O.R. TAMBO DISTRICT

MUNICIPALITY

MASTER FIRE PLAN

2020

Prepared by FDD Fire Engineering (Pty) Ltd

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Contents

List of Figures

List of Tables

1. Introduction

FDD Fire Engineering were contracted by Messrs SRK (Pty) Ltd to undertake a study on the status of fire protection in the Oliver Tambo District Municipality, "ORTDM" and prepare a Fire and Rescue Master Plan with a road map for the way forward. The study was done by visiting the main towns in the district, conducting face-to-face interviews and by conducting telephonic interviews.

In planning for a modern fire and rescue service for ORTDM the following factors were considered.

1.1 Economic Overview

The South African economy has been severely negatively impacted by COVID-19 and ORTDM will not escape these economic forces. As accurate data is not currently available to predict and quantify future economic trends, this report will be based on the latest available data and qualitative adjustments will be made to conclusions and recommendations.

The recommendations contained in this report will be aligned with the ***Eastern Cape Vision 2030*** (Eastern Cape Vision 2030 Provincial Development Program, 2014)plan and the IDP's of the local municipalities. The four priorities of ***Vision 2030*** are as follows:

- Redistributive, inclusive, and spatially equitable economic development and growth
- Quality health
- Education, training, and innovation
- Institutional capabilities

Based on 2016 data, the ORTDM has a population of 1.476 million people, which is 2,6% of South Africa's total population and 21% of the population of the Eastern Cape.

DISTRICT MUNICIPALITY	PERCENTAGE OF EASTERN CAPE POPULATION
OR Tambo	21%
Nelson Mandela Bay	18%
Buffalo City	12%
Alfred Nzo	12%
Amatole	12%
Chris Hani	12%
Sarah Baartman	7%
Joe Gqabi	6%

Table 1-1: Eastern Cape District Municipalities Population

Within the DM, the population breakdown between municipalities is as follows:

MUNICIPALITY	POPULATION	PERCENTAGE
Ngquza Hill	304,000	20.6%
Port St Johns	168,000	11.4%
Nyandeni	313,000	21.3%
Mhlontlo	194,000	13.2%
King Sabata Dalindyebo	494,000	33.5%
OR Tambo	1,472,366	100%

Table 1-2: Population of Local Municipalities

With a GDP of R37,9 billion (2016), the ORTDM contributes 11,2% to the economy of the Eastern Cape. The DM ranks third relative to the regional economies of the Eastern Cape Province, after Nelson Mandela Bay (36%) and Buffalo City (20%).

Within the DM, the economic contribution of the local municipalities is as follows:

MUNICIPALITY	GDP (billion)	PERCENTAGE
Ngquza Hill	4.33	11.4%
Port St Johns	2.41	6.4%
Nyandeni	2.73	7.2%
Mhlontlo	3.84	10.1%
King Sabata Dalindyebo	24.61	64.9%
OR Tambo	37.91	100%

Table 1-3: Local Municipality Economic Contribution

The development of the fire and rescue service master plan takes the level of economic activity of the region into account that must sustain the ongoing expenditure to maintain the emergency services.

1.2 Integration with ORTDM: Regional Fire and Rescue Service

Given the predominant rural nature of ORTDM it is more cost effective to establish a regional fire and rescue service than duplicating resources such as training facilities and hazardous materials response equipment in smaller communities. Some types of incidents do not occur often, but provision must be made by the municipality to deal with them effectively and safely. For example, a chemical spill on the N2 within the ORTDM region does not occur often, but the local fire and rescue services must have the equipment, personnel, and training to deal with the incident safely and to minimise impact on the environment. It is better to have a well-resourced response with trained and experienced personnel, strategically located, than numerous under-resourced units responding to the incident.

The recommendations concerning the distribution of fire stations, vehicles, equipment, and personnel has taken these factors into account. The recommendation is made that a regional fire and rescue service must be established within ORTDM.

1.3 Smart Village

The South African rural landscape is changing as people move to cities to access services and economic opportunities. This places rural communities under pressure and public services in such communities tend to deteriorate due to the higher cost per person to provide services. This is an international phenomenon and not only encountered in rural South Africa.

Emerging digital technologies have the potential to reverse this trend and ensure that rural communities can access quality services and knowledge, currently only available in large urban areas. The generally accepted definition of a smart villages is as follows: "Smart villages are communities in rural areas that use innovative solutions to improve their resilience, building on local strengths and opportunities. They rely on a participatory approach to develop and implement their strategy to improve their economic, social, and/or environmental conditions, in particular by mobilising solutions offered by digital technologies. Smart Villages benefit from co-operation and alliances with other communities and actors in rural and urban areas. The initiation and the implementation of Smart Villages strategies may build on existing initiatives and can be funded by a variety of public and private sources."

A smart village is being trialled by the Public Sector ICT Forum in Limpopo. The ambition was that if the trial is successful to roll the technology out to other provinces. We support the initiative as it can assist rural communities access world class services and information that is currently only available in larger towns and cities. This places rural communities at a disadvantage and encourages the depopulation of such communities.

We will be recommending that the smart village concept be trialled in one of the ORTDM local municipalities. Of particular interest for the fire service is the ongoing monitoring of fire alarms at critical installations, such as hospitals. Our proposal will be based on the objective of improving fire prevention, thereby reducing the number and severity of fires which will permit a leaner and more affordable fire fighting service.

A proposal will also be made that annual surveys be done of the urban/wildland interface around the major towns in the ORTDM and that by using artificial intelligence, areas be identified for risk mitigation before the start of the veldfire season.

1.4 Goals of Study

The goals of the study that will be encapsulated in the recommendations of this report are as follows:

1.4.1 Efficiency

It is recognised that the operational costs of a fire and rescue service is high. The consultants have achieved a cost-effective approach to providing adequate community fire safety by balancing fire prevention, public education, and operational aspects of a fire service.

The placement of fire appliances that respond to incidents have also been placed at locations that provide the most efficient response to the risks within the area.

1.4.2 Regional service (command and control, call taking, training)

A professional fire and rescue service that provides a value driven service to the community that it serves needs key resources that are expensive to establish on a small scale. To name two examples:

- A community must have access to fire safety training courses presented to school children to encourage fire-safe behaviour throughout their lives. This pays dividends in the long run and reduces the causes and severity of fires in a community. A professional fire educator is required and in the case of ORTDM it is more effective to have one such incumbent, well resourced, based in Mthatha offering a service throughout the DM , than having five such persons, one per local municipality.
- A fire service needs access to breathing apparatus. This is an essential component of a fire service health and safety program. Breathing apparatus need to be recharged with a BA compressor and require regular ongoing maintenance. Once again, it is far more cost effective to install fixed cascade breathing apparatus equipment at a central location in Mthatha and establish a breathing apparatus workshop with a trained maintenance officer, than trying to duplicate such equipment throughout the five local municipalities.

The proposed fire and rescue service for ORTDM has been designed to address the findings of the risk assessment and the service has been developed on a regional scale. It will be recommended that the following functions be provided on a regional scale (and not at individual local municipalities):

- Command and control of large incidents
- Regional fire service training
- Regional fire safety officer
- Regional fire educator
- Regional fire investigation
- Call taking and statistics
- Advanced hazardous materials response team
- Breathing apparatus maintenance and bulk cylinder testing and refilling

1.4.3 Smart City/Smart Village

The study encourages the use of Smart City/Smart Village Technology as a means to improving the level fire protection in the ORTDM.

1.4.4 Support Economic Development

During the site visit it was noted that opportunities exist for SMME's within the fire protection industry to be established within the region and this report will highlight these opportunities. Currently a large number of the service providers are based in other district municipalities, such as Buffalo City. The development of a local fire service industry in ORTDM is encouraged as this could lower the cost of the provision of such services to the community. An example of such a business is the servicing and maintenance of fire equipment.

1.4.5 Minimise loss due to Fire

The primary functions of a fire and rescue services is as follows:

- Save lives
- Protect property from fire
- Deliver a humanitarian service
- Reduce impact of incidents on the environment

The proposed fire and rescue service addresses these functions.

1.4.6 Support the ORTDM in IDP's

The proposed fire and rescue service has been developed to support the ORTDM in its mission to improve service delivery in a cost effective manner to the citizens.

1.4.7 Improve resilience

The proposed fire and rescue service has been developed to improve the resilience of the community to fires and other disasters. A fire and rescue service is uniquely placed to dispatch trained personnel and specialised equipment to emergencies at short notice. The fire service can therefore play a key role in assisting the community during times of emergencies or disasters thereby improving community resilience.

1.5 Designated Service

The Mthatha Airport is protected by a dedicated fire service. In terms of the Fire Brigade Services Act, the airport fire service is classified as a designated service. The designated service status implies that although the Mthatha Airport Fire Service lies within the judicial area of the ORTDM, the DM has no jurisdiction over the airport fire service.

The Mthatha Airport Fire Service is however an essential resource within the community and a mutual aid agreement must be concluded between the two parties.

2. Fire Risk Assessment

2.1 Structural Risk Assessment

A fire protection risk assessment has been completed at the nine larger towns within the DM. These towns comprehensively cover the significant fire risks within the DM. Based on the predominant structural fire risk in each town, a Risk Grading has been assigned. The risk categories are described as follows in SANS 10090 (Standards South Africa, 2003):

Fire-risk categories

A fire area should be divided into sub-areas which fall into one of the following fire-risk categories:

Category A: Central business districts and extensive commercial and industrial areas normally found in cities and large towns (areas where the risk to life and property due to fire occurrence and spread is likely to be high).

Category B: Limited central business districts, smaller commercial or industrial areas normally associated with small towns and decentralized areas of cities and large towns (areas where the risk to life and property due to fire occurrence and spread is likely to be moderate).

Category C: Residential areas of conventional construction.

Category D: Rural areas of limited buildings and remote from urban areas.

Category E: Special risk areas. Individual areas requiring a pre-determined attendance over and above the predominant risk category in an area. Includes large shopping/entertainment centres, informal settlements, harbours, hospitals, prisons, large airport buildings and petrochemical plants.

The most prevalent risk throughout the ORTDM is Category D, with higher categories in the larger towns and Mthatha. The risk classification of the significant towns is as follows;

2.1.1 Flagstaff

Flagstaff is the seat of the Ingquza Hill Local Municipality and is located 45 km north of Lusikisiki on the R61.

