information.

The person who arrives first at the fire is the Incident Commander until the fire is put out, or a more experienced person or the Fire Brigade arrives on the scene. Once the fire has been put out and the Fire Brigade and the more experienced persons leave (to be available for other incidents), the landowner on whose land the fire was, will become the IC and monitor the area for a few days for flare-ups.

The Safety Officer

A Command Staff position consisting of a single person who has responsibility for monitoring on-scene safety conditions and developing measures to ensure the safety of all assigned personnel. A Safety Officer may designate one or more assistants from either the same or another assisting agency or jurisdiction.

Managing the media - Liaison Officer

In the case of mobilisation of resources from multiple stakeholders, there will also need to be a person designated to coordinate partners, freeing the IC to manage the fire. The Liaison Officer's role is to serve as the primary point of contact for assisting and coordinating activities between the IC and various agencies and groups.

Managing the media at an incident

How incidents are communicated to the public and media are important. This requires each incident to have a public information point person who can provide information to the concerned public, the media and any other interested parties.

The public information function

The public has a right to know about fire and emergency incidents, what they can do to protect themselves, and what the agencies responsible for managing these events are doing to mitigate the crisis. Response agencies in the event of such major incidents need to be prepared to interact with the media at a moment's notice and to provide accurate, relevant, and potentially lifesaving information. To meet this need, a Public Information Officer (PIO) can help an organisation to convey its message, facilitate better interaction among the media, response agencies, and the public, and help put other response officials at ease when dealing with the media.

Public information is information about an incident or operation. It is generally information that the public wants to know, or may need to know as in the case of an evacuation. The role of the PIO is to provide information about an incident or operation.

The goals of public information include:

- providing effective communication between the PIO and the public via the news media;
- when possible, developing a positive public perception about the agencies involved;
- recognition of the heroes and the personnel who have done the work; and
- dissemination of important fire and life safety messages.

It is the primary mission of the PIO to ensure these goals are achieved. To meet this mission, the PIO should possess some basic communication skills.

- First, the PIO must be an effective verbal communicator. This includes the skills to respond to questions with answers that are concise and succinct.
- Second, the PIO must be able to clarify technical information so that the media and the public easily understand it. The PIO must be able to create and maintain a positive, win-win relationship with the media and various operations personnel.
- Finally, the PIO must be knowledgeable about fire fighting operations. This is critical to gain credibility with the media and the public.

After every wildfire there is a need for a debriefing. This should occur within a week or two of the fire. In the case of multi-agency operations, inputs from all participating agencies are needed to identify lessons learned and to ensure continuous improvement. All participating agencies are responsible for conducting their own operational debriefings before this consolidated debrief.

Finally, after every incident, a fire report must be completed, pursuant to section 6 of the NVFFA.

 **National Fire Report Form** <http://www.nda.agric.za/doaDev/sideMenu/ForestryWeb/webapp/Documents/NationalFIREREPORTFORM.pdf>



The PIO provides the public with information about an incident



A PIO must be knowledgeable about fire fighting operations to gain credibility with the media

16.3 Communication and dispatch

When an unwanted fire is detected that requires any suppression effort, communication is crucial. Whoever detected the fire must first report and relay the status of the fire to their assisting resources and then, if required, request additional resources through the relevant dispatch centre. Operational information such as fuel information (type), topography, burning conditions, and weather must be communicated to firefighters and managers.

Communication about the fire line is as crucial as safety is the major factor.

WoF wildfire dispatch centres are set up to receive requests for assistance and then dispatch the relevant required resources to the affected area as soon as possible, by utilising the set Rules of Engagement. A verbal caller interrogation captures the required information and a resource order is then placed with the dispatcher. Dispatchers relay operational information to the relevant landowner/Incident Commander (IC)/stakeholder to keep them updated on the resources deployed.

After a physical dispatch, the operationally deployed personnel report to the IC. Dispatchers may supply/relay additional supporting information to the IC, e.g. weather forecasts and additional resources upon request. The dispatcher keeps a manual occurrence log (where communications allow it) to note the manual operational timeline.

There is interaction with various agencies, e.g. Disaster Management on various levels. Should an Incident Command Post be established with multiple agencies involved, and working with an Incident Command Team (ICT), the dispatchers will receive their resource orders directly from their Provincial Coordinator who is the operational link between the dispatchers and the ICT and not from the landowner or person who originally requested assistance.

Dispatchers are responsible for communicating the information received during a call for a medical emergency to their Provincial Coordinators in order to activate the Emergency Response Plan.

Operational information is considered confidential and dispatchers do not communicate this outside of their mandate. The relevant media liaison person(s) or the landowner will release fire reporting and status updates with additional information as required by the media.

Dispatchers can expedite any physical dispatch to assist with fire suppression if there are pre-determined Rules of Engagement in place. Being a member of a registered FPA served by a wildfire dispatch centre is an advantage during an unwanted fire emergency.

16.4 Fire suppression

Landowners are legally obliged to fight fires on their land and to stop them from spreading. Neighbours, FPAs, and Fire Brigade Services can all be called on to assist a landowner.

The National Veld and Forest Fire Act (Act 101 of 1998) requires landowners to have the necessary equipment to fight fires. The specific circumstances will determine what is necessary and can be expected. Several FPAs have developed minimum equipment requirements for members. In general, fire beaters and some basic water tanks are a minimum.

Here is a common guide to the type of equipment needed based on the size of the landholding.



Landowners can call on FPAs, the Fire Brigade Services and neighbours to assist in fighting fires on their land

Property size	"Bakkie Sakkie" min 200L or tractor/trailer	Water tanker min 1000L	Water tanker min 2000L	Rake Hoes	Beaters	Knapsacks min 15L	Drip torch	Cellphone	Hand held radio	Mobile radio	First Aid Kit	Firefighters	Crewleaders
Less than 10 ha		0	0	0	1	1	0	0	0	0	0	1	0
11 – 25	1	0	0	1	4	2	0	1	0	0	1	2	1
26 – 100	1	0	0	2	5	3	0	1	0	1	1	4	1
101 – 500	1	1	0	5	10	4	1	1	1	1	1	9	1
501 – 1000	1	1	0	10	15	10	1	1	2	1	2	10/20	1
1001 – 4000	2	0	2	15	20	10	2	1	4	2	2	15/30	3
4001 – 10000	2	2	1	20	40	20	3	1	4	2	5	25/40	3/4
10 000+	3	3	2	20	40	20	3	1	5	2	5	30/50	4/5
Timber processors	1	1	0	4	4	2	0	1	0	0	1	4/10	1/2
Contractors	1	1	0	5	5	5	2	1	2	1	1	10	1
Cane growers <25 ha	1	1	0	1	4	2	0	1	0	0	1	2	1
Cane growers >26 ha	1	0	0	2	5	2	0	1	0	1	1	4	1

Where two numbers are given the test is to ensure access within 30 minutes and to determine the number based on this.

FACT

Did you know?

You are allowed to enter private property of another person if there is a fire and you believe there is risk to lives, property, or the environment. The NVFFA further provides for the destruction of vegetation or crops in the process of fire fighting. This means if the threat was reasonable, you cannot be sued for such destruction.

16.4.1 Do all landowners require fire fighting equipment?

No. Only landowners, on whose land a wildfire could start or burn, require fire fighting equipment. In practice, this includes most landowners.

16.4.2 Initial attack

The first phase of fire fighting, called the initial attack period, is regarded as the most critical phase of the fire suppression efforts. Often the success of the entire fire management programme is reflected in the success or failure of this phase of the fire suppression.

The fire management plan for the area will provide firefighters with instructions on how fires are to be managed. If the plan is reviewed annually, it will specify whether, in some areas, fire should be left to burn as this would benefit the environment, where fires need to be stopped as they pose risks to life, property, and the environment, and what resources are available to suppress the fire.

FAQ: What are critical success factors for initial attack actions?

- quick detection and reporting to the relevant support structures;
- properly trained personnel equipped and supported to address local needs;
- mobilisation of local resources;
- clear incident command structure;
- excellent communication systems;
- excellent cooperation and coordination between fire suppression resources and institutions.

Working on Fire has secured resources to provide aerial support for the first hour of fire fighting in some regions. This is an invaluable resource. Landowners wanting to access this support need to sign a memorandum of understanding for aerial support in which they commit to the costs post the initial hour.

 The Kishugu Working on Fire *MOU for Aerial Request for Assistance form* used at the time of writing this handbook is included by way of example.

FAQ: What right does a third party have to fight a wildfire on the land of another?

Section 18(2) of the NVFFA provides as follows:

“Any person who has reason to believe that a fire on any land may endanger life, property or the environment, may, together with any other person under his or her control, enter that land or land to which the fire can spread in order to prevent that fire from spreading or to extinguish it”.

The Act further makes it an offence to prevent such a person from entering a property or interfering with them whilst they try to suppress the wildfire.

16.4.3 Do landowners have to pay for fire fighting on their land?

Yes. Each landowner is legally obliged to fight fires that start on their property and to stop them from spreading. If you require additional assistance from Working on Fire, your FPA or the Fire Brigade Services, you are obliged to pay for such services.

Some FPAs offer members a discount on these costs, as do some Fire Brigade Services. This is offered as an incentive to encourage landowners to become FPA members.

CASE STUDY

Overberg Fire Brigade Services – First hour of fire fighting free for FPA members

The Greater Overberg FPA has negotiated with the Overberg Fire Brigade Service to incentivise FPA membership by providing the first hour of fire fighting services for free to FPA members. This is a carrot and makes good business sense, as a fire detected and suppressed early on is less likely to get out of control. By providing the first hour free the service is encouraging landowners to call in the experts as quickly as possible, thereby reducing their long-term costs.

16.4.4 Extended fire suppression

If the fire is not put out in the first hour, there is a need for an extended attack. This requires mobilising further resources to fight the fire, which involves two different acts: the Fire Brigade Services Act (Act 99 of 1987) and the Veld and Forest Fire Act (Act 101 of 1998). The fire department takes the lead at this stage and executes their plans in conjunction with landowners. An incident command system should be established on the fire at this stage.

For a detailed description and further guidance, refer to the 2nd edition of the Fire Managers Handbook on Veld and Forest Fires in 2009, edited for South African conditions by Tiaan Pool of NMMU Saasveld.

FACT

Did you know?

Working on Fire employs the largest percentage of women firefighters in the global fire fighting fraternity.

16.5 Safety considerations for firefighters and civilians

Uncontrolled, devastating wildfires destroy homes, businesses, schools, and other structures throughout the world. Protecting communities and saving lives starts with community education and preparation. In addition, one of the best ways to save lives is to have a fire-adapted community, one in which infrastructure and buildings are constructed so as to facilitate subsequent protective actions and in which civilians are able to assist in their own protection and safety.

Civilians should never get involved in direct attack fire fighting unless they received specific training therein, in which case they need to have the minimum personal protective equipment at their disposal. The Incident Commander remains responsible for all activities - also injuries on scene - and it is therefore important to ensure that everyone remains in a safe, manageable situation.

Public safety is very important, but the safety of the firefighter must be given the highest priority. Firefighter safety begins with the provision of the proper safety equipment and training to each individual in fire suppression and prescribed burning operations. Firefighters must also be trained to recognise the characteristics of fire behaviour, such as intensities, spread rates and when a smouldering fire can re-ignite and spread. Crews need to understand how to monitor weather patterns and fires, as well as to estimate potential changes in order to avoid becoming trapped by an unanticipated change in spread or intensity.



Uncontrolled wildfires can destroy homes and other structures

FACT**Did you know?**

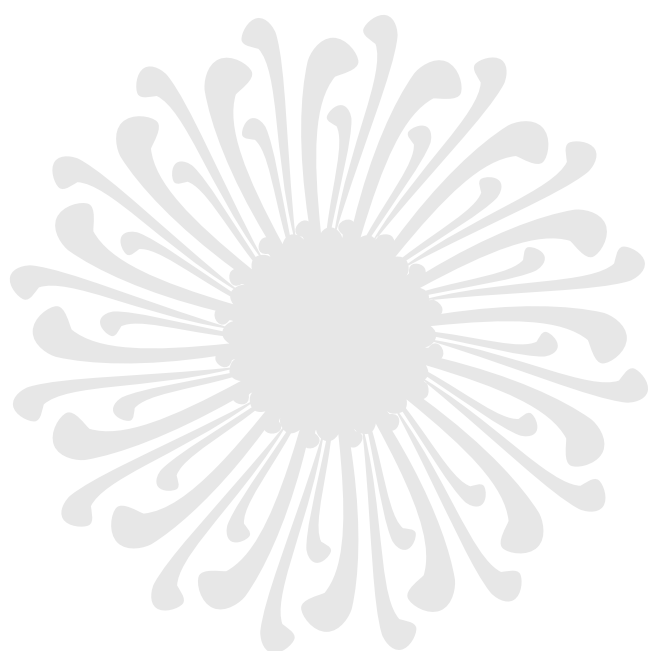
Protective clothing requirements are not spelt out in the NVFFA, which merely states that the landowner must have clothing that is “reasonably required in the circumstance” for personnel to fight fires. Full fire fighting equipment – jackets, helmets, smoke masks, etc. – is expensive and each landowner cannot reasonably be expected to equip a fire brigade.

In terms of the Act, however, all personnel attending to any veld & forest fire should have reasonable and adequate PPE:

- 100% cotton overall/Conti-suit;
- 100% cotton under shirt/T-shirt;
- 100% cotton/wool socks;
- leather gloves – best full forearm length;
- fire-retardant balaclava;
- fire/heat-resistant goggles (preferable);
- leather closed boots with heat resistant soles (not gumboots and be careful not to buy synthetic soles – they tend to melt in contact with direct embers);
- a few sachets of varying sizes of burn shield gauze/gel.

16.6 Managing multiple incidents

For FPAs and Fire Services staff, some of the most difficult and complicated situations occur when multiple fires start simultaneously or when new fires are identified before the initial fire is brought under control. A particular challenge occurs when fires occur across two or more different Fire Management Units and resources need to be prioritised between areas. In such situations, fire management resources are stretched and depleted. Having clear criteria of how prioritisation happens before an incident occurs helps to minimise the conflicts.



CHAPTER SEVENTEEN

REHABILITATION



17 REHABILITATION

After a fire there is a need to rehabilitate the burnt area. Often there is an immediate danger of erosion damage to the environment. There is also often a longer-term danger that the burnt area will be prone to invasion by exotic and invasive species. In commercial areas, there may be a need to remove burnt materials and to re-plant commercial crops or trees. Where communities are reliant on the vegetation for livelihoods and income, there may be a need to find temporary replacements to sustain livelihoods.

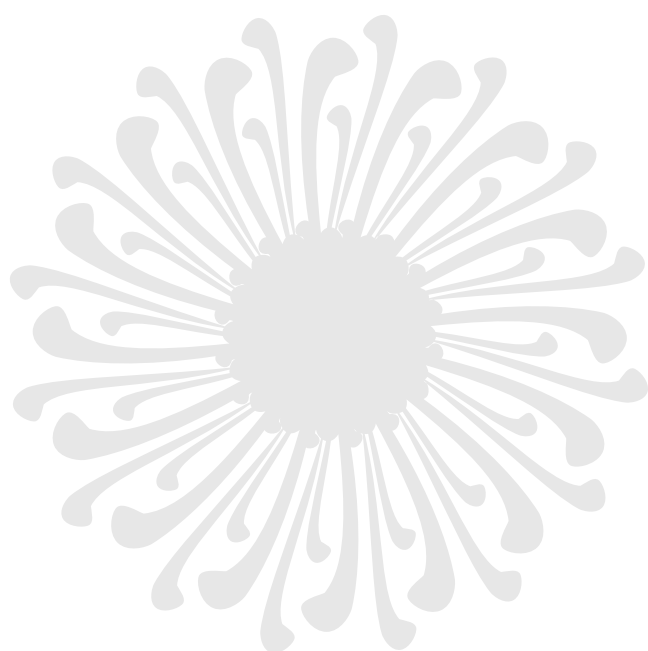


Restoration is required in areas where the ecosystem has been damaged

Rehabilitation is the responsibility of the landowner or manager. However, there are advantages in engaging suppression crews in rehabilitation activities, as it educates them about what damages ecosystems and also might create opportunities for them to minimise restoration needs by better managing how suppression activities are carried out. For example, crews working on firebreaks could be asked to also construct water bars along the break, which reduces the potential for erosion.



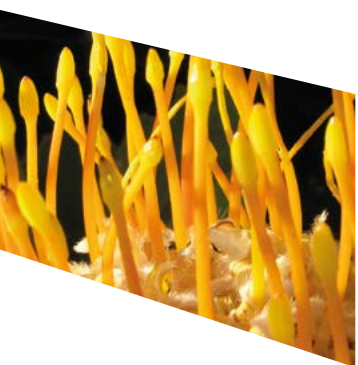
Silt screens help to prevent erosion in an area that is under rehabilitation



CHAPTER EIGHTEEN

MANAGEMENT: COORDINATION, RECORD-KEEPING, AND MONITORING AND EVALUATION



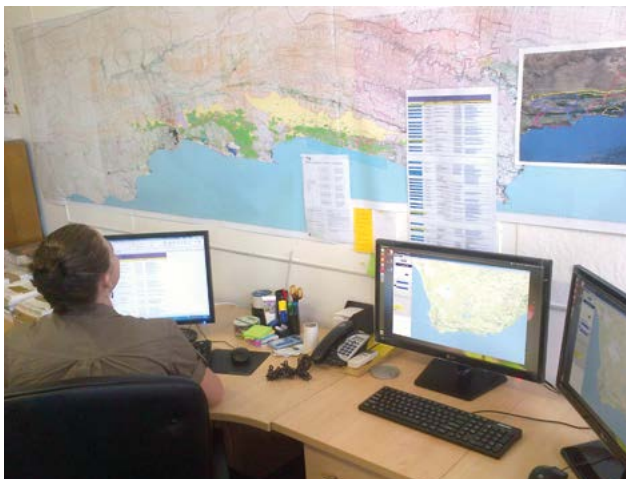


18 MANAGEMENT: COORDINATION, RECORD-KEEPING, AND MONITORING AND EVALUATION

18.1 Coordination

FPA management is about ensuring members feel there is value in the membership and hence relationship management or value-benefit initiatives are key. It is therefore important that the FPA maintain good relationships with members. This can be done in a number of ways:

- Property visits.
- FMU discussions and workshops - pre- and post-fire season. The FPO or FPA Manager should go out and interact with members and/or landowners and not simply rely on the FMU Chair to provide information or feedback.
- A regular newsletter - in and out of fire season.
- Ensuring that weather warnings are sent out throughout the year, not just in fire season.



FPAs are an important hub of information

Further, the FPA should maintain good working relationships with Government, in particular disaster management services, fire services, agriculture, and South African Police Services. As part of maintaining these relationships, FPAs should participate in all Disaster Management Forums and meet regularly with the Fire Services in terms of planning, risk assessments, compliance issues, and general interaction. It should coordinate with organised agriculture and become participants in SAPS Cluster meetings to ensure the SAPS Station Commanders are fully aware of the legalities of the NVFFA, with specific reference to the offences and the respective charges which would need to be brought against transgressors.

18.2 Record-keeping

FPAs are an important hub of information, which requires excellent record-keeping systems to keep it updated. Some of the more important records are detailed below, along with some guidelines.

18.2.1 Membership database

FPAs are membership associations and need to first and foremost service their members. To do this effectively FPAs must take specific steps.

- a membership application form;
- a members' register of contact details, fire-fighting equipment, trained personnel, and any other relevant information;
- training registers;
- a membership fees register; and
- a membership registration list.

Landownership is not static so this information needs to be updated annually. In addition, the FPA should ideally build relationships with real estate agents so they have insight into land ownership changes.

18.2.2 Compliance

Compliance records as stipulated below should be kept by an FPA.

- joint firebreak agreements, where they exist;
- annual review of the Association's resources, i.e. members' equipment and equipment levels;
- annual firebreak inspections;
- membership audits, compliance with rules and regulations, and legal compliance; and
- any compliance letters and spot fines issued.

18.2.3 Training Providers

The FPA must liaise with training service providers, understand course content for veld and forest fire operations, and ensure common standards are achieved. As part of ensuring the capacity and compliance of members, the FPA must keep a register of approved providers and facilitate training opportunities.



FPA's are required to facilitate training opportunities to landowners and personnel

18.2.4 Education

The purpose of record-keeping is to establish an accurate, detailed record of the organisation's public education activities. Types of information that should be kept include:

- subject of presentation;
- description of audience;
- number of people reached by the presentation;
- address/location of presentation;
- names of personnel involved with presentation;
- time and date of presentation;
- customer point of contact; and
- other information needed by organisation.

18.2.5 FPA administration systems

FPA's as public interest institutions need to keep records of meetings, notices, etc. This includes minutes of:

- FPA and FMU meetings; and
- local and district Disaster Management Meetings.

18.2.6 Financial administration

An FPA must ensure good management of its finances and keep all records thereof. To assist with this, the FPA must:

- compile and present its operational budget to members;
- manage expenditure and revenue against the budget; and
- produce quarterly management accounts that are available to members for inspection.

18.3 Reports

18.3.1 National Fire Reports

In the event of a wildfire the National Statistical Fire Report form must be completed and faxed to the nearest office of the Department of Agriculture, Forestry and Fisheries. The form can be downloaded from: <http://www.nda.agric.za/doaDev/sideMenu/ForestryWeb/webapp/Documents/NationalFIREREPORTFORM.pdf>

18.3.2 To whom must an FPA report annually?

For the sake of good governance, it is necessary for the executive of an FPA to report annually to its members.

A registered FPA must submit an annual report to the Minister of DAFF to enable the department to monitor the performance of the FPA, as well as the effectiveness of the National Veld and Forest Fire Act (Act 101 of 1998). Failure to submit a report may result in the FPA being deemed inoperative and ineffective, with the result that its registration is withdrawn in terms of Section 8 of the NVVFA.

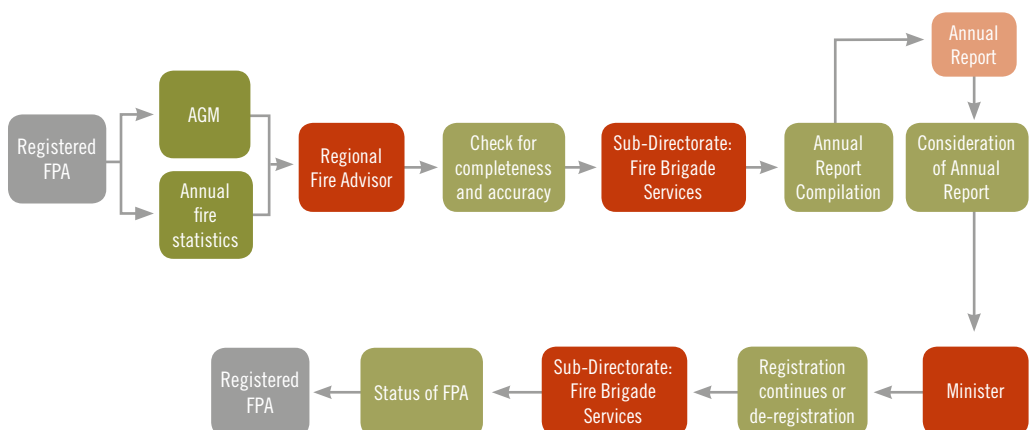
The report must be submitted by 30 June every year.