Parameter	Result	Comment
Municipality	Ingquza Hill Local Municipality	Seat of municipality
Population	4821	
Area	2.7 km2	
Population Density	1800/km2	High population density
Predominant Fire Risk	B	
Predominant Wildfire Risk		
Hospital	Yes	Holy Cross Mission, at Taweni
Proximity to N2	No	
Airfield	No	
Distance to Closest Fire Station (proposed)	42 km	
Geolocation	-31°5'7.198" , 29°29'35.6895"	

Table 2-1: Flagstaff

Figure 2-1: Flagstaff

2.1.2 Libode

Libode is located on the R61, between Mthatha and Port St Johns.

Parameter	Result	Comment
Municipality	Nyadeni Local Municipality	Seat of municipality
Population	3835	
Area	33.68 km^2	
Population Density	114/km^2	
Predominant Fire Risk	B	
Predominant Wildfire Risk		
Hospital	Yes	St Barnabas
Proximity to N2	No	
Airfield	No	
Distance to Closest Fire Station (proposed)	34 km	Distance to Mthatha
Geolocation	31°32'S, 29°01'E	

Table 2-2: Libode

Figure 2-2: Libode

2.1.3 Lusikisiki

Lusikisiki is located on the R21, close to Port St Johns.

Parameter	Result	Comment
Municipality	Ingquza Hill Local Municipality	
Population	9079	
Area	21.04 km2	
Population	9079	
Population Density	432	
Predominant Fire Risk	B	
Predominant Wildfire Risk		
Hospital	Yes	St Elizabeth's Mission
Proximity to N2	No	
Airfield	No	
Distance to Closest Fire Station (proposed)	42 km	
Geolocation	31.368°S, 29.576°E	

Table 2-3: Lusikisiki

Figure 2-3: Lusikisiki

2.1.4 Mqanduli

Mqanduli is located close to Mthatha.

Parameter	Result	Comment
Municipality	King Sabata Dalindyebo Municipality	
Population	2647	
Area	9.88 km2	
Population Density	21	
Predominant Fire Risk	C	
Hospital	Yes	Zithulele Hospital
Predominant Wildfire Risk		
Proximity to N2	No	
Airfield	No	
Distance to Closest Fire Station (proposed)	34 km	
Geolocation	31° 49'S, 28°45'E	

Table 2-4: Mqanduli

Figure 2-4: Mqanduli

2.1.5 Mthatha

Mthatha is the main town of the King Sabata Dalindyebo Local Municipality and the capital of the OR Tambo District Municipality.

Parameter	Result	Comment
Municipality	King Sabata Dalindyebo Local Municipality	Seat of municipality
Population	210 783	
Area	54.97 km^2	
Population Density	3 800/km^2	
Predominant Fire Risk	A	
Hospital	Yes (three)	Life St Mary's, Mthatha Private, Nelson Mandela Academic
Predominant Wildfire Risk		
Proximity to N2	Yes	
Airfield	Yes	2000 metre tar runway
Distance to Closest Fire Station (proposed)	34 km	
Geolocation	31°34'00"S, 28°46'00"E	

Table 2-5: Mthatha

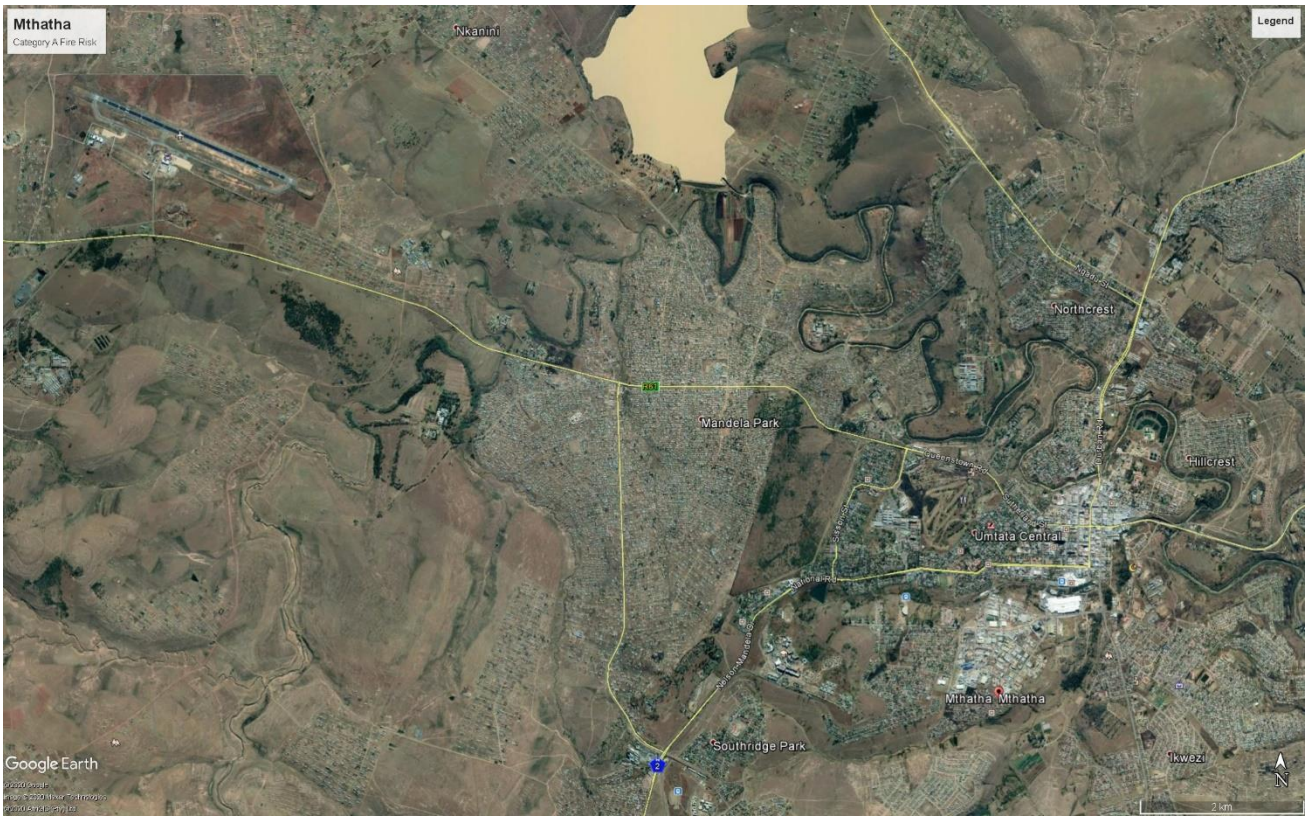


Figure 2-5: Mthatha

2.1.6 Ngqeleni

Ngqeleni is located close to Mthatha.

Parameter	Result	Comment
Municipality	Nyandeni Local Municipality	
Population	2062	
Area	15.17 km^2	
Population Density	136/km^2	
Predominant Fire Risk	C	
Hospital	Yes	Canzibe Hospital
Predominant Wildfire Risk		
Proximity to N2	No	
Airfield	No	
Distance to Closest Fire Station (proposed)	34 km	
Geolocation	31° 49'S, 28°45'E	

Table 2-6: Ngqeleni

Figure 2-6: Ngqeleni

2.1.7 Port St Johns

Port St Johns is a coastal town of significant tourist potential.

Parameter	Result	Comment
Municipality	Port St Johns Local Municipality	Seat of municipality
Population	6441	
Area	8.03 km^2	
Population Density	800/km^2	
Predominant Fire Risk	C	
Hospital	Yes	Isimela Hospital at Gomolo
Predominant Wildfire Risk		
Proximity to N2	No	
Airfield	Yes	900 metre, tar
Distance to Closest Fire Station (proposed)	70 km	
Geolocation	31.6288°S, 29.5359°E	

Table 2-7: Port St Johns

Figure 2-7: Port St Johns

2.1.8 Qumbu

Qumbu is located 61 km north of Mthatha close to the N2.

Parameter	Result	Comment
Municipality	Mhlontlo Local Municipality	Seat of municipality
Population	4928	
Area	42.31 km^2	
Population Density	116/km^2	
Predominant Fire Risk	B	
Hospital	Yes	Nessie Knight Hospital
Predominant Wildfire Risk		
Proximity to N2	Yes	
Airfield	No	
Distance to Closest Fire Station (proposed)	33 km	
Geolocation	31.161667°S, 28.868056°E	

Table 2-8: Qumbu

Figure 2-8: Qumbu

2.1.9 Tsolo

Tsolo is located 42 km north-west of Mthatha, close to the N2.

Parameter	Result	Comment
Municipality	Mhlontlo Local Municipality	
Population	7794	
Area	18.05 km^2	
Population Density	170/km^2	
Predominant Fire Risk	B	
Hospital	Yes (two)	St Lucy's and Dr. Malizo Mpehle
Predominant Wildfire Risk		
Proximity to N2	Yes	
Airfield	No	
Distance to Closest Fire Station (proposed)	33 km	
Geolocation	31.316667°S, 28.75°E	

Table 2-9: Tsolo

Figure 2-9: Tsolo

2.2 Traffic Accident and Hazmat Risk Assessment

A key responsibility of the fire service is to respond to road traffic accidents and chemical incidents. There are a number of roads in the ORTDM that carry a high volume of traffic and also has high accident statistics. These factors were considered when assessing the response capacity required by the fire service in the region to respond to such incidents.

A study in 2018 conducted by ***Arrive Alive*** (Arrive Alive, 2018)based on data obtained from the Road Traffic Management Corporation found that there are four roads in the ORT region that are particularly hazardous.

- N2 from East London to Mthatha (Ranked as #1 Most Dangerous in SA)
- N2 from Mthatha to Kokstad (Ranked as #2 Most Dangerous in SA)
- R61 from Port St Johns to Bizana (Ranked as #12 Most Dangerous in SA)
- R61 Mthatha to Queenstown (Ranked as #15 Most Dangerous in SA)

A variety of hazardous chemicals are transported by road through the region. These include the following chemicals that are commonly transported by road:

- Petrol
- Diesel
- LP Gas
- Chlorine
- Carbon dioxide
- Ammonia

Based on the distribution of traffic accidents and the transport of hazardous chemicals, the creation of capacity will be proposed within the regional fire service to respond to traffic accidents and hazardous chemical incidents. Hazardous materials response units will be stationed in Mthatha, Libode, Qumbu and Port St Johns.