The report is not confidential and the Minister may make available information about wildfire management contained in the report at any time to any interested party.

The reporting is mandatory in terms of the NVFFA and must be prepared by the FPO.

“6. (1)(e) The Fire Protection Officer must monitor and report to the association and the Minister on compliance with this Act”.

BUSINESS PROCESS: FPA REPORTING



18.3.3 What is the format of the annual FPA report to DAFF?

The following information needs to be covered in the annual report to DAFF.

1. A progress report on the attainment or otherwise of the aims and objectives specified in the business plan, and the implementation of the business plan as a whole.
2. A statistical summary of the causes, extent and consequences of veldfire in the FPA's area.
3. A summary of offences allegedly committed, prosecutions undertaken, and convictions achieved in terms of the Act and any relevant by-laws in the area of the FPA.
4. A report on compliance with the Act as required of the FPO.
5. A record of the FPA's successes and failures in managing wildfires in its area.
6. Suggestions on possible improvements to the Act and its interpretation, regulations, and guidelines.
7. A report on how organs of state and municipalities have or have not complied with the rules of the FPA.
8. A summary of changes in membership, including new members and termination of membership, with reasons given for termination.
9. An account of any major changes to the business plans that have been made to improve the functioning of the FPA.
10. Any other relevant information.



The template for annual FPA reports to DAFF can be downloaded here: http://www.nda.agric.za/doaDev/sideMenu/ForestryWeb/webapp/Documents/FPA_AnnualReporting_Template.pdf

18.4 Assessments

18.4.1 What is the purpose of an assessment?

Increasingly assessments are moving away from a checklist where participants are either right or wrong and achieve a pre-defined standard to a tool that is used in improving management.

The process assesses and rates the robustness of management systems against a hierarchy of principles, criteria and indicators.

1. In the initial phase of development of a management system, the goal of such assessment must be to establish a system that can minimise further damage or losses.
2. In the next phase of development, management efforts should be directed towards putting in place systems that optimise the resource utilisation.
3. Finally, management efforts should then be directed to ensure that the investments are not lost through a range of external factors.

18.4.2 How should landowner-compliance be assessed?

Assessment of fire management systems of individual landowners should be carried out with three outcomes in mind.

1	That the risk of negative impacts, associated with the occurrence and spread of wildfires on a particular property, is minimised.
2	That fire in the natural areas of their property is managed so as to reflect the natural/historical fire regimes of the natural ecosystem.
3	That the achievement of outcomes 1 and 2 is pursued by the majority of land users across the shared agricultural or natural system, and that the landowner participates in specific programmes and initiatives, including a fire protection association, aimed at achieving Integrated Fire Management and sustainable land management dynamics for the agricultural and natural ecosystem as a whole. The risk of negative impacts, associated with the occurrence and spread of wildfires on a particular property, is minimised.

Farming operations that are upholding the first outcome understand the vulnerability of agricultural production, agricultural systems, and ecosystems to wildfires, and have specific strategies and management systems, and take specific actions, aimed at minimising the threat of wildfires and associated damage. Good practices that support the fulfilment of this outcome are listed below.

- Landowners prepare and maintains firebreaks on the properties and, where appropriate and by agreement with neighbours, realign the firebreaks so that they are not located on the property boundaries but in locations where they will prove most effective in wildfire suppression.
- Farm management has adequate fire-fighting equipment at its disposal to suppress a wildfire when it starts and to contain its spread.
- Farm management has adequate fire fighting personnel at its disposal, whether employed by the farm or elsewhere, to contain the spread of a wildfire on the farm.
- The landowner is a member the local FPA.

All, other than membership of an FPA, are mandatory. These are the minimum requirements that need to be met.

Fire in the natural areas of the property must be managed so as to reflect the natural/historical fire regimes of the natural ecosystem.

The management or use of fire is necessary to promote both natural systems and the regeneration of biodiversity, while reducing the fuel load and thus the associated fire hazard. Wildfires pose significant economic risks as well as impact on natural resources, biodiversity, and ecosystem functioning. Land management practices should illustrate an understanding of the key role that fire plays in natural ecosystems, and there should be specific strategies and management systems in place and specific actions taken aimed at managing fire in the natural areas in a way that mimics the historical fire regimes that characterise these systems. Good practices that reflect this are listed below.

- The landowner meets the requirements of the first outcome relating to the management of wildfires.
- The landowner is aware of the natural fire characteristics and requirements of their specific biome/ecological region and natural system.
- The landowner secures the input of relevant experts, neighbours, and local natural resource managers specifically to determine the appropriate fire management regimes required for all natural areas, including water courses.
- There is a fire management plan for the farm in place that meets legal, safety, and practical requirements.



- The fire management plan specifically incorporates the appropriate use of fire within the areas of natural vegetation on the farm and provides for prescribed burning.
- Where there is a risk of veldfire starting within the farm boundary and spreading beyond it, management prepares and maintains firebreaks on the farm and the adjoining land and, where appropriate and by agreement with neighbours, realigns the firebreaks so that they are located not on the farm boundaries but in locations where they will prove most effective in fire suppression.
- The landowner is a member of the local FPA.

The achievement of outcomes 1 and 2 above is pursued by the majority of land users across the shared agricultural or natural system, and the landowner participates in specific programmes and initiatives, including an FPA, aimed at achieving Integrated Fire Management and sustainable land management dynamics for the agricultural and natural ecosystem as a whole.

The natural systems of different properties are highly interconnected and the boundaries of the natural systems often extend well beyond the legal boundaries of individual properties. The result is that the actions of individual landowners in the natural system, whether they have positive or negative ecological and economic consequences, impact other landowners via this highly interconnected system. The ability of individual landowners to achieve optimal management that is no longer highly susceptible to the impacts of wildfire ultimately depends upon the actions of the other landowners in the system. If achieving IFM is the objective at the level of the individual property, then all the landowners in the system need to pursue this same objective, and collaborate and coordinate their actions to achieve it.

Landowners that achieve this outcome understand this larger system and the interconnections and dependencies within it, particularly as they relate to managing wildfires. They have specific strategies and management systems and take specific actions aimed at enrolling other landowners to participate in FPAs to engage in proactive planning, to undertake risk minimisation programmes, and to participate in other collaborative system-wide programs aimed at achieving IFM across the system. Good practices that reflect this are geared towards encouraging and achieving a high level of information sharing and collaboration with the other landowners across the shared system. Practices that should be included are listed below.

- The landowner meets the requirements of the first two objectives.
- The “boundary” of the shared system is defined and the other key landowners are identified.
- The key challenges within the system related to the impacts of wildfires are identified.
- External expertise, such as from local academic institutions, is sought to support greater understanding of system-wide issues and challenges related to the impacts of wildfires, as well as the management responses based on IFM.
- The landowner actively seeks out existing initiatives and programmes that specifically support understanding of the wildfire dynamics of farms and the associated impacts.
- The farm is an active member of the FPA, regional growers’ associations, study groups or other forums that support engagement and collaboration on shared issues and challenges related to wildfires as well as securing landscape-level support for fire management initiatives.

 An example of an *FPA “audit” form and progress checklist* and a template *FPA Member Assessment form* is attached.

18.4.3 Is the FPA functional?

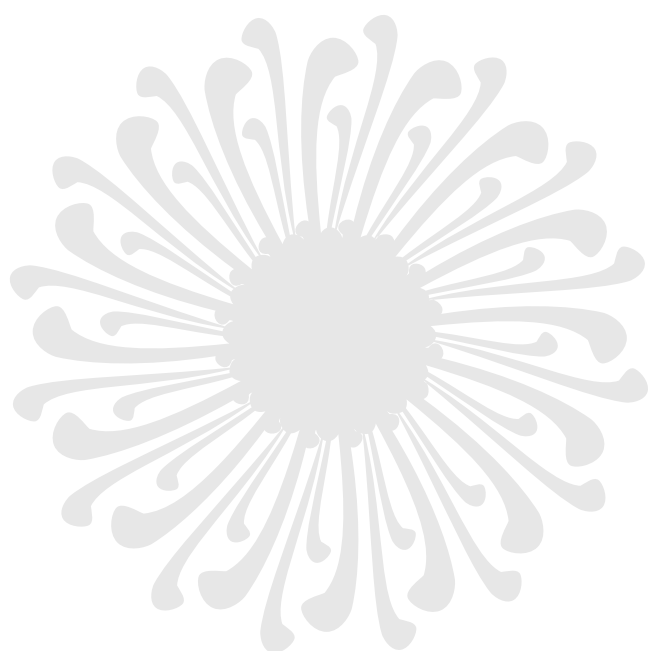
To assess the effectiveness of individual landowners, it is important to ensure that FPAs are able to meet a set of legal and management objectives. Again, this is a repeated process that uses legal requirements as its starting point and then provides a management tool that can assist with optimising the scope and influence of the FPA.

- 1) The FPA has developed structures and systems to prevent and fight wildfires.
 - a) There is effective communication and coordination among members of the FPA.
 - b) There is sound planning and coordination with fire brigade services, disaster management, and other services.

-
- c) The wildfire management strategy is in place and has broad stakeholder support.
 - d) The wildfire management strategy in the business plan includes a proper risk and vulnerability assessment.
 - e) The business plan is effectively implemented and owners, as defined in the Act, have implemented their IFM plans.
 - f) Owners comply with the FPA's rules and the minimum requirements of the Act.
 - g) Fire protection and prevention measures, including firebreaks, are in place.
- 2) The FPA, either directly or through its members, is ready with equipment or trained employees.
- a) The FPO is registered and has assumed powers under the Act.
 - b) The early warning system (National Fire Danger Rating System) is operating, communicated and aligned with rules and practices.
- 3) The FPA is organised to fight wildfires.
- a) Owners know and understand their roles and responsibilities.
 - b) Municipal fire services and disaster management know their roles, and agreed wildfire contingency plans are in place.
 - c) Mutual-assistance agreements are in place with any neighbouring FPAs.
 - d) The relationship with the Working on Fire programme is clearly defined.
 - e) Support is available from an umbrella FPA (e.g. aerial support).
 - f) Joint operating centres (JOCs) work to coordinate resources.
 - g) The JOC is under the coordination and control of a single person, the FPO.
 - h) All organisations involved in fire fighting are included in planning and decision-making structures, and their representatives are empowered to take decisions.
 - i) All necessary communications and resources are available and properly coordinated.
- 4) The FPA is able to respond effectively to wildfires.
- a) The relevant persons are trained in standard wildfire incident command – fire bosses know what to do and how to do it.
 - b) Escalation procedures are in place and it is clear how to pass the command upwards from owner to FPO to CFO to Province.
 - c) Standard operating procedures are in place, known and applied.
 - d) Safety measures for personnel are of the highest standard.
 - e) Resource tracking systems are in place, i.e. the IC/FPA knows at any time where resources are being deployed.
 - f) Emergency services can take care of the knock-on effects of wildfires (traffic control, evacuations, etc.).

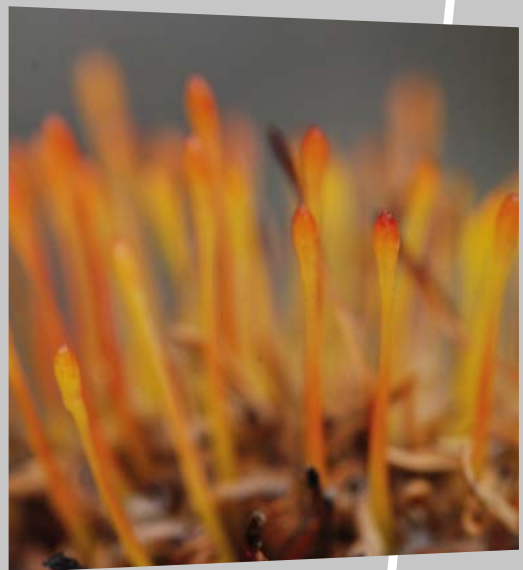
The detailed assessment format for individual FPAs that has been developed by the national FPA coordinating body is attached as a tool.