Additional resources will be created in Mthatha to support units responding from Libode, Qumbu or Port St Johns if circumstances require fire fighters with more advanced equipment or training.

2.3 Wildfire Risk Assessment

The risk of the occurrence of veldfires in the ORTDM over the past decade has caused a number of wildfires to occur in the district. This information is corroborated by the Eastern Cape Umbrella Fire Protection Association (Eastern Cape Umbrella Fire Protection Association, 2017). These fires impact on the community by destroying agricultural settlements, killing animals, and placing people's lives at risk.

Fires are increasing in scale and frequency. Climate change is affecting wildfire management and control. The growing wildland urban interface, "WUI", is creating challenges of uncontrolled access with the risk of anthropomorphic activity causing fires, as well as fire spread to urban structures that can lead to litigation.

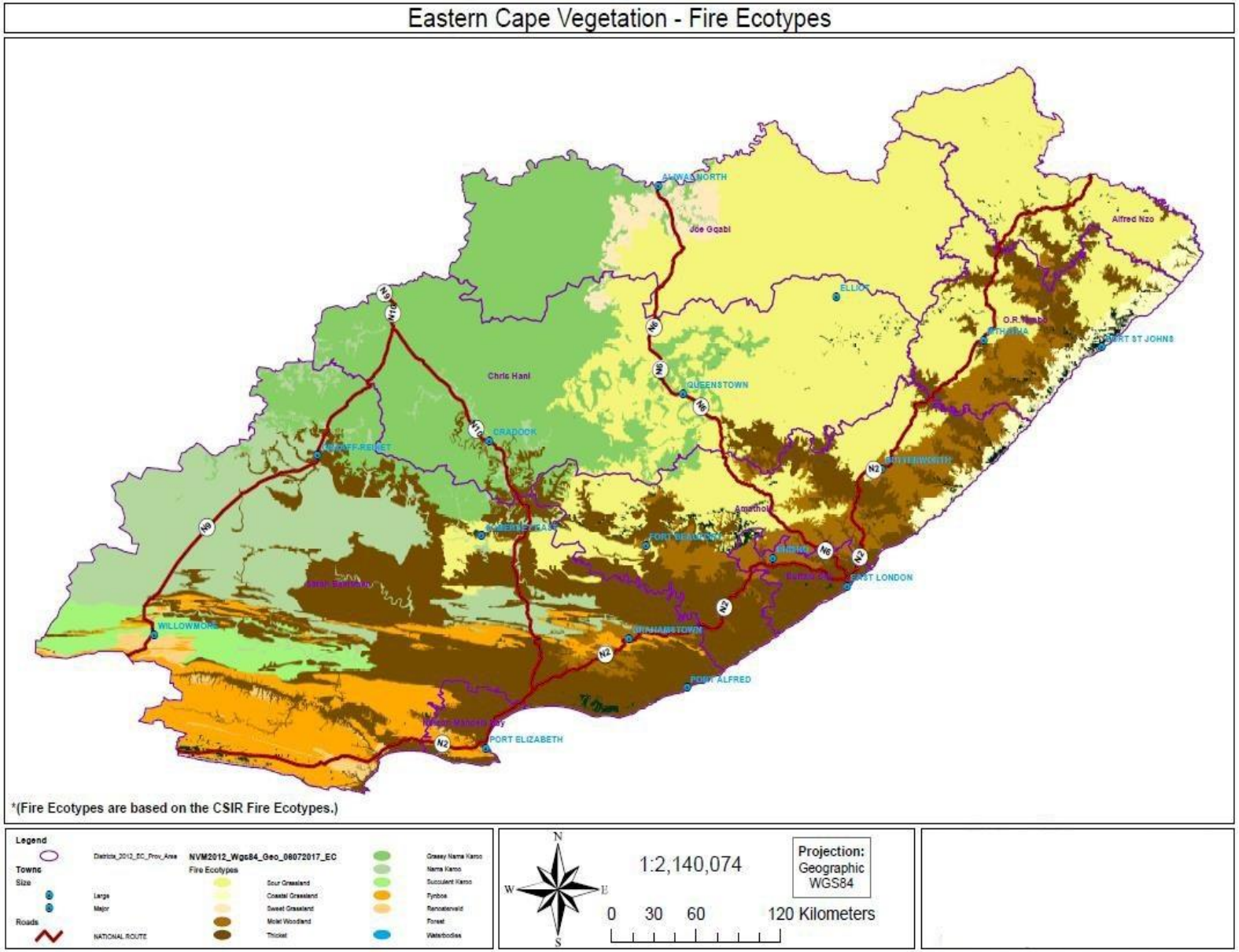


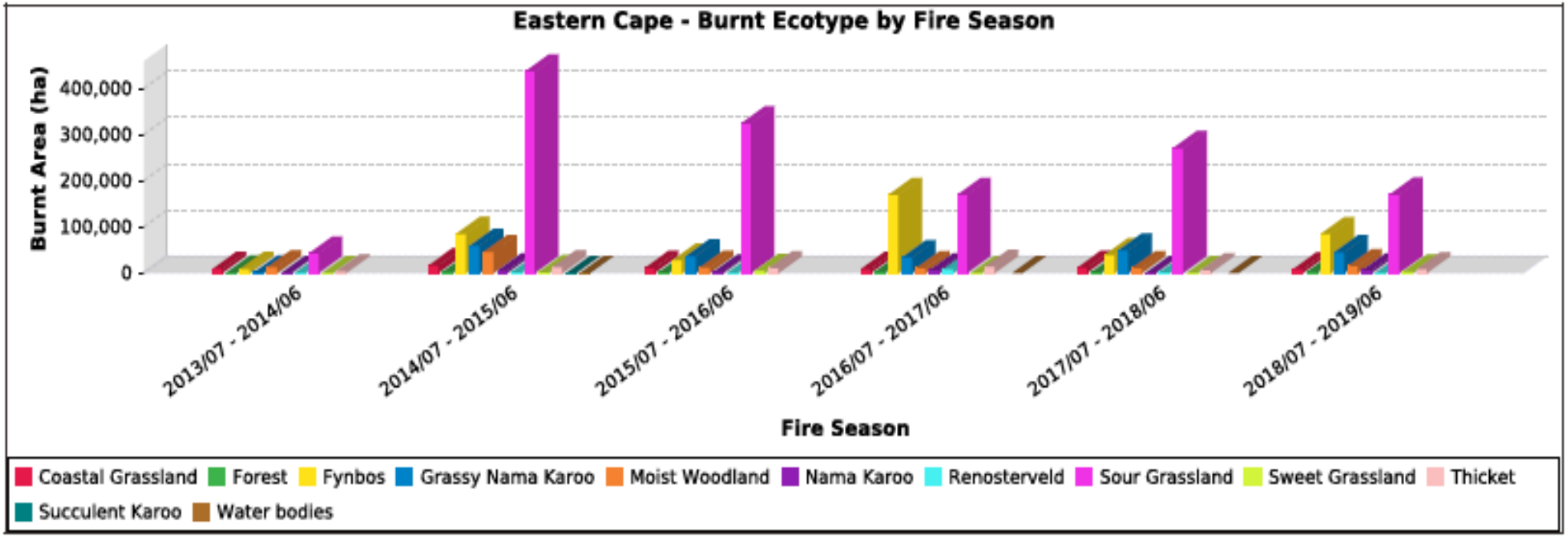
Figure 2-10: Eastern Cape Vegetation showing Fire Ecotypes

2.3.1 National Perspective

From the national statistics, there is a clear trend of wildfires that have occurred between the provinces and vegetation types. The data clearly indicates that the over the past 17 years the Eastern Cape, with a total area of 9 514 936 Ha, is the province with the third largest area that burnt, following KwaZulu-Natal and Mpumalanga (ECUFPA, 2017).

2.3.2 History of the Data

The CSIR's Meraka Institute has developed the AFIS System. This system makes use of various satellites, such as the TERRA and NPP satellites, to obtain live fire detection data. In addition to this, they are also able to draw off burn scar data, after a fire, making use of satellites, such as LANDSAT 8. Burn scar data, since 2001, has been used to develop the statistics used in the compilation of this report (AFIS, Meraka Institute, 2019)



Eastern Cape Burnt Statistics in hectares & Burnt Area >= 50000 (ha) are highlighted in red.

Eastern Cape	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ECOTYPE TOTALS
2013/07 - 2014/06	5,836.28	1,845.53	2,338.84	3,196.32	3,539.15	61,059.78	0.00	0.00	0.00	0.00	0.00	0.00	77,815.91
2014/07 - 2015/06	8,711.38	3,260.89	557.92	750.79	1,394.17	27,811.01	145,974.22	178,446.77	200,198.27	92,163.15	3,723.45	2,488.80	665,480.75
2015/07 - 2016/06	11,428.66	15,774.82	1,673.34	6,266.66	2,209.30	19,131.52	29,874.58	126,024.62	132,131.64	45,515.23	13,933.26	24,516.01	428,479.59
2016/07 - 2017/06	5,256.20	11,655.20	33,161.87	2,816.18	2,746.12	32,757.31	27,194.88	102,524.78	60,095.93	24,175.68	7,631.06	110,062.38	420,077.62
2017/07 - 2018/06	7,937.18	2,306.09	0.00	493.54	193.06	8,783.06	67,118.10	102,398.64	101,743.36	25,500.38	61,219.44	11,026.46	388,719.31
2018/07 - 2019/06	10,230.26	4,612.95	257.44	0.00	0.00	0.00	50,191.71	56,838.32	70,309.29	35,888.47	58,463.16	54,407.39	341,199.00
TOTALS	49,399.95	39,455.48	37,989.42	13,523.50	10,081.81	149,542.69	320,353.50	566,233.12	564,478.50	223,242.91	144,970.38	202,501.03	2,321,772.25