CHAPTER NINETEEN

MAPPING AND GIS SYSTEMS





19 MAPPING AND GIS SYSTEMS

Management cannot manage what it does not know and cannot measure. An important part of IFM is the identification of fire risks, including the likelihood of a fire and the consequences should one occur. Sometimes this involves competing demands. For example, while an event like a fire may be unlikely to happen, its consequences can be major or even catastrophic. Consequently, plans are needed to minimise risk. When planning fire management, it is important to think about economic, environmental, and social risks (risks to people). The impact of both fire prevention activities and the fire itself can affect safety, the environment, and the long-term sustainability of a property.

For an FPA to be in a position to fully understand its area of operation, it is of vital importance that the FPA undertakes a detailed mapping exercise, which reflects the areas listed below.

- The boundary of the FPA area of operation and how the boundaries align with neighbouring FPAs. (It is important that boundaries do not overlap and that there are no “open areas” between FPAs). This should also include any FMU boundaries.
- Landowner or member cadastral boundaries. These can be obtained from the Local Municipality or District Municipal GIS departments, the Deeds Office, or the Department of Agriculture.
- An overview of land including:
 - vegetation type;
 - land use;
 - urban-rural fringe (informal settlements, other high risk nodes);
 - high risk nodes – properties, industrial, storage facilities, depots, etc.; and
 - other strategic or vulnerable infrastructure.

This is the bare minimum needed.

With geographic information systems available, most FPAs have supplemented this general information with other relevant details.

- Member land and member information:
 - contact details;
 - GPS coordinates;
 - equipment on farm;
 - proximity of fire services resources including District Municipality fire services. WoF and any private sector capacity including:
 - identify where WoF teams are located – proximity to WoF team resource, contact details of base manager, crew leader, number of crew available, type of transport and equipment available, etc.;
 - identify fire stations – proximity to fire stations, contact details, type of equipment;
 - identify airstrips in the region for fixed wing aviation support at fires – length of runway, water point capacity, contact details to activate airstrips; and
 - identify water points – more specifically for ground resources to replenish mobile water supplies and including key dams and reservoirs that are identified for aerial helicopter support;
 - identification of key assets and key fire safety risks, including those from adjacent properties and features including:
 - assess whether the risks identified are relevant and/or significant to the property by considering the likelihood and consequences of these risks happening; and
 - consider impacts on adjacent properties and features.

This is the second level of detail. A final layer includes a more detailed assessment per FPA member property, which forms layers to the core mapping/GIS system and are listed below.

- the risk assessment will identify fuel loads (and categorise the fuel load blue to red, on a similar basis to the FDI/DM Advisory);
- strategic firebreaks and where such should be placed;
- natural buffer zones;

- roads, in terms of access and control points;
- Eskom Transmission Lines – 132-765 Kva lines;
- other strategic or vulnerable infrastructure; and
- public areas such as camping, lookout points, etc.

Mapping and an interactive GIS system are vital tools for the overall management of the FPA as well as a tool for the ICS. Further information layers can be added to mapping that will assist in managing the FPA area and in respect of fire suppression activities (ICS). For example, if there is a comprehensive GIS, the FPA can allow member and fire services vehicle tracking systems to be linked to mapping, which assists with the management of vehicles at a fire or even where vehicles should be located on days of readiness. Similarly, aircraft tracking can be done. Finally, a well-managed mapping/GIS system can assist the FPA in identifying non-compliant landowners - the nature of non-compliance relative to the risk assessment.

After a fire there is also a need for mapping so that rehabilitation work can be monitored, but also so that any reallocation of resources can be made based on actual risks and not historic risks.

There are a number of mapping and GIS systems available on the market, varying in cost from open source (free) to expensive (which in turn often requires training and a dedicated staff member), some of which are listed below.

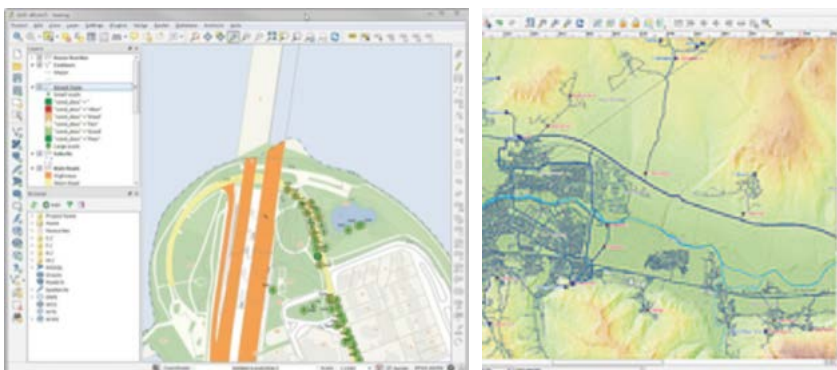
 **GOOGLE EARTH** is one of the more common. It is easy to use and the more one uses Google Earth, the more updated the imagery:

- Google Earth can interact with a number of other applications, which makes electronic display of such information easy; and
- printing of maps is not really possible, unless the FPA wants photo quality mapping or imagery.

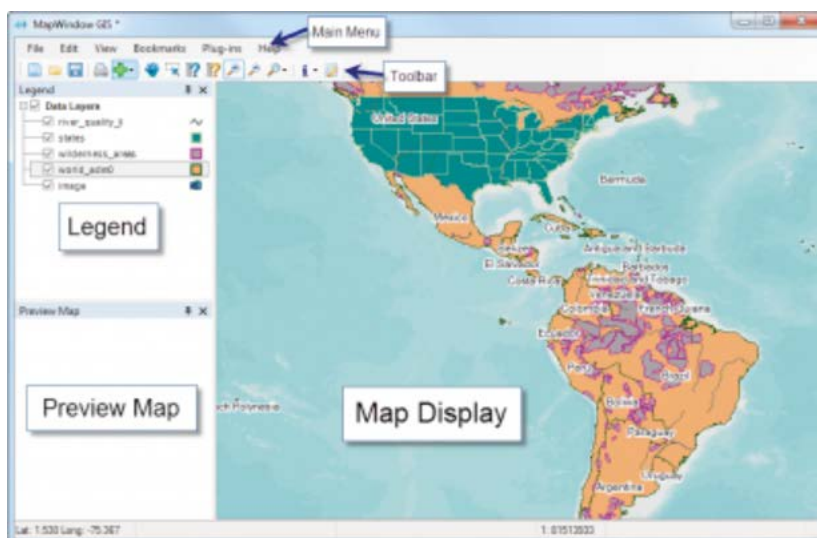


 **QGIS** – free open source GIS mapping:

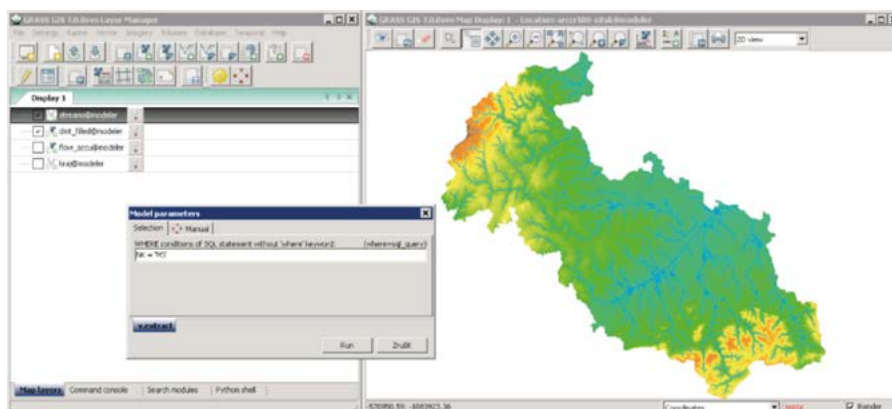
- create, edit, visualise, analyse, and publish geospatial information; and
- for Windows, Mac, Linux, BSD, and Android.

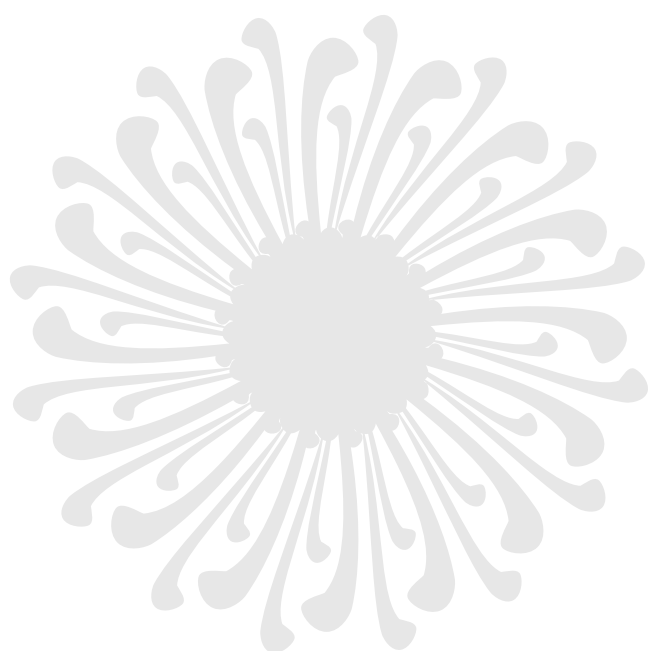


MAPWINDOW GIS Open Source



GRASS GIS Open Source





CHAPTER TWENTY

TRAINING: BUILDING IFM CAPACITY





20 TRAINING: BUILDING IFM CAPACITY

Training is an essential part of both fire preparedness and safety. Landowners need to be trained in the basics of fire fighting, and personnel involved in fighting fires need to be properly trained. Such training varies from region to region but includes a number of basic elements outlined in this section.

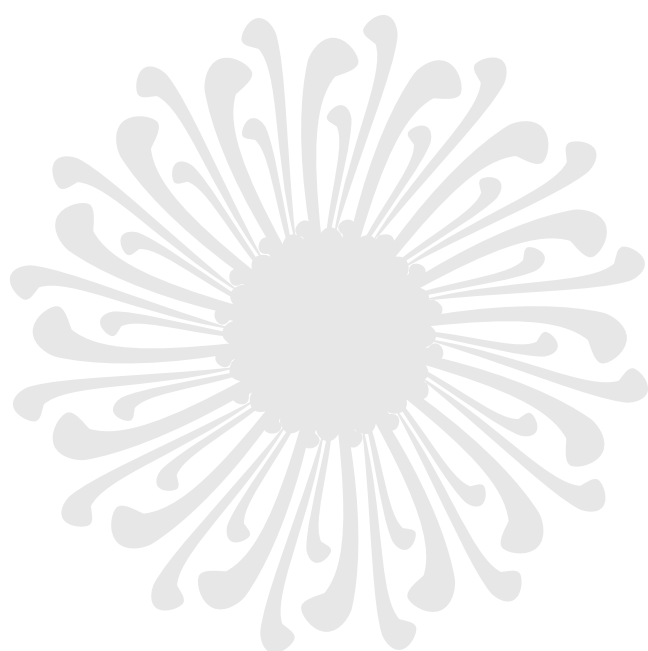
Basic fire fighting training is needed, which includes information on the National Veld and Forest Fire Act (Act 101 of 1998), the fire danger rating, understanding fires and wildfire behaviour, safety at fires, handling of equipment and tools, and communication.

More advanced and specialised training is needed in a range of areas including:

- Wildfire Behaviour Principles (fuel, weather, topography, fire behaviour, fire safety);
- Integrated Fire Management Principles (prevention, protection, suppression);
- Risk Analyses (risk determination and offset of risks);
- Community Risk Reduction/Fire and Life Safety Educator (level I);
- Planned/Prescribed burning;
- Radio Communication;
- FDI System – Planning for high fire danger;
- Strategic Fire Management Planning;
- Urban Interface Management;
- Infield Simulation Sessions;
- Wildfire Suppression: Basic;
- Fire Ecology and Conservation;
- Basic ICS; and
- Advanced ICS (managing disaster fires).



A basic fire fighting training session for farm workers



CHAPTER **TWENTY ONE**

INCENTIVES AND ENFORCEMENT





21 INCENTIVES AND ENFORCEMENT

21.1 Incentives

21.1.1 Incentives offered by FPAs

A range of incentives is being offered by fire protection associations around the country to assist landowners to discharge their legal obligations. These provide incentives to become part of the FPA. Some of the services are listed below.

1. Assistance to discharge a duty to maintain firebreaks in terms of section 12(1):
 - a. assistance with firebreak management – planning, cutting, and maintaining firebreaks;
 - b. assistance with securing realignment in terms of section 12(7); and
 - c. assistance with securing exemptions in terms of section 15(1).
2. Assistance to discharge a duty to have fire fighting equipment, protective clothing, and trained personnel (section 17(1)(a)) through:
 - a. a contracted service provided through the FPA managing Working on Fire teams; and
 - b. mutual-aid agreements between landowners brokered by the FPA.
3. Assistance with services to discharge the duty to have responsible persons present on or near the land who, in the event of fire, will extinguish the fire or assist in doing so (section 17(1)(b)(i)).
4. Assistance with the duty to take all reasonable steps to alert the owners of adjoining land and the relevant FPA of a fire (section 17(1)(b)(ii)).
5. Assistance with coordinating the fire suppression efforts of other FPA members.
6. Membership enables landowners to avoid the Presumption of Negligence (refer to chapter 9, section 34 of NVFFA).

21.1.2 Rates rebate

A range of rebates exists within local government.

- Rebates on rates and services for sectors such as the agricultural sector. This incentive can only be implemented in metropolitan areas as in the districts 'B' municipalities charge rates. 'C', or district municipalities, however, do not charge.
- Waiver of charges for burning permits in some areas.
- Rates-based incentives are only possible in the metropolitan regions where 'A' municipalities are responsible for rates and for wildfire management. Outside of the metros, the 'B' municipalities are responsible for rates and the 'C' municipalities for wildfire management. As a result, any landowner rates or service charge rebates are unlikely to be agreed.

Most 'C' municipalities are under pressure to increase revenue and Chief Fire Officers have all been asked to recover fire fighting costs from landowners and their insurers. Offering recovery incentives to people who are members of FPAs is a quick win and under the control of Districts. The Overberg is already doing this.

21.1.3 Fire fighting cost rebates

Within the Overberg District, the District Municipality is already offering members of FPAs the additional incentive of an hour of free fire fighting support in fire suppression on their properties. Similar incentives could be offered in other areas to encourage wall-to-wall membership.

21.1.4 Insurance rebates

Insurance rebates are already offered to members of FPAs. For example, one insurer, Mutual and Federal, already offers a R500 incentive to agricultural clients. This rebate follows solely by virtue of a landowner's

membership of an FPA, with no regard to whether the landowners have complied with their obligations in terms of the Act or not. Other insurers such as Santam offer public insurance rebates, also on the basis of membership.

Ideally these rebates should be linked to compliance as well or further rebates should be offered for compliance. This is costly, however, and there is limited appetite to complicate the system. As FPAs become more robust, and it is increasingly possible for the FPA to monitor compliance by its individual members, it may be feasible to look to linking these benefits to annual compliance certification from the FPA.

21.2 Enforcement

21.2.1 What is the role of the FPA in enforcement?

While the FPA must not become known as a “policeman” it is important that it is firm in its approach, and fair to all members. The FPA must also lead prosecutions via the appropriate bodies (SPAS, FPA, and Insurance) for repeat offenders. This is particularly important where the FPA is involved in compliance monitoring on behalf of the FPO or as the FPO.



21.2.2 What are the offences created by the National Veld and Forest Fire Act (Act 101 of 1998)?

The NVFFA provides for a number of offences.

1. General duties to prevent fires starting:
 - a. lighting, using or maintaining a fire in the open air when a warning has been issued in terms of the Fire Danger Rating (section 25(1));
 - b. leaving a fire in the open air unattended, which he or she lit, used, or maintained before that fire is extinguished (section 25(2));
 - c. lighting, using, or maintaining a fire which spreads and causes injury or damage;
 - d. throwing, putting down, or dropping a burning match or other burning material or any material capable of spontaneous combustion or self-ignition and, by doing so, making a fire which spreads and causes injury or damage;
 - e. lighting, using or maintaining a fire in a road reserve except if it is in a designated fireplace or is for the purpose of burning a firebreak; and
 - f. smoking where smoking is by notice prohibited.
2. Duties on landowners in relation to Integrated Fire Management:
 - a. failing to prepare a firebreak when obliged to do so by the Act;
 - b. failing to give notice of intention to burn a firebreak as required by the Act;
 - c. burning a firebreak when a fire protection association has objected to it being burnt;
 - d. failing to inform adjoining owners should a firebreak or prescribed burn not take place as planned;
 - e. failing to meet the standards of readiness for fire fighting required by the Act;
 - f. failing to notify the FPO and adjoining landowners of a threatening wildfire;
 - g. refusing to assist an FPO or other enforcement officer as required by the Act; or
 - h. hindering or obstructing any person or enforcement officer wanting to enter land to fight a wildfire (section 25(4)).

3. General duty on landowners to prevent the spread of wildfires:
 - a. any owner, occupier or person in control of land on which a fire occurs failing to take reasonable steps to extinguish the fire or to confine it to that land or to prevent it from causing damage to property on adjoining land (section 25(5)).
4. Interference with enforcement:
 - a. preventing a FPO or other enforcement officer from exercising the powers of entering, searching, seizing or arresting in terms of the Act or in the performance of his or her duties in relation thereto (section 25(6)).

21.2.3 What are the penalties for contravention of the National Veld and Forest Fire Act?

The NVFFA makes provisions for fines, imprisonment, and community service for those committing offences in terms of that Act.

21.2.4 Who has the power to enforce the National Veld and Forest Fire Act?

The provisions of the NVFFA can be enforced by the following persons (section 26):

1. if registered by the Department, an FPO;
2. a forest officer;
3. a police officer; and
4. an officer appointed in terms of section 5 or 6 of the Fire Brigade Services Act, 1987.

21.2.5 What are the legal powers of the FPO?

A fire protection officer has the following legal powers in terms of the NVFFA:

1. power to enter and search (s27);
2. power to seize (s28);
3. power to arrest (s29); and
4. power to arrest (s30).

21.2.6 What is the procedure for dealing with non-compliance?

Ultimately it is desirable to have all landowners willingly collaborating around IFM initiatives. The failure of landowners to comply with their legal obligations often are borne out of either ignorance of the obligations or ignorance of the consequences of their failure to comply. The problems of compliance can be dealt with in most cases through the annual assessment of individual landowners.

Where problems do emerge with non-compliance, it is recommended that certain procedures are adopted.

1. Notify the landowner of his or her legal obligations in terms of the applicable legislation as well as the consequences for non-compliance. These consequences could include the following:
 - a. criminal prosecution for contravention of the legislation;
 - b. possible civil claims, particularly as the landowner would no longer be able to fall back on claims of ignorance;
 - c. possible increased financial exposure, arising from repudiation of claims or denial of cover by insurers of errant landowners; and
 - d. if the legislation allows it, the responsible authority itself undertaking the activity and recovering the costs from the landowner.



An example of a *Non-Compliance Notice* is attached.

There is no reason why the notification cannot be sent by one landowner to another. Should the landowner fail to comply with the notice or a notice be deemed inappropriate, the FPO or enforcement officer can consider the issuing of a spot fine.

 The *Determination for the Admission of Guilt* Fines according to the National Veld and Forest Fire Act (Act 101 of 1998) is attached.

Should the fine not elicit the desired response, criminal proceedings should be considered.

21.2.7 What other sanctions does an FPA have at its disposal?

All landowners who are members of an FPA are bound by the rules and regulations of that FPA. The rules make provision for certain minimum levels of compliance with the provisions of the NVVFA and other related legislation. Landowners failing to abide by these rules can be faced with suspension or termination of their membership and the various benefits that flow from such membership.

One of the immediate consequences would be that the presumption of innocence would no longer apply and the errant landowner may also find insurance cover being suspended. The rules of the FPA must make clear provision for such suspension or termination.



CHAPTER TWENTY TWO

GLOSSARY







22 GLOSSARY

TERM	ABBREVIATION	DESCRIPTION
Advanced Fire Information Systems	AFIS	Satellite fire-detection system that records incidences of fire as well as burn scar information. www.afis.co.za . The app can be downloaded for smart phones and tablets.
Aerial ember		An ember carried aloft by wind ahead of a fire and able to cause spotting to occur.
Air mass		A meteorological term referring to an extensive body of air within which the conditions of temperature and moisture, in a horizontal plane, are essentially uniform.
Anchor point		An advantageous position or location, usually a barrier to fire spreads, from which to start constructing fire control lines or for anchoring counter of backfires. They are used to minimise the chance of being outflanked by the fire while constructing the control line.
Arson fire		An uncontrolled fire wilfully ignited by someone without consent of the owner or his/her agent with the intention that it burn, or spread to vegetation or property. According to South African criminal law, arson consists in unlawfully setting an immovable structure on fire with intent to cause injury. The word arson should not be used unless structures are involved. Rather use the term “malicious damage to property” to cover veldfires.
Assets		Anything valued by people, which includes houses, crops, forests, and, in many cases, the environment.
Atmospheric stability		The degree to which the atmosphere resists turbulence and vertical motion.
Attack a fire		Limit the spread of fire by any appropriate means.
Available fuel		The portion of the total fuel that would actually burn under various environmental conditions.
Back burn		A method of indirect fire fighting whereby fire is used to widen the firebreaks and to remove fuel load ahead of approaching fire.