Figure 2-11: Eastern Cape – Burnt Ecotype by Fire Season over Last 5 Years

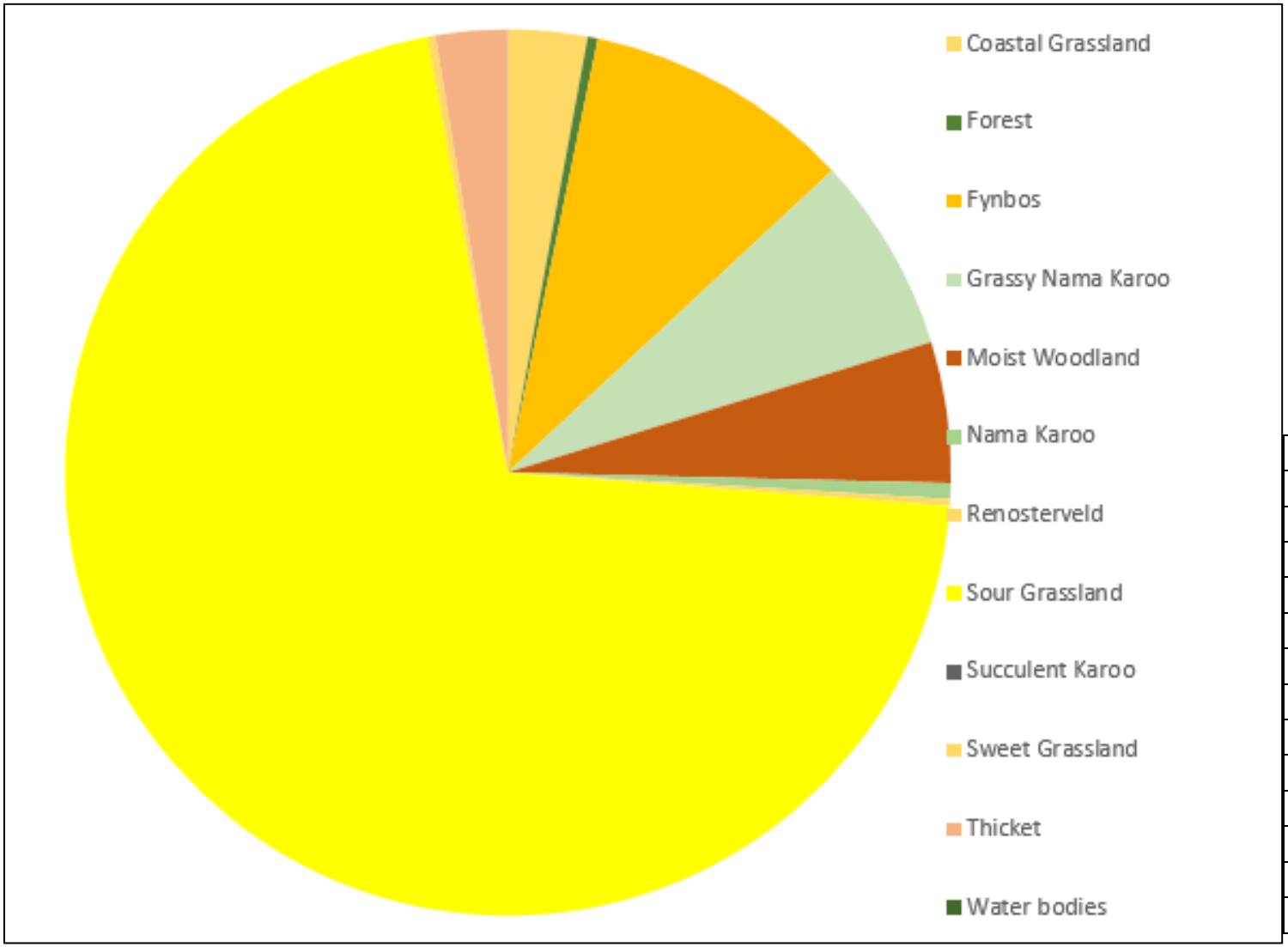
2.3.3 Eastern Cape Fire Regimes

Before analysing the data, we must acknowledge the Eastern Cape's veldfire regimes and vegetation types. Map 1 reflects the classification into the thirteen Fire Ecotypes classes as per the CSIR, National Veldfire Risk Assessment (Forsyth GG, 2010). The province can be divided into four predominant fire regions.

- Predominant Grassland area with Summer rainfall in the Northern part of the province. This area has a clear **winter fire season**. A fire prohibition period is normally in place from August until the end of October or until the first substantial Spring rains has occurred.
- Fynbos belt in the South Western portion of the province (portion of Sarah Baartman district) with an all year fire season.
- The arid inland areas with predominant Karoo types of vegetation tend to have a lower fire risk. These areas are susceptible to dry thunderstorms during the summer months that lead to fires in the inaccessible mountainous areas.
- The thicket areas rarely burn and is to a large extent a natural barrier between the Fynbos and Grassland vegetations.

The vastly different vegetation types and fire regimes make fire management even more challenging. This, combined with the fact that the Eastern Cape is the second largest province, necessitates the need for good fire management strategies by all of the District Municipalities who are responsible for dealing with wildfires.

If one looks at table 13, which indicates the areas burnt per vegetation type, it is clear that Sour Grassland contributes towards more than 70% of the total area burnt. It is therefore important that special consideration should be given to areas where this vegetation type is found.



Vegetation Type	Area Burnt (Ha)
Coastal Grassland	274 750.7
Forest	34 941.4
Fynbos	934 041.1
Grassy Nama Karoo	682 862.7
Moist Woodland	488 489.7
Nama Karoo	54 990.8
Renosterveld	22 738.6
Sour Grassland	6 745 560.0
Succulent Karoo	411.3
Sweet Grassland	26 532.0
Thicket	249 437.1
Water bodies	181.3
Grand Total	**9 514**

Figure 2-12: Areas burnt per different vegetation type

2.3.4 **Fire Cycle**

The total area burnt during the past seventeen years, as can be seen in Figure 2-12, shows a trend that can in some instances be related back to drought conditions. Smaller areas burnt during the last three years that can be attributed to drought conditions. We can therefore expect larger areas burning during the next year or two as rainfall improves.

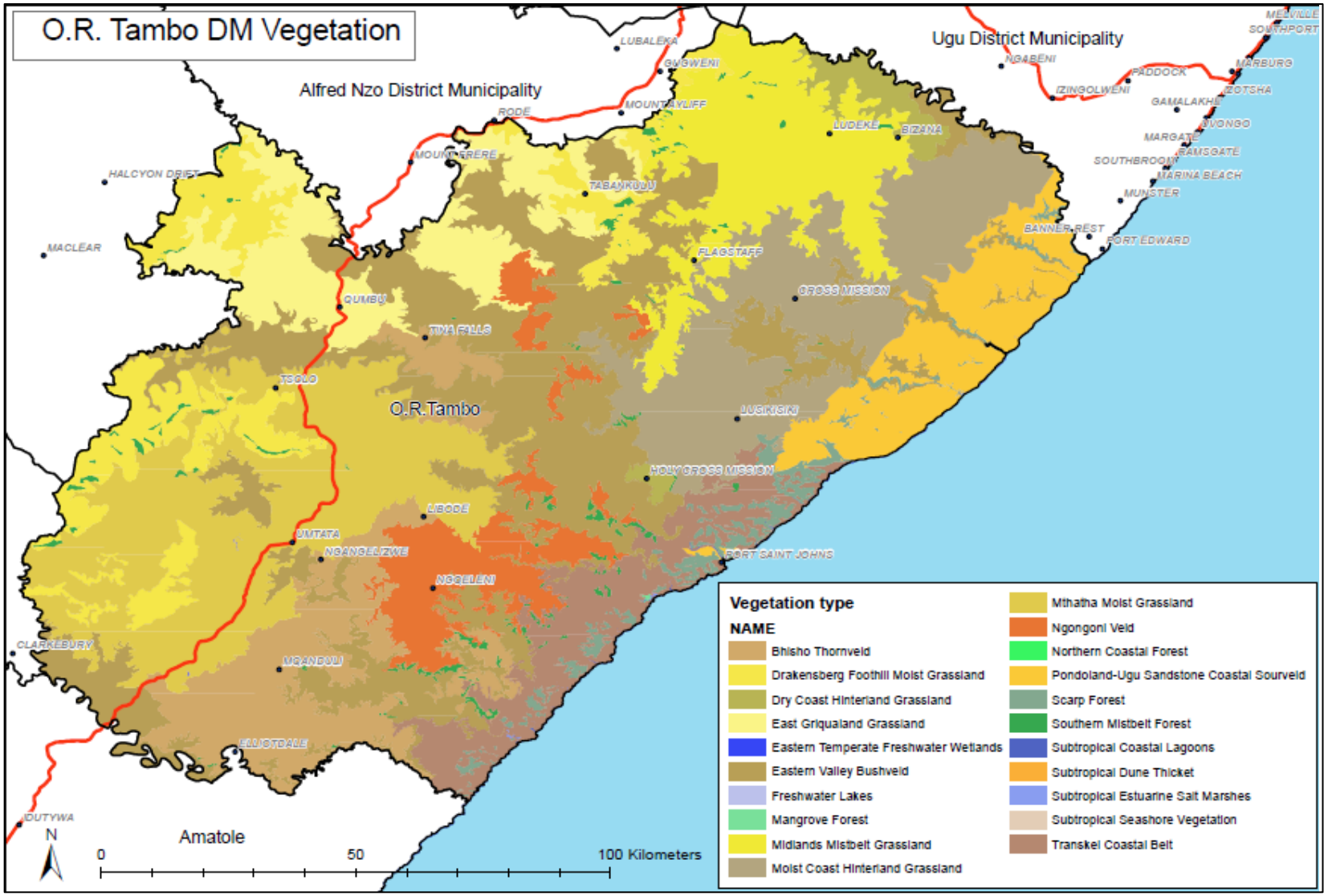


Figure 2-13: OR Tambo District Municipality Vegetation Types

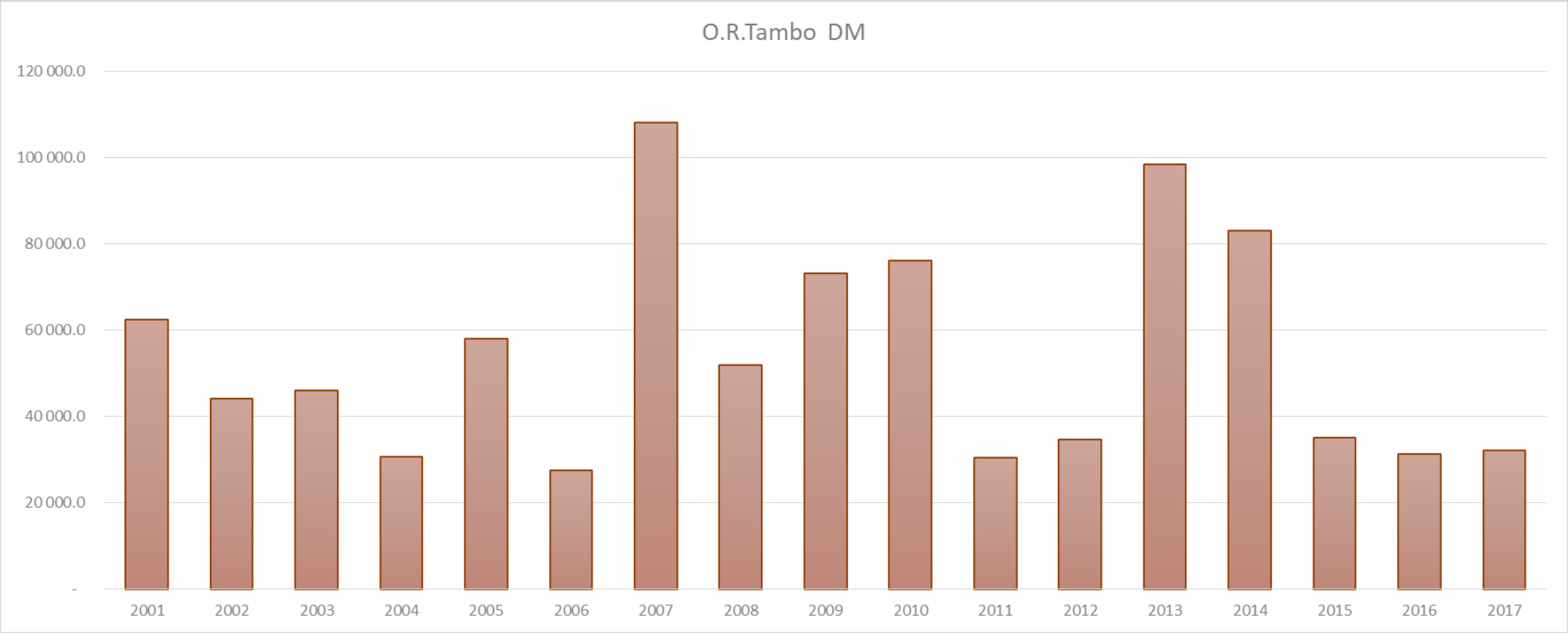
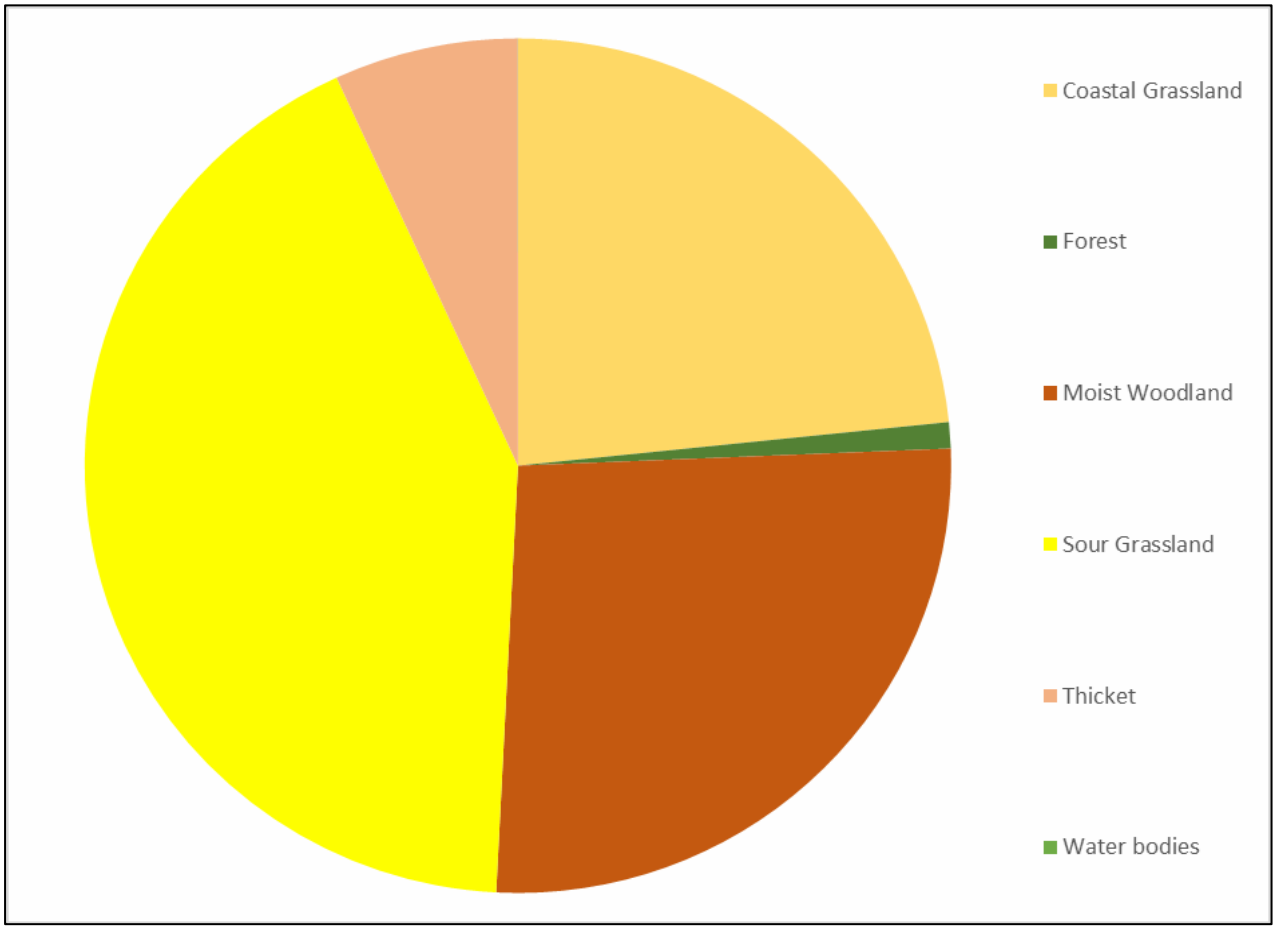


Figure 2-14: Total Burnt Area (in Hectares) for the O.R. Tambo District – 2001 to 2017



Vegetation Type	Area Burnt (Ha)
Coastal Grassland	215 537.1
Forest	9 126.3
Moist Woodland	243 838.3
Sour Grassland	390 329.5
Thicket	63 372.4
Water bodies	44.2
Grand Total	922 247.8

Figure 2-15: Total Areas burnt per vegetation type for O.R. Tambo District – 2001 to 2017