TERM	ABBREVIATION	DESCRIPTION																																										
Bakkie sakkie		Mobile fire fighting unit. Usually a tank and pump combination temporarily fitted to a pick-up truck.																																										
Beaufort scale		A numeric scale used to estimate the force of the wind when no instruments are available: <table> <tr> <th>Wind speed (km/h)</th><th>Designation</th><th>Description</th></tr> <tr> <td>< 2</td><td>calm</td><td>smoke rises vertically, trees do not move</td></tr> <tr> <td>2-5</td><td>light air</td><td>smoke drift indicates wind direction</td></tr> <tr> <td>6-11</td><td>light breeze</td><td>weather vane moves, leaves rustle</td></tr> <tr> <td>12-19</td><td>gentle breeze</td><td>leaves and twigs in constant motion</td></tr> <tr> <td>20-29</td><td>moderate breeze</td><td>dust and loose paper are raised, small branches move</td></tr> <tr> <td>30-38</td><td>fresh breeze</td><td>small trees sway</td></tr> <tr> <td>39-50</td><td>strong breeze</td><td>large branches move, wind whistles wires</td></tr> <tr> <td>51-61</td><td>moderate gale</td><td>whole trees move, walking is affected</td></tr> <tr> <td>62-74</td><td>fresh gale</td><td>twigs break off trees, walking is difficult</td></tr> <tr> <td>75-86</td><td>strong gale</td><td>slight structural damage occurs, branches break</td></tr> <tr> <td>87-100</td><td>whole gale</td><td>trees uprooted, considerable structural damage</td></tr> <tr> <td>101-118</td><td>storm</td><td>widespread damage</td></tr> <tr> <td>119+</td><td>hurricane</td><td>severe and extensive damage</td></tr> </table>	Wind speed (km/h)	Designation	Description	< 2	calm	smoke rises vertically, trees do not move	2-5	light air	smoke drift indicates wind direction	6-11	light breeze	weather vane moves, leaves rustle	12-19	gentle breeze	leaves and twigs in constant motion	20-29	moderate breeze	dust and loose paper are raised, small branches move	30-38	fresh breeze	small trees sway	39-50	strong breeze	large branches move, wind whistles wires	51-61	moderate gale	whole trees move, walking is affected	62-74	fresh gale	twigs break off trees, walking is difficult	75-86	strong gale	slight structural damage occurs, branches break	87-100	whole gale	trees uprooted, considerable structural damage	101-118	storm	widespread damage	119+	hurricane	severe and extensive damage
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Berg wind		The flow of air from a high-pressure system to low-pressure system. The air warms as it descends at 1.5° C per 300m (1000ft). It also speeds up and dries out. In the Eastern Cape and KwaZulu-Natal, the berg winds blow from the northwest. These are the most dangerous fire-weather winds as they are very strong and dry. They normally precede a frontal system. In the Western Cape, strong southerly winds, combined with high temperatures during the dry summer months, tend to drive wildfires.																																										
Block burn		A prescribed burn in a pre-determined and specified land area.																																										
Blow-up		A sudden increase in fire line intensity or rate of spread of a fire, sufficient to preclude direct control or to upset existing suppression plans. Often accompanied by violent convection and may have other characteristics of a firestorm.																																										
Brandbeskerm-vereeniging	BBV	The Afrikaans term for a Fire Protection Association.																																										
Brush		A collective term that refers to stands of vegetation dominated by shrubby, woody plants, or low-growing trees, usually of a type undesirable for livestock or timber management.																																										

TERM	ABBREVIATION	DESCRIPTION
Brush fire		A fire burning in vegetation that is predominantly shrubs, brush and scrub growth.
Burn Permit		A permit that is required before undertaking any planned open burning/fire namely, the burning of a bonfire, vegetation debris or other fire in an outdoor location where fuel burned is not contained in an incinerator or outdoor fireplace. Burn permits are obtained from the District Municipality or the Local Authority.
Burning ban		A declared ban on open-air burning within a specified area, usually due to sustained high fire danger. The declaration is usually by a by-law passed by the local authority or a regulation enforced by the Fire Protection Officer of an FPA.
Burn scar		The area burnt by a fire.
Burning conditions		The state of the combined factors of the environment that affect fire behaviour in a specified fuel type.
Burning program		A program of prescribed burns scheduled for a designated area over a nominated time, normally looking ahead over one fire season (for the coming spring to the following autumn), but can also look ahead five years or more.
Burning rotation		The period between re-burning of a prescribed area for management purposes.
Burning unit		A specified land area for which prescribed burning is planned (often referred to as a "block burn").
Burnout		A method of indirect fire fighting whereby fire is used to widen firebreaks on the fire flanks.
Canopy		The crowns of the tallest trees in a forest – the overstorey cover. Can be the tallest plants creating a cover in any vegetation type, i.e. fynbos canopy.
Catastrophic fire		A fire that causes unrecoverable damage to property, loss of life or limb. In plantations, the area is more than 100 hectares.
Chief Fire Officer	CFO	The person appointed in terms of section 5 of the Fire Brigade Services Act (Act No. 99 of 1987), to be in charge of a fire brigade service.
Climate		The atmospheric conditions of a place over an extended period of time.
Closure		Legal restriction, but not necessarily the elimination, of specified activities such as smoking, camping or entry that might cause fires in a given area.
Cold front		A cold front is the delineation between cold polar air moving towards the equator and undercutting warm tropical air moving towards the pole. The temperature differences across a cold front can be extreme and are associated with strong winds. The warm tropical air is forced to rise and become unstable with the development of large cumuliform clouds. Severe weather such as thunderstorms, squall lines and severe turbulence may accompany these cold fronts.

TERM	ABBREVIATION	DESCRIPTION
Combustible		Any flammable material that, in the form in which it is used and under the conditions anticipated, will ignite and burn.
Combustion		Rapid oxidation of fuels producing heat, and often light.
Comparative Risk Assessment	CRA	A set of procedures, i.e. a protocol, for the simultaneous assessment and ranking of diverse risks. The term distinguishes this protocol from the procedures employed for univalent risk assessment, where risks arising from the exposure of, usually humans, to, for example, a toxic compound, are assessed through a dose-response relationship, i.e. an “objective characterisation of the distribution of possible outcomes”.
Condition of vegetation		The stage of growth or degree of flammability of vegetation that forms part of a fuel complex.
Conflagration		A raging, destructive fire. Often used to describe a fire burning under extreme fire weather. The term is also used when an uncontrolled veldfire burns into an urban interface zone, destroying many structures.
Consequence		An adverse effect to health, property, the environment or other things of value.
Continuous fuels		Combustible material with no natural or man-made break to stop the fire spread through it.
Controlled fire		A fire that is subject to a line of control around a fire, any spot fire from it and any interior island to be saved, effectively preventing any unplanned spread.
Control Room		24-hour call centre receiving and dispatching all emergency calls, which, in this context, has a focus on wildfires.
Controlled burning		Often incorrectly used to refer to a “prescribed burn”. See “Controlled fire”.
Convection		As applied in: Meteorology – atmospheric motions that are predominantly vertical, resulting in vertical transport and mixing of atmospheric properties; distinguished from advection; or Thermodynamics – convection, along with conduction and radiation, is a principal means of energy transfer.
Convection column		The rising column of smoke, ash, burning embers, and other particle matter generated by a fire.
Convective activity		General term for manifestations of convection in the atmosphere, alluding particularly to the development of convective clouds and resulting weather phenomena such as showers, thunderstorms, squalls, hail and tornadoes.
Crown fire		A fire that burns in and advances through the top leaves of the canopy of the trees or vegetation.
Dead fuel		Combustible material made of dead matter and with moisture content that is entirely governed by the atmosphere and weather conditions - either wetting or drying it out. Also called ‘dead and down’ fuels.

TERM	ABBREVIATION	DESCRIPTION
Debris burning fire		A fire spreading from any fire originally ignited to clear land or burn rubbish, garbage, crop stubble or meadows (excluding incendiary fires).
Defensible space		An area, typically a width of 10m or more, between a property and an approaching wildfire, where the combustible material has been removed or modified.
Department of Agriculture, Forestry and Fisheries	DAFF	The government department within South Africa currently responsible for the administration of the National Veld and Forest Fire Act.
Direct attack		A method of fire attack where wet or dry fire fighting techniques are used, in suppression action, right on the edge of the fire, which then becomes the fire line. It generally involves firefighters moving directly onto the fire line to extinguish the flames. This generally happens when the flames are lower than 1.2m.
Disaster risk		The chance that there will be a harmful impact of some kind, due to the interaction between natural or other hazards and conditions of vulnerability.
Dry hydrant		An arrangement of pipe, permanently connected to a water source other than a piped, pressurised, water supply system, that provides a ready means of water supply for fire fighting purposes and that utilises the suction capability of fire department pumpers.
Duff		The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles and leaves and immediately above the mineral soil.
Ease of ignition		The relative speed with which a fire can be started. Picture a traditional braai fire. You start with some newspaper and grass or leaves, then you add some twigs, then some branches and when it's burning properly you add your logs. Grass ignites very easily but burns out fast. The heat from the grass is enough to ignite the twigs and so increases the ease of ignition.
Ecological burning		A form of prescribed burning. It involves the treatment of vegetation by burning it in predetermined season, frequency and intensity to achieve specified ecological objectives.
Ecosystem services		The benefits that people and communities obtain from ecosystems.
Escape route		The route away from dangerous areas on a fire line, which should be pre-planned.
Evacuation		The temporary relocation of persons, their possessions and domestic animals from locations threatened by wildfire to safe areas.
Evacuation zone		A safe area demarcated for the evacuation of communities during extreme wildfires. The zone should protect people from extreme exposure to radiation, flames, aerial embers and smoke.
Exposure		Property that may be endangered by a fire burning in another structure or by a wildfire; or the direction in which a slope faces, usually with respect to cardinal directions; or the general surroundings of a site with special reference to its openness to winds.

TERM	ABBREVIATION	DESCRIPTION
Extended attack		When a fire outstrips the initial attack resources and further resources need to be deployed. The transition from initial to extended attack does not necessarily have a time trigger, e.g. after the first eight-hour resource shift. The trigger is when the initial attack resources have to call in back-up teams because they cannot contain the fire. In extreme fire behaviour conditions, this can even happen before the initial attack resources have got to the fire, e.g. if the fire started at the bottom of a north facing plantation slope with a 40km/h NW wind.
Extreme fire behaviour		A level of wildfire behaviour characteristics that ordinarily precludes methods of direct suppression action. One or more of the following is usually involved: high rates of spread prolific crowning and/or spotting presence of fire whirls a strong convective column Predictability is difficult because such fires often exercise some degree of influence on their environment and behaves erratically, sometimes dangerously.
Fine fuels		Fast-drying dead fuels, generally characterised by a comparatively high surface area-to-volume ratio, which are less than 4mm in diameter. These fuels (grass, leaves, needles, fynbos etc.) ignite readily and are burn rapidly when dry.
Fire		In this context, either a wildfire or a prescribed burn.
Fire activity		A general term for the incidence, kind and behaviour of wildfire; see also fire regime.
Fire behaviour		The manner in which a fire reacts to the variable influences of fuel, weather and topography.
Fire boss		Early term used to identify the Incident Commander, in command of a veldfire operation. This could also refer to the Operations Section Chief in the incident management team.
Fire brigade		Municipalities may have a fire brigade service that is trained and equipped to attend to emergency incidents ranging from hazardous chemical spills to road accidents, but predominantly both structural and veldfires.
Fire climate		The composite pattern or integration over time of the fire weather elements that affect fire occurrence and fire behaviour in a given area.
Fire danger		The sum of constant danger and variable danger factors affecting the inception, spread and resistance to control, and subsequent fire damage; often expressed as an index.

TERM	ABBREVIATION	DESCRIPTION
Fire Danger Index	FDI	Fire Danger Index is an index created to measure the degree of danger of wildfire in an area, its rate of spread and difficulty of suppression. The index is calculated by combining the temperature, humidity, and wind speed. Dry-bulb temperature: the higher the temperature the quicker the fire fuels dry out and the closer the ignition point. Relative humidity: the amount of water vapour available in a parcel of air. The lower the relative humidity the more fuels dry out and the greater the fire risk. Wind speed: the higher the wind speed the faster the fire will move. Previous rainfall: the drier the fuels, the more readily they will burn (fuels get very dry when the rainfall is at its lowest). It is normally denoted by a number out of 100 or by a colour. There are five colour ratings. Blue – 0 to 20 Safe conditions for fire spread Green – 21 to 45 Moderate conditions for fire spread Yellow – 46 to 60 Dangerous conditions for fire spread Orange – 61 to 75 Very Dangerous conditions for fire spread Red – 76 to 100 Extremely Dangerous conditions for fire spread
Fire Danger Rating	FDR	A relative class denoting an evaluation of the rate of spread or suppression difficulty for specific combinations of temperature, relative humidity, drought effects and wind speed. Rated as low, moderate, high, very high or extreme, indicating the relative evaluation of fire danger.
Fire danger region		A region determined according to Section 9(3) of the National Veld and Forest Fire Act for the purposes of fire danger rating.
Fire ecology		The study of the relationships between fire, the physical environment and living organisms.
Fire environment		The surrounding conditions, influences, and modifying forces of topography, fuel and weather that determine fire behaviour.
Fire flank terminology		Where the fire started is the origin, base or tail. Where the fire is spreading forward is called the head. Facing the head, the left hand side of the fire is the left flank. The right hand side is the right flank. Sections of fire breaking away from the fire head or flanks are called fingers.
Fire frequency		A general term referring to the recurrence of fire in a given area over time. Also see “Fire regime”.

TERM	ABBREVIATION	DESCRIPTION
Fire front		The part of a fire within which continuous flaming combustion occurs. Unless otherwise specified, the fire front is assumed to be the leading edge of the fire perimeter. In ground fires, the fire front may be mainly smouldering combustion.
Fire hazard		A fuel complex defined by volume, type, condition, arrangement and location, which determines the degree of ease of ignition and of resistance to control.
Fire hydrant		A valve-type connection on a piped water supply system, having one or more outlets that is/are used to supply hose and fire department pumpers with water.
Fire incidence		The statistical occurrence of fire in a specified geographical area.
Fire intensity (also, Frontal fire intensity)		The rate of energy release per unit length of fire front, usually expressed in kilowatts per metre (Kw/m) (AFAC). The rate of energy release per unit length of fire front, defined by the equation: $I = Hwr$ where I = fireline intensity (kW/m) H = heat yield of fuel (kJ/kg)-16,000 kJ/kg w = dry weight of fuel consumed (kg/m²) (mean total less mean unburnt) r = forward rate of spread (m/s) The equation can be simplified to: $I = w r/2$ where I = fireline intensity (kW/m) w = dry weight of fuel consumed (tonnes/ha) r = forward rate of spread (km/h).
Fire line		Fire line is the term used to define the actively burning wall of fire or flames on the edge of an advancing veldfire.
Fire management		All activities associated with the management of fire-prone land, including the use of fire to meet land-management goals and objectives.
Fire Management Plan		A fire management plan contains concise information on the fire risk and resources in an area, along with strategic and operational information to support informed decision-making.
Fire Management Unit	FMU	A localised area in which Integrated Fire Management efforts between individual landowners can be most effectively coordinated.
Fire preparedness		All activities undertaken in anticipation of and in advance of wildfire occurrence to decrease its extent and severity and to ensure more effective fire suppression.

TERM	ABBREVIATION	DESCRIPTION
Fire prevention		Activities, including education, engineering, enforcement, and administration that are directed at reducing the number of wildfires (particularly those of human origin), the costs of suppression and fire-caused damage to resources and property.
Fire protection		The actions taken to limit the adverse environmental, social, political, and economic effects of fire.
Fire Protection Association	FPA	An association formed for the purpose of predicting, preventing, managing, and extinguishing wildfires, established in terms of section 3(1) and registered in terms of the NVFFA.
Fire Protection Officer	FPO	A person, referred to in sections 5 and 6 of the NVFFA, who is appointed and empowered in terms of the NVFFA to administer an FPA and perform specifically prescribed functions in relation to fire management.
Fire regime		Periods and patterns of naturally occurring fires in a particular area or vegetation type, described in terms of frequency, biological severity, and area extent. For example, frequent, low-intensity surface fires occur in the grasslands on a 1–2 year rotation, while, in the fynbos of the Western Cape, high-intensity fires should occur on a rotation ranging from 10–30 years, depending on the fynbos type.
Fire retardant		Any substance, except water, that by chemical or physical action reduces flammability of fuels or slows their rate of combustion.
Fire risk		Fire risk is determined by assessing, firstly, the likelihood of a wildfire occurring at any given place and, secondly, the consequences should this happen.
Fire risk scenario		A particular fire-hazard scenario, relevant to one or more fire ecotypes, defined to represent the plausible, normative fire risk, and defined in terms of cause, season, fuel conditions, weather, fire behaviour and potential consequence.
Fire season		The periods during which wildfires are likely to occur, spread and do sufficient damage to warrant organised fire control. Typically, the fire season in the northern and eastern reaches of South Africa is during the dry winter months, while in the Western Cape the fire season is during the hot and dry summer months.
Fire severity		The degree to which a fire is destructive of life, property, or the environment. This is usually a function of the duration (residence time) of a fire and its intensity.
Fire service		A fire brigade of a local authority or a fire fighting unit, designated as such by the Minister.
Fire storm		Violent convection caused by a large, continuous area of intense wildfire, often characterised by destructively-violent surface in draughts, a towering convection column, long-distance spotting, and sometimes, by tornado-like whirlwinds.
Fire suppressant		Any agent used to extinguish the flaming and glowing phases of combustion, by direct application to the burning fuel.
Fire tender		A specialised vehicle capable of bringing water, foam or dry chemicals to fire trucks in the field that are engaged on the fire line.

TERM	ABBREVIATION	DESCRIPTION
Fire triangle		Instructional aid in which the sides of a triangle are used to represent the three factors necessary for combustion and flame production - oxygen, heat, and fuel. Removal of any of the three factors causes flame production to cease, i.e. the fire to be extinguished.
Fire weather		Weather conditions that influence fire ignition, behaviour and suppression.
Fire whirl		Spinning vortex column of ascending hot air and gases rising from a fire and carrying aloft smoke, debris and flame. Fire whirls range in size from less than half a metre to over 140m in diameter. Large fire whirls have the intensity of a small tornado.
Firebreak		A natural or man-made change in fuel characteristics which affects fire behaviour so that fires burning into them can be more readily stopped or checked, or provides a control line from which to work. Under favourable conditions an adequate firebreak may stop a fire. However, under adverse fire conditions, it is a place to gain access to fight the fire indirectly through methods such as burnout and back burning. Chapter 4 of the NVFFA provides that a firebreak: - is wide enough and long enough to have a reasonable chance of preventing a wildfire from spreading to or from neighbouring land; - does not cause soil erosion; and - is reasonably free of flammable material capable of carrying a wildfire across it. A very practical judge of width under normal conditions is 1.5 – 2 times the width of the highest fuel, immediately adjacent to the break. This comes from the scientific fact that when combustible material burns it releases gases that cause a flame height of 1.5 to 2 times the height of the fuel. This flame can be blown flat, hence the width factor. This does not take into account the fire spotting.
Fire ecology type		A class of vegetation types that is relatively uniform in terms of the fire regimes within the constituent vegetation types.
Fire-proofing		Removing or treating fuel with fire retardant to reduce the danger of fires igniting or spreading (e.g. fire-proofing roadsides, campsites or structural timber). Protection is relative, not absolute.
Firewise construction		The use of materials and systems in the design and construction of a building or structure to safeguard against the spread of fire within a building or structure, and the spread of fire to or from buildings or structures to the Wildland-Urban Interface area.
Firewise landscaping		Vegetative management that removes flammable fuels from around a structure to reduce exposure to radiant heat. The flammable fuels may be replaced with green lawn, gardens, certain individually spaced green ornamental shrubs, individually spaced and pruned trees, decorative stone or other non-flammable or flame-resistant materials.
Flame		A mass of gas undergoing rapid combustion, generally accompanied by evolution of sensible heat and incandescence.

TERM	ABBREVIATION	DESCRIPTION
Flame length		The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.
Flammability		The relative ease with which fuels ignite and burn, regardless of the quantity of the fuels.
Flammable		Capable of being ignited and of burning with a flame.
Fire Management Unit leader	FMU leader	Leadership chosen by members of that FMU. They represent members in their areas regarding FPA matters.
Foam		The aerated solution created by forcing air into or entraining air in water containing a foam concentrate, by means of suitably-designed equipment, or by cascading it through the air at a high velocity. Foam reduces combustion by cooling, moistening and excluding oxygen.
Forest		An area, incorporating all living and non-living components, that is dominated by trees, having usually a single stem and a mature or potentially mature stand height exceeding 2m, and with existing or potential crown cover of overstorey strata about equal to or greater than 20%. This definition includes South Africa's diverse native forests, woodlands and plantations, regardless of age (see National Forests Act).
Forest fire		A fire burning mainly in forest and/or woodland.
Forward rate of spread	FROS	The speed with which a head fire moves in a horizontal direction across the landscape.
Fuel		Combustible material including vegetation and structures. Fuel can include everything from trees, underbrush and dry grassy fields to homes. Related terms include: available fuel, coarse fuel, dead fuel, ground fuel, elevated dead fuel, fine fuel, ladder fuels, surface fuels and total fine fuel.
Fuel age		The period of time that has lapsed since the fuel was last burnt.
Fuel break		An area, strategically located for the fighting of anticipated fires, where the native vegetation has been permanently modified or replaced so that fires burning into it can be more easily controlled. Fuel breaks divide fire-prone areas into smaller areas for easier fire control and to provide access for fire fighting.
Fuel condition		Relative flammability of fuel as determined by fuel type and environmental conditions.
Fuel load		The volume of fuel in a given area (the oven dry weight) per unit area. Generally expressed in tons per acre. (Also known as fuel loading)
Fuel modification		Any manipulation or removal of fuels to reduce the likelihood of ignition or the resistance to fire control.
Fuel moisture content		The water content of a fuel expressed as a percent of the oven dry weight of the fuel particle (% ODW).

TERM	ABBREVIATION	DESCRIPTION
Fuel reduction		Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.
Fuel reduction burning		The planned application of fire to reduce hazardous fuel quantities, undertaken in prescribed environmental conditions within defined boundaries.
Greenbelt		A fuel break designated for use other than fire protection.
Ground fire		A fire that is burning below the surface of the ground in roots, peat, coal, decaying plant material etc.
Ground fuels		All combustible materials located on the ground that typically supports combustion such as grass, duff, loose surface litter, tree or shrub roots, rotting wood, leaves, peat, or sawdust.
Hazard		(1) A source of potential harm or a situation with potential to cause loss. (2) The degree of flammability of the fuels once a fire starts. This includes the fuel (type, arrangement, volume, and condition), topography and weather.
Hazard reduction		Any treatment of living and dead fuels that reduces the threat of ignition and spread of fire.
Hazardous areas		Those uncontrolled wildfire areas where the combination of vegetation, topography, weather and the threat of fire to life and property create difficult and dangerous problems.
Heavy fuels		Combustible material with a diameter between your wrist and your thigh. This material needs sustained heat to ignite, e.g. big logs. Also called 100-hour fuels because, under ideal conditions, they get saturated or dry within 100 hours. There is another heavy fuel type categorised as a 1 000-hour fuel. These are any fuels bigger than your thigh, e.g. large downed trees.
Horizontal fuel		Combustible material that is lying down horizontally.
Human-caused fire		Any fire caused directly or indirectly by a person.
Humus		Layer of decomposed organic matter on the forest floor, beneath the fermentation layer and directly above the soil. It is that part of the duff in which decomposition has rendered vegetation unrecognisable and mixing of soil and organic matter is underway.
Hydrant		A discharge pipe with three valves and fittings at which water can be drawn from a water main or other source, for the purpose of fighting fires.
Ignition		The beginning of flame production or smouldering combustion; where rapid oxidation occurs and self-sustained combustion occurs.
Ignition probability		Chance that a firebrand will cause an ignition when it lands on receptive fuels.
Ignition source		A source of energy sufficient to initiate combustion.
Ignition time		The time between the application of an ignition source to a fuel and when the fuel reaches self-sustained combustion.