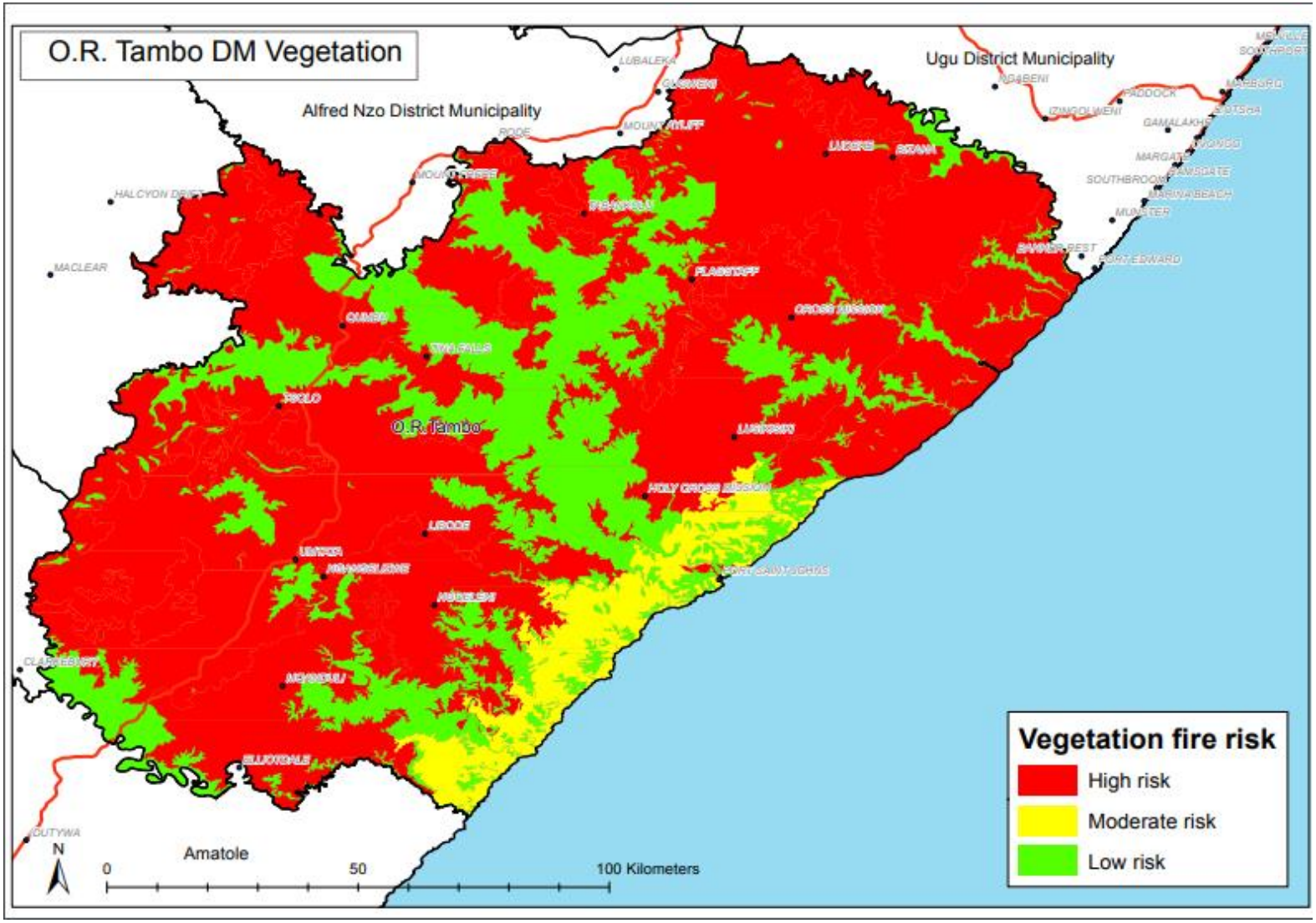


Figure 2-16: O R Tambo DM Vegetation Fire Risk

VegType	Biome	General	Grass	Trees	General2	Fire Risk
Bhisho Thornveld	Savana	Open savanna	Small med 7 e	Small	Woody spp with overgrazing	High
Drakensberg Foothill Moist Grassland	Grassland	Forb-rich grassland dominated by short bunch grasses	Short	Some forest spp		High
Dry Coast Hinterland Grassland	Grassland					High
East Griqualand Grassland	Grassland	Grassland in places, with patches of bush clumps	Some	Bush clumps		High
Eastern Temperate Freshwater Wetlands						Very little
Eastern Valley Bushveld	Savanna	Woodlands in a mosaic with thickets, often succulent	Little	Some forest spp		Little
Freshwater Lakes						None
Mangrove Forest	Forest					None
Midlands Mistbelt Grassland	Grassland		Tall			High
Moist Coast Hinterland Grassland						High
Mthatha Moist Grassland	Grassland		Wiry			High
Ngongoni Veld	Grassland	Dense, tall grassland mostly unpalatable	Dense, tall	Wooded areas		High
Northern Coastal Forest	Forest					Very little
Pondoland-Ugu Sandstone Coastal Sourveld	Grassland	Grassland with scattered low shrubs/small trees	Little	Shrubs		High
Scarp Forest	Forest					Little
Southern Mistbelt Forest	Forest					Little
Subtropical Coastal Lagoons	Lagoons					None
Subtropical Dune Thicket	Thicket					Very little
Subtropical Estuarine Salt Marshes	Salt Marshes					None
Subtropical Seashore Vegetation	Seashore					Medium
Transkei Coastal Belt		Mosaic of grassland and bush clumps	Some	Some forest spp		Medium

Table 2-10: Description of Vegetation Type with associated Fire Risk

Row Labels	Azonal Vegetation	Forests	Grassland	Indian Ocean Coastal Belt	Savanna	Waterbodies	Grand Total
Bhisho Thornveld					128726,3		128726,3
Drakensberg Foothill Moist Grassland			118081,9				118081,9
Dry Coast Hinterland Grassland			24045,5				24045,5
East Griqualand Grassland			107023,4				107023,4
Eastern Temperate Freshwater Wetlands	132,6						132,6
Eastern Valley Bushveld					354555,4		354555,4
Freshwater Lakes						0,2	0,2
Mangrove Forest		169,8					169,8
Midlands Mistbelt Grassland			135231,0				135231,0
Moist Coast Hinterland Grassland			186895,4				186895,4
Mthatha Moist Grassland			235248,1				235248,1
Ngongoni Veld					80396,0		80396,0
Northern Coastal Forest		57,4					57,4
Pondoland-Ugu Sandstone Coastal Sourveld				91666,4			91666,4
Scarp Forest		27969,6					27969,6
Southern Mistbelt Forest		16862,1					16862,1
Subtropical Coastal Lagoons						819,3	819,3
Subtropical Dune Thicket	33,7						33,7
Subtropical Estuarine Salt Marshes	190,0						190,0
Subtropical Seashore Vegetation	215,9						215,9
Transkei Coastal Belt				86336,1			86336,1
Grand Total	**572,1**	**45058,9**	**806525,3**	**178002,5**	**563677,7**	**819,5**	**1594656,0**

Table 2-11: Vegetation Types per Hectare of Three Main Vegetation Fire Risk Types

2.3.5 Proposed Strategies to Address the Wildfire Risk

We recommend that the following findings based on the fire risk assessment described above could form the kernel of the strategies recommended to mitigate the risk:

The increase in scale and frequency of wildfires is creating incident command and control difficulties and often results in loss of life. Issues that have to be addressed should include the following:

- Shorten fire team activation time through improved fire detection and alerting. Use must be made of social media to post the Fire Control Room's telephone number in as many strategic places as possible. The public can aid to report any ignition as soon as it starts. The use of social media has made an impact on the reporting of incidents.
- Improve response times to fires by considering number and location of fire suppression resources. During the fire season all personnel and vehicles have to be on high alert to be ready to respond to any wildfire emergency call. In the wet season resources can be redeployed to be available at other strategic points for any other disasters that may occur, such as flash floods.
- The highest number of incidents of wildfires are between June to December with more than 93% occurrence during this period, burning more than 2,1 million hectares in the last five years alone (AFIS, Meraka Institute 2019).
- A firebreak is a barrier (constructed or natural) that is reasonably clear of flammable material and is used to stop a fire or serve as a control line from where to fight a fire. The National Veld and Forest Fire Act (Department of Water Affairs and Forestry, 1998) states the following requirements for a firebreak:
    a. It should be wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land.
    b. It should not cause soil erosion
    c. It should be reasonably free of flammable material to prevent a veld fire from burning across the fire break
- Consider changes to wildfire prevention with specific reference to fire breaks and fire barriers. Identify strategic firebreaks in the landscape. This is in line with an Application for Exemption, to the Minister, of constructing firebreaks that are not on the real property boundary. Use can be made of natural features like rivers, cliffs, dams or barriers such as roads or deep valleys.

- Types of firebreaks:
    a. Burning of tracer lines and firebreaks are common practice
    b. Mowing of strips of land late in the growing season
    c. Mechanical removal by using graders or disc ploughs
    d. Chemical removal of flammable material with registered herbicides
- One of the most effective firebreaks that can be made in rural communities are a tractor prepared disc fire break around any vulnerable infrastructure i.e. schools, clinics, hospitals, police stations, shopping complexes and even around smaller villages. If the vegetation is short or regularly grazed a double width of 2,4 meter i.e. 4,8meter and for longer grass and higher vegetation 4 swaths of 2,4 meter i.e. 9,6 m should provide an effective break.
- Improved resource coordination through incident command procedures. All fire personnel have to be trained in Intermediary and Advanced Incident Command programs (ICS).
- Be ready for firefighting activities as per the Eastern Cape Umbrella FPA recommendations and agreements that applies to all members of the FPA:
    a. Take action to prevent and extinguish veld fires on their property
    b. Have trained personnel with protective clothing available
    c. Have firefighting equipment available
    d. Notify the local FPA of a fire on their property
    e. Ensure that responsible persons are present when the landowner is absent
- Improved wildfire fighting through training and simulation. The ECUFPA in Stutterheim can assist with any request for additional training for preparedness and to combat wildfires.
- The distribution of sweet- and sourveld in relation to climate, parent material and soil nutrients has been looked at in the Eastern Cape's grassland biome. Sourveld occurs in areas with high water supply and where parent material gives rise to soils with a low base status. Sweetveld occurs in areas with low water supply and where parent material gives rise to soils with a high base status. Sourveld occurs where carbon uptake is high relative to nutrient supply, and sweetveld where nutrient supply is high relative to carbon uptake. Mixed veld is intermediate between these two. That explains the sweetveld closer to the coast or lowlands and the sourveld at the higher altitudes. The grazing regimes will determine the fuel loads that will affect the fire spread behaviour.

- The fire danger index (FDI) with the different levels of danger rating:

Lowveld FDI Description	Colour	Category	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 crating 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 are to be placed on full stand-by. At first sign of smoke, every possible measure sjoud be taken in order to bring the fire under control in the shortest possible time. all available aircraft are to be called for without delay.

Table 2-12: Fire Danger Rating Index

The above fire danger index has to be displayed and explained to all responders and the information shared with the public as to the levels of awareness. Specific signage can be sourced through the ECUFPA.

3. Response Times

The recommended response times for fire appliances in terms of SANS 10090 is as follows:

Risk Category	Maximum Call Receipt and Turn-out Time min	Maximum Appliance Travel Time min	Maximum Attendance Time min
A	3	5	8
B	3	7	10
C	3	10	13
D	3	20	23

Table 3-1: Response Times Matrix

These response times were used as a guide when selecting the placement of fire stations.

4. Current Resources

Based on the onsite survey and telephonic discussions with fire officers in the region the status of the current fire service establishment within the ORTDM judicial area is summarised as follows:

OR TAMBO DM FIRE SERVICES								
							Personnel	
		Fire Station	Cruiser 4x4	Pumps	Rescue Vehicle	Water Tanker	Professional	Reservist
ORTDM	**Mthatha**						5	0
Ingquza Hill	**Lusikisiki**	Depot	1	1	1	0	6	21
	Flagstaff	No	0	0	0	0	0	0
KSD	**Mqanduli**	No	0	0	0	0	0	0
	Mthatha	Yes	2	1	1	1	39	0
Mhlontlo	**Qumbu**	Depot	0	1	0	1	5	18
	Tsolo	No	0	0	0	0	0	0
Nyandeni	**Libode**	Under Construction	1	1	0	0	8	28
	Ngqeleni	No	0	0	0	0	0	0
PSJ	**PSJ**	No	1	0	1	0	6	18

Table 4-1: Current Operational Fire Fighting Resources

The FDD consultants have assessed the fire and rescue risks within the ORTDM vis a vis the current resources.

4.1 Operational Services

4.1.1 Incident Command

An effective incident command system ensures that fire fighting resources are efficiently deployed, fire losses are minimised, and fire fighter safety is ensured. There is no evidence that incident command is being formally implemented.

It will be recommended that all officers receive incident command training and that an incident command vehicle be located in Mthatha for large fire and disaster management incidents.

4.1.2 Structural Fire Fighting

Structural fire fighting is not being provided at a standard that matches the fire risks found within ORTDM. Mthatha and Port St Johns have the best resourced fire stations. The fire fighting vehicles are however old, and many need significant maintenance.

It will be recommended that fire fighting vehicles, equipment and personnel be strategically located throughout the ORTDM to respond timeously to such incidents. The existing fleet of vehicles must be modernized.

4.1.3 **Veldfires**

Veldfires are a significant hazard and many such fires occur annually. Within South Africa more peoples are killed annually as a result of veldfires than structural fires. The economic impact of veldfires may be less than structural fires, but from a life safety perspective they cannot be ignored.

It will be recommended that 4x4 firefighting vehicles and water tankers, with personnel be strategically located throughout the ORTDM to respond timeously to such incidents.

4.1.4 **Hazardous Chemical Incidents**

The fire brigades within ORTDM are under resourced to deal with hazardous materials incidents. Such incidents do not often occur but when they do occur, they can have a significant impact on the economy and the environment.

It will be recommended that all fire fighting vehicles have a basic capacity to deal with hazardous materials incidents and that a hazardous materials vehicle (possibly a trailer) be strategically located in Mthatha, with additional equipment on the 4x4 fire vehicles stationed in Libode, Qumbu and Port St Johns.

4.1.5 **Motor Vehicle and Other Rescue**

The response of the fire brigades within ORTDM to motor vehicle accidents is inadequate. The N2 and R61 carry large volumes of traffic and there are a number of hazards to traffic that can lead to accidents, including, mist and rain, stray animals, and pedestrians.

It will be recommended that rescue vehicles, equipment and personnel be strategically located throughout the ORTDM to respond timeously to such incidents.

4.2 **Support Services**

4.2.1 **Fire Safety**

Fire safety inspections and plan approval do not currently address the objectives and requirements of the National Building Regulations. It will be proposed that this function be significantly strengthened. Fire plan approval has a long term impact on fire safety in a community.

4.2.2 **Fire Education**

There is currently no planned public fire safety education taking place within ORTDM. By strengthening this function, a long term investment can be made in community fire safety.

It will be recommended that a fire safety educator be based in Mthatha and offer public education training in high risk populations, such as schools, hospitals and old age homes

4.2.3 **Fire Fighter Training**

The current arrangement for fire fighter and officer training is inadequate. Fire fighters must be subject to an ongoing training regime to maintain skills and learn new techniques.

It will be recommended that the training capacity in Mthatha be strengthened and that fire personnel throughout ORTDM rotate through this central facility.

4.2.4 **Call Taking**

The emergency call taking function is based in the ORTDM offices in Mthatha. The City of Mthatha also has its own emergency call taking facility.

It will be recommended that all emergency calls, including disaster management, within ORTDM be routed to a single facility.

5. Fire Safety

Fire safety is one of the core service delivery functions of a fire service. It is an activity that has the potential to make an important contribution to the community over many decades. It is also the most cost-effective means to lower the total cost of fire on a community.

To quote from SANS 10090, "*Fire prevention is an important feature of the fire service and it has been proved that in brigades where this division of the service is efficiently organized fire losses have been reduced by more than 20 %. The purpose of fire prevention measures is to prevent, eliminate, or reduce hazards that contribute to the occurrence and spread of fire"*.

The functions of a fire safety division are as follows:

5.1 Fire Safety Inspections and Code Enforcement

This SANS 10090 requirement is stated as follows: "Authorities should conduct fire safety inspections in response to complaints or requests or both to assist owners, occupiers, and developers and to satisfy local requirements for scheduled routine inspection of all occupancies other than dwellings as given in by-laws or other applicable legislation".

The fire inspectors must be suitably trained and have the knowledge and skills to conduct fire safety audits and correctly interpret the National Building Regulations, SANS codes related to flammable liquids and gasses, and the municipal bylaws.

Fire inspectors must regulate the storage, transportation, processing, sale and handling of flammable liquids and gases and other dangerous goods that could lead to the existence of dangerous conditions that could affect life safety or property loss, or both.

5.2 Reviewing of Building Plans

An important function of the fire safety division is to review building plans and make recommendations related to fire safety to the Building Control Officer. It will be recommended that building plans be handed in at a central location at the ORTDM and scrutinised by a committee consisting of the senior fire safety officer and a regional officer based at a fire station in the local municipality. This will ensure that local circumstances are considered when making building plan recommendations and that local fire officers are aware of development in their area of response.

5.3 **Pre-Incident Planning**

It has been shown that a system of pre-incident (pre-fire) plans have a significant impact on the outcome of a fire. If a fire crew has access to a pre-incident plan when responding to an emergency, the financial losses at the burning building can be reduced by 40%.

A formal pre-incident plan should be available for key special risks and other premises as deemed necessary by fire brigade management. Accurate records should be kept of the latest revisions and details of emergency exercises involving the brigade

An example of a pre-incident plan is shown below using a QF™ Code. The reader can activate the code by using a QR reader on a smart phone (a typical app is “QR Reader”)

Figure 5-1: QF™ Code 1: Example of Pre-Incident Plan

5.4 **Fire Safety Bylaws**

The promulgation of fire safety bylaws empowers the fire brigade service to address fire protection issues within a community not covered by the national building regulations. These are typically for the storage and handling of flammable liquids and gasses.

It is generally recognised that fire safety bylaws should be consistent throughout a district municipality. It is difficult for businesses to comply with bylaws if they differ from one local municipality to another.

KSDLM has promulgated a Community Safety Bylaw which is modelled on the standard used in the Western Cape Province. The ORTDM has already prepared draft fire safety bylaws. These bylaws have not yet been promulgated by the ORTDM. Having studied both sets of documents, the Consultants are of the opinion, that the draft ORTDM fire safety bylaws are more suited for use within the judicial area of the ORTDM. The following recommendations are made:

- That the draft ORTDM fire safety bylaws be reviewed and updated;
- That the KSD fire safety bylaws be withdrawn;
- That the proposed ORTDM fire safety bylaws be promulgated for use throughout the ORTDM judicial area.

5.5 **Fire Safety Personnel**

Fire safety must be seen as an equal priority with operational fire fighting. This division of the fire service must be adequately resourced and seen as an investment in the long-term fire safety of a community.

It is recommended that a fire safety officer with the rank of station commander be appointed in each of the following towns:

- Lusikisiki
- Mthatha
- Qumbu
- Libode
- PSJ

The five fire safety commanders will report to the Assistant Chief Fire officer based in Mthatha.

Each of the fire safety commanders must be allocated official transport.

5.6 **Smart City/Smart Village**

All fire safety planning must be made after considering whether efficiency improvements can be made by considering Smart City/Smart Village initiatives.

These will include extensive use of GIS, custom apps, and QF codes for pre-fire plans. By applying suitable technology to fire safety problems, the ORTDM can provide a world class service to the community at an affordable cost.

6. Call Taking

Efficient call taking is essential if fire service response standards are to be met. According to SANS 10090, the maximum time it must take to receive a call, find the nearest crew, and respond (turn out) to an incident is three (3) minutes. To achieve a three minute call receipt and turn-out time there can be no inefficiencies in the call taking and dispatch system.

Call taking personnel must be disciplined, well trained and have adequate supervision. The call centre must have the correct technology to take calls, find the nearest crew, and alert them and provide an address and routing.

It is recommended that all emergency and disaster call-taking, that includes fires, motor vehicle accidents, hazardous materials incidents, veldfires, flooding, landslides, that originate within the ORTDM, be routed to a single, well resourced, call taking centre.

7. Proposed Structure

The proposed structure for the ORTDM Fire and Emergency Service is based on a regional fire protection model so that an efficient and cost-effective service can be rendered to the community.

In accordance with the Fire Brigade Services Act (Department of Cooperative Governance and Traditional Affairs, 1987), the ORTDM must appoint a Chief Fire Officer who has the necessary qualifications and experience to command the fire and rescue service. The Chief Fire Officer will be assisted by an Assistant Chief Officer who will deputise is his/her absence.

The service will have three divisions, each headed by a Divisional officer, based in Mthatha:

- Operations
- Fire Safety
- Training

7.1 Operations Division

The operations division will be commanded by a Divisional Commander who reports to the Assistance Chief Fire Officer.

The Consultants have analysed the risk to the community from structural fires, wildfires, hazardous materials incidents and road traffic accidents and propose that fire stations be located in the following towns:

- Mthatha Headquarters Fire Station
- Flagstaff Satellite Fire Station
- Libode Satellite Fire Station
- Lusikisiki Regional Fire Station
- Qumbu Regional Fire Station
- Port St Johns Regional Fire Station
- Tsolo Satellite Fire Station

In future development of the fire service, and subject to a new risk review, satellite fire stations can be placed at Mqanduli and Ngqeleni. Currently the level of risk and the number of incidents do not justify the placement of fire fighting resources in these two towns but we show the impact of such placement for future planning.