TERM	ABBREVIATION	DESCRIPTION
Incident		In this context it refers to a fire.
Incident Command System	ICS	An emergency management tool, used at incidents by all types and levels of emergency services, to ensure standardisation and efficiency, and that: - is adaptable and scalable to any type or size of event; - is suitable for use regardless of jurisdictions or agencies involved; - employs a common organisation structure; - utilises common communication and structures and consolidated action planning; and - utilises common terminology.
Incident Commander	IC	The person in charge of the fire or incident.
Indirect attack		A method of suppression in which a control line is located some considerable distance away from the fire's active edge. Generally done in the case of a fast-spreading or high-intensity fire and utilising natural or constructed firebreaks, fuel breaks and favourable breaks in the topography. The intervening fuel is usually burnt out, but occasionally, depending on conditions, the main fire is allowed to burn to the control line.
Initial attack		The actions taken by the first resources on arrival at a wildfire to protect lives and property and to prevent further spread of the fire. Usually done by small, fast acting and localised teams with limited resources, and takes place immediately after size-up. The motto is 'hit hard and hit fast'.
Integrated Fire Management	IFM	The holistic and systematic approach to the management of wildfires, which seeks to combine all stakeholders and the various management efforts into a single, albeit diversified, strategy.
King Report on Corporate Governance	King	A groundbreaking code of corporate governance in South Africa issued by the King Committee on Corporate Governance. Three reports were issued in 1994 (King I), 2002 (King II) and 2009 (King III). Compliance with the King Reports is a requirement for companies listed on the Johannesburg Stock Exchange.
Kloof		Ravine, or deep narrow valley.
Ladder fuels		Fuels that provide vertical continuity allowing fire to climb from surface fuels into the crowns of trees or shrubs with relative ease. They can also lead fires from garden vegetation to structural roofs.
Light fuels		Combustible material with a diameter of less than a thumb. It ignites very easily but does not burn for a long time, e.g. grass. Also called 1-hour fuels because, under ideal conditions, they get saturated or dry within one hour.
Live fuels		Living matter burns. A living plant under drought and heat stress can have less moisture content than a dead plant that has fully turgid cells. Live fuel moisture content is governed more by the health of the plant than by the atmosphere, but they are linked.

TERM	ABBREVIATION	DESCRIPTION
Medium fuels		Combustible material with a diameter of between thumb and wrist thick. It ignites with sustained heat and burns for longer than grass, e.g. twigs and branches. Also called 10-hour fuels because, under ideal conditions, they get saturated or dry within 10 hours.
Mega-fires		A wildfire or concurrent series of wildfires that is in the upper percentile of the fire regime.
Member		A natural or legal person that has registered with an FPA and has paid up membership fees.
Mitigation		Any risk management measure or action that moderates the severity of a fire hazard or reduces risk, including fuel-reduction burning, other prevention measures, and preparedness, etc.
Mountain catchment area		A mountainous region assigned specific protection in terms of the Mountain Catchment Areas Act (Act 63, of 1970), with the intention of ensuring a sustained yield of high-quality water throughout the year.
National Fire Danger Rating System	NFDRS	A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels.
National Umbrella Fire Protection Association	NUFPA	Committee representing all FPAs and UFPAs on a national level, established to provide guidance, input and the opportunity to share best practices to all member FPAs and UFPAs.
National Veld and Forest Fire Act 101 of 1998	NVFFA	This Act governs FPAs and identifies landowner responsibilities in terms of fire prevention.
Natural barrier		Any area where lack of flammable materials or physical constraints limit the spread of a fire.
Non-combustible		A material that, in the form in which it is used and under the conditions anticipated, will not aid combustion or add appreciable heat to an ambient fire.
Non-natural deaths		All deaths that were not due to, or may not have been due to, natural causes and that in terms of the Inquests Act are subject to medico-legal investigation.
North-facing slope		In the southern hemisphere the north-facing slopes receive extended direct sunlight. As a result, the slope is inherently dryer and the vegetation is generally made up of light fuels more inclined to flash fire.
Open burning		Burning of wastes in the open or in an open dump.
Out of control fire		A fire that has reached the intensity where no attempt is or can be made to stop the head of the fire with a direct attack. Only the flanks can be attacked.
Overstorey		The portion of the trees in a forest that form the upper or uppermost layer.

TERM	ABBREVIATION	DESCRIPTION
Parallel attack		When the fire line is too hot for the firefighters to safely attack the flames directly, generally occurring when the flames are higher than 1.8m. Firefighters then, generally, move back to a safe distance, $\pm 10\text{m}$ off the flank, and prepare a containment line from which to fight the fire. Parallel attack typically includes burning out the fuel between the containment line and the fire.
Peak fire season		The period of the fire season during which fires are expected to ignite most readily, to burn with greater than average intensity, and to create damages at an unacceptable level.
Plantation		A stand of trees or bushes planted and cultivated in rows, at even spaces.
Point of ignition or Fire origin		The place where a fire was started or ignited.
Preparedness		All activities undertaken in advance of the occurrence of an incident to decrease the impact, extent and severity of the incident, to ensure more effective response activities, to recognise changes in fire danger, and to act promptly when action is appropriate.
Prescribed burn		A fire utilised for prescribed burning.
Prescribed burning		The controlled application of fire, under specified environmental conditions, to a predetermined area and at the time, intensity, and rate of spread required to achieve planned resource management objectives. Generally, it requires the specific authorisation of the fire management authority.
Prescribed fire		Any fire ignited by management or on the instructions of management to meet specific objectives. A written, approved burn plan must exist, and approving agency requirements (where applicable) must be met, prior to ignition.
Prevention		All activities concerned with minimising the occurrence of incidents, particularly those of human origin.
Probability		A measure of the chance of occurrence expressed as a number between 0 and 1, for a specified time period, and linked to asset of conditions.
Rate of spread	ROS	The speed with which a fire moves in a horizontal direction across the landscape, at a specified part of the fire perimeter. (See also Forward rate of spread.)
Reaction time		The time taken between the report of a fire or incident and the departure of the crew.
Recovery		The coordinated process of supporting emergency-affected communities in reconstruction of the physical infrastructure, and restoration of emotional, social, economic, and physical wellbeing.
Residual risk		The risk that remains in unmanaged form, even when effective, disaster risk-reduction measures are in place, and for which emergency response and recovery capacities must be maintained.
Resilience		The capacity of an ecosystem to recover after disturbance.

TERM	ABBREVIATION	DESCRIPTION
Response		Actions taken in anticipation of, during and immediately after an incident, to ensure that its effects are minimised, and that people affected are given immediate relief and support.
Retardant		A substance or chemical agent that reduces the flammability of combustible material.
Risk		The exposure to the possibility of such things as economic or financial loss or gain, physical damage, injury or delay, as a consequence of pursuing a particular course of action. The concept of risk has two elements, i.e. the likelihood of something happening and the consequences if it happens.
Risk analysis		A systematic use of available information to determine how often specific events may occur, and the magnitude of their likely consequences.
Risk assessment		The overall process of risk identification, risk analysis and risk evaluation.
Risk evaluation		Process of comparing the level of risk against risk criteria.
Risk factor		An underlying, natural or human cause of a given level of risk.
Risk identification		The process of determining what, where, when, why and how something could happen.
Risk management		The culture, processes and structures that are directed towards realising potential opportunities, while managing adverse effects. Application of available resources in such a way that overall risk is minimised.
Risk management framework		Set of elements of an organisation's management system concerned with managing risk.
Risk management process		The systematic application of management policies, procedures and practices to the tasks of communicating, establishing the context, identifying, analysing, evaluating, treating, monitoring and reviewing risk.
Risk mitigation		An alternate expression for risk reduction.
Risk reduction		Actions taken to lessen the likelihood, negative consequences, or both, associated with a risk.
Rural		Any area where residences and other developments are scattered and intermingled with forest, range or farm land and native vegetation, or cultivated crops.
Slope		The variation of terrain from the horizontal, expressed either as a gradient 1 in 20, i.e. a 1m rise in 20 metres, or as a percentage, or as an angle where horizontal represents 0° and vertical 90°.
Smoke		(1) The visible products of combustion rising above a fire. (2) Term used when reporting a fire or probable fire in its initial stages.

TERM	ABBREVIATION	DESCRIPTION
South-facing slope		In the southern hemisphere the south-facing slope is inherently wetter, as it does not get directly exposed to the sun, and the vegetation is dominated by multi-story, closed canopy natural forests and denser vegetation types.
Specific risk scenario		A written description of the specific risk, which contains all the necessary information to make a justifiable risk evaluation, described in a way that is meaningful and unambiguous.
Spot fire		An isolated fire started ahead of the main fire by sparks, embers or other ignited material; sometimes at a distance of several kilometres.
Spotting		Behaviour of a fire producing sparks or embers that are then carried by the wind and start new fires beyond the zone of direct ignition of the main fire, and which serve as independent ignition points. They often greatly increase the rate at which a fire spreads. Short range spotting, of less than 500m, can occur in any fuels and is more likely when the relative humidity is below 40%, and is almost certain when the relative humidity reaches 25% or less. In addition, air temperatures above 16°C (60°F) and wind speeds over 32km/h (20mph) significantly increase the chance of firebrand ignitions.
Structural fire protection		The protection of a structure from interior and exterior fire ignition sources. This fire protection service is normally provided by municipal fire departments with trained and equipped personnel. After life safety, the agency's priority is to keep the fire from leaving the structure of origin or to protect the structure from an advancing uncontrolled wildfire. (The equipment and training required to conduct structural fire protection is not normally provided to the uncontrolled veld firefighter.) Various taxing authorities fund this service.
Structural fire		A fire originating in, or burning any part or all of, a building or shelter.
Suppression		Efforts to actively fight a fire, contain it, or extinguish it.
Surface fire		Fire that moves through combustible material located on the ground.
Surface fuel		Fuels lying on or near the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones and low-stature living plants.
Survivable space		The characteristics of a home such as its materials and design, as well as the flammable materials in its immediate surroundings, that results in high ignition resistance from flames and firebrands (burning embers). Survivable space characteristics relate to the ignitability of a home, without necessarily including the higher thermal vulnerability of firefighters.
Tracer		Access line, generally with little or no combustible material, from which to start a burn.
Tree crown		The primary and secondary branches growing out from the main stem, together with twigs and foliage.

TERM	ABBREVIATION	DESCRIPTION
Umbrella Fire Protection Association	UFPA	An umbrella association may be established for a number of fire protection associations that may exercise powers under NVFFA or perform duties in terms of this Act on behalf of a fire protection association, if the Minister agrees.
Uncontrolled fire		Any fire that threatens to destroy life, property, or natural resources, and (a) is not burning within the confines of firebreaks, or (b) is burning with such intensity that it could not be readily extinguished with ordinary, commonly available tools.
Understorey		Low-growing vegetation (herbaceous, brush or reproduction), growing under a stand of trees. Also, that portion of trees in a forest stands below the overstorey.
Unintentional injury, deaths		Includes all other unintentional, non-transport injuries such as those due to burns, falls, poisoning and drowning.
Urban interface		Any area where wildfire fuels threaten to ignite combustible homes and structures.
Values at risk		The natural resources or an improvement that may be jeopardised if a fire occurs.
Veld		Undeveloped and uncultivated area of natural vegetation.
Veldfire		Described in the NVFFA as “a veld, forest or mountain fire”. A vegetation fire outside the urban-rural interface; a general term to describe fire in vegetation. In this context these forms of fire are collectively referred to as “wildfires”.
Vertical fuel		Combustible material that has a vertical profile, including material that is standing up.
Volunteer firefighter		A legally enrolled and trained firefighter under the fire department organisation laws who devotes time and energy to community fire service, without compensation other than workers’ compensation or other similar death and injury benefits.
Vulnerability		The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.
Water supply		A source of water for fire fighting activities.
Wildfire		A vegetation fire accidentally igniting or deliberately ignited, but burning out of control, including veld and forest fires.
Wildland fire		A fire burning outside the urban areas, either as a prescribed burn or as a wildfire.
Wildland Urban Interface	WUI	The line, area or zone where structures and other human development adjoin or overlap with undeveloped natural areas.
Wind Direction		The cardinal point from where the wind originates, i.e. a northwester or north-westerly wind comes from the north west but flows in a south-easterly direction.
Wind speed descriptions		See “Beaufort Scale”.
Working on Fire	WoF	An Extended Public Works Programme providing trained firefighters and fire management services.



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