7.1.1 Fire Station Classification

The consultants envisage three types of fire stations each with different facilities:

7.1.1.1 Headquarters Fire Station

- Under roof parking for seven fire appliances
- Offices for administrative staff
- Storerooms (uniforms, hazmat equipment, spares)
- Workshop Breathing Apparatus
- Workshop Equipment
- Workshop Vehicles
- Underground Fuel Tank with Dispensing Bowser
- Lecture Room (one large, one small)
- Mess Room
- Ablutions (toilets, showers)
- Watchroom
- Parade Ground and Drill Yard
- Hose Drying Tower
- Breathing Apparatus Compressor with Cascade Tanks
- Bulk Foam Stock

7.1.1.2 Regional Fire Station

- Under roof parking for three fire appliances
- Administrative Office
- Storeroom
- Underground Fuel Tank with Dispensing Bowser
- Lecture Room (small)
- Mess Room
- Ablutions (toilets, showers)
- Watchroom
- Parade Ground and Drill Yard
- Hose Drying Tower/Equipment
- Portable breathing apparatus compressor

7.1.1.3 Satellite Fire Station

- Under roof parking for two fire appliances
- Administrative Office
- Storeroom
- Lecture Room
- Mess Room
- Ablutions (toilets, showers)

7.1.2 Emergency Service Vehicles

Based on the fire risk assessment, the travel distance to risk areas, and distance between towns the following fire and rescue services fleet is recommended:

Municipality	Pump Medium	Pump 4x4	Water Tanker	Rescue & Hazmat	Aerial Platform	Incident Command
Mthatha	2	1	1	1	1	1
Flagstaff	0	1	1	0	0	0
Libode	0	1	1	1	0	0
Lusikisiki	1	1	1	0	0	0
Qumbu	1	1	1	1	0	0
Port St Johns	1	1	1	0	0	0
Tsolo	0	1	1	1	0	0
Total	**5**	**7**	**7**	**4**	**1**	**1**

Table 7-1: Recommended Emergency Vehicle Fleet

For future planning the following vehicle establishment at Mqanduli and Ngqeleni is recommended:

Municipality	Pump Medium	Pump 4x4	Water Tanker	Rescue & Hazmat	Aerial Platform	Incident Command
Mqanduli	0	1	1	0	0	0
Ngqeleni	0	1	1	0	0	0

7.1.3 Personnel

The determination of the operational personnel is based on the following methodology:

- There are four operational shifts to be covered
- Each medium pump is crewed by three fire fighters and one officer
- Each 4x4 fire pump is crewed by two firefighters
- Each water tanker is crewed by two fire fighters
- A minimum response to a small incident or wildfire is one officer/leading firefighter AND a 4x4 fire pump AND a water tanker. This ensures that there is a person to take command and sufficient personnel for firefighting evolutions
- A Rescue/Hazmat vehicle is crewed by two firefighters
- An aerial platform is crewed by two firefighters
- It is assumed that the aerial platform and rescue vehicle do not respond simultaneously
- Allowance is made for 12% of firefighters to be on sick or annual leave or training

The operational establishment is therefore as follows:

Station	Firefighters	Leading Firefighters	Station Officer
Mthatha	60	4	4
Flagstaff	18	4	0
Libode	28	4	0
Lusikisiki	28	4	4
Qumbu	36	4	4
Port St Johns	36	4	4
Tsolo	18	4	0
Total	224	28	16

Table 7-2: Personnel Establishment – Officers and Fire Fighters

An administrative officer can assist the divisional officer with administration.

For future planning the following operational establishment at Mqanduli and Ngqeleni is recommended

Station	Firefighters	Leading Firefighters	Station Officer
Mqanduli	18	4	0
Ngqeleni	18	4	0

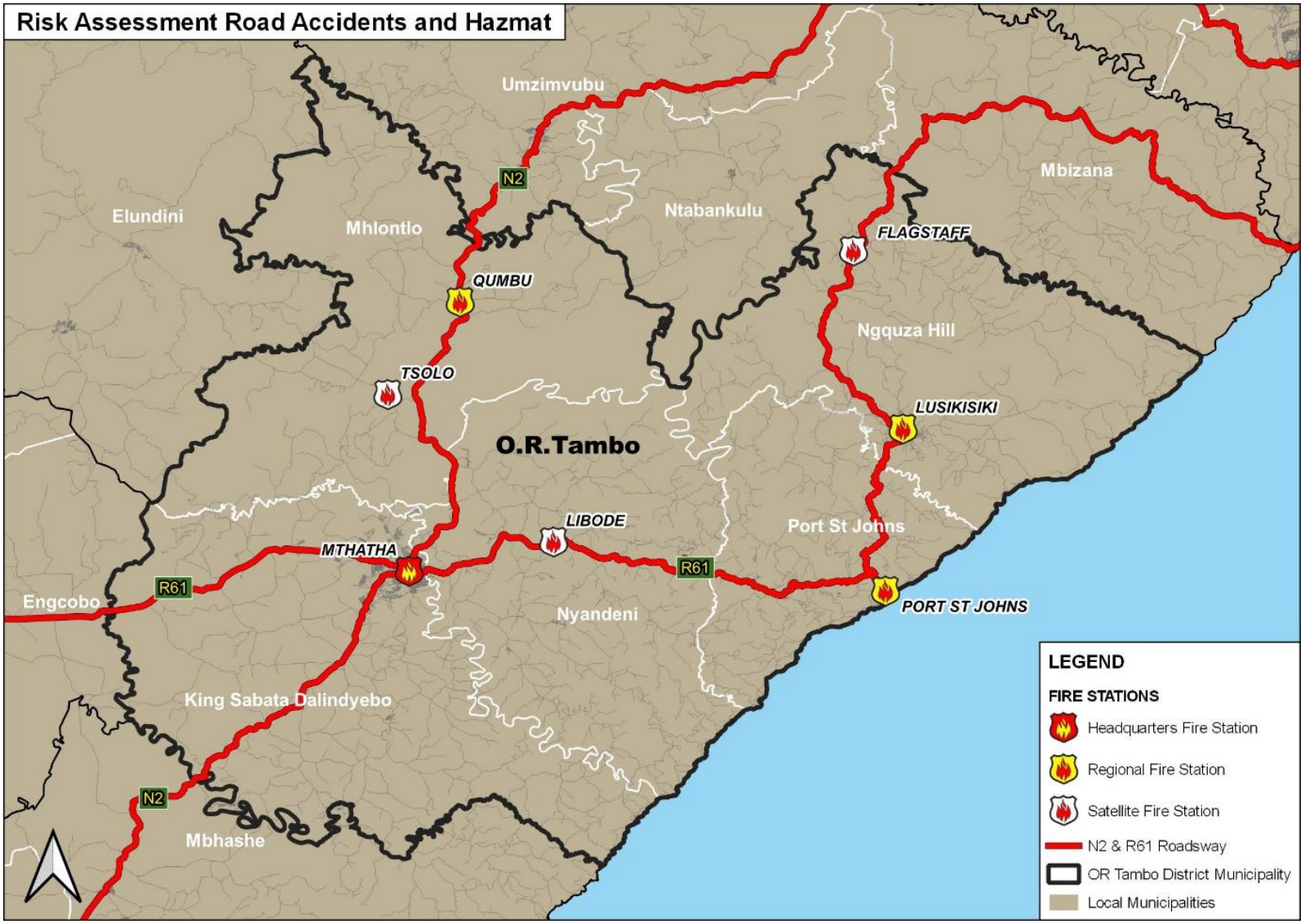


Figure 7-1: Distribution of Fire Stations

7.2 Fire Safety

The Fire Safety Division will be commanded by a divisional officer stationed in Mthatha. The incumbent will be assisted by five station officers who will be located in the following fire stations:

- Lusikisiki
- Mthatha
- Qumbu
- Libode
- Port St Johns

An administrative officer can assist the divisional officer with administration.

7.3 Training

The Training Division will be commanded by a divisional officer stationed in Mthatha. The incumbent will be assisted by a station officer and a public fire safety educator. The station officer will be responsible for training of operational fire personnel and the public educator will develop and present programs to the public.

An administrative officer can assist the divisional officer with administration.

7.3.1 Recommended Minimum Training Courses

All firefighters must be certified in the following four courses:

- Fire fighter 1
- Fire fighter 2
- Hazmat First Responder
- Basic Life Support
- Basic Incident Command

Courses that should be presented to career fire personnel (where appropriate) should include the following:

- Hazmat Technician
- Fire Inspector
- Pump Operator
- Fire Officer
- Wildland Fires
- Fire Origin and Cause Investigation

7.3.2 Training Centre Mthatha

The most cost effective strategy for the ongoing training of firefighters and officers within the ORTDM is to establish a central training facility. Such a facility can be developed to ensure that environmental impact from training fires is minimised, wastewater is treated and recycled and fire fighter safety is assured.

The ORTDM must identify a suitable site for such a training centre where fires can be created for training purposes. Training at the station level within towns can be in the form of daily drills and lectures without making fires.

7.3.3 Public Educator

Public fire safety education forms a central theme of this report. A public fire safety education program can play a positive long term role in reducing death and injury due to fire and minimise economic loss. Public fire education has a significant impact on service delivery and can cover the needs of pre-schoolers, pupils and risk groups such as the elderly and hospitals.

8. Wildfires

Wildfires are prevalent within the ORTDM and the risk assessment has determined the areas of greatest concern. The fire stations in these areas will be equipped with a combination of a 4x4 fire fighting vehicles and 4x4 water tankers.

Each of the 4x4 emergency vehicles will be manned by a crew of two persons. One station officer or leading firefighter will respond to an incident with an LDV. This implies that at all wildfire incidents there will be an officer/leading firefighter to take command and implement incident command and a crew of four fire fighters. Additional resources can be summoned from other fire stations as circumstances demand.

8.1 General Vehicle Specifications

The general specification for the two classes of vehicles for use at wildfires is as follows:

8.1.1 4x4 Fire Fighting Vehicle

The vehicle can be based on a Toyota Landcruiser, or equivalent.

- Water Tank, 500 litre capacity
- Portable fire pump with high pressure capacity
- Fire hose, branch
- Suction hose
- Breathing apparatus
- Lightbar and siren

8.1.2 4x4 Water Tanker

The general specification can be based on an Iveco 4x4, or equivalent

- Water Tank, 5000 litres
- Portable fire pump with high pressure capacity
- Fire hose, branch
- Suction hose
- Foam Concentrate
- Lightbar and Siren

8.2 Wildland Urban Interface

The spread of fires from the veld to urban areas is a risk that must be controlled by the fire service. With changes in climate the spread of fire across the urban-wildland interface is a significant cause of injury and death, and economic loss.

The ORTDM fire and rescue service will have to implement a program to identify these wildland-urban interfaces that are at risk and control them by means of the fire safety bylaws. If the goals of the Smart Village program are considered, these surveys can be done annually in the appropriate season using remotely controlled drones and artificial intelligence software.

8.3 FPA's

The Veld and Forest Act creates a legal entity known as a Fire Protection Association. The FPA's within the ORTDM fall under the Eastern Cape Umbrella FPA. Currently only the FPA at Tsolo is active. The establishment of FPA's within the ORTDM should be seen as a matter of priority as these structures actively contribute towards the aims and objectives of the Veld and Forest Fire Act.

9. Mutual Aid Agreements

A fire service establishment is developed to cater for the majority of incidents that can occur within its area of jurisdiction. There will however be exceptional incidents from time-to-time that require additional resources. To deal with such eventualities without having to declare a state of disaster, fire services conclude mutual aid agreements.

It is recommended that mutual aid agreements be concluded between ORTDM and the neighbouring DM's and the Mthatha Airport.

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