Brief overview of fires in the Eastern Cape 2001 – 2017

Based on information from AFIS (Advanced Fire Information system)
CSIR – Meraka Institute

DATE: November 2017

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Introduction:

Fire history data received from AFIS (Advanced Fire Information system), which is a system managed by the Meraka Institute of the CSIR, lead to compilation of this report.

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 the LANDSAT 8.

Burn scar data, since 2001, has been used to develop the statistics used in the compilation of this report. Acknowledgement and thanks must go to the CSIR Meraka Institute for these statistics and the work they have done on the AFIS system.

The current data reflects the total area burnt per month and ecotype and it is categorised per local municipal area. This gave us the opportunity to start looking at trends between areas, time of year and vegetation types. For the purpose of this report, we will start off by making broad comparisons. We will concentrate on the Eastern Cape data, but include a brief overview of the national statistics.

It is important to consider that the satellites could not distinguish between controlled burns and wildfires. This can only be done, in a certain sense, by looking at time of burn.

We will largely make use of tables and graphic displays to demonstrate the trends.

National Perspective:

From the national statistics, we can see the trend or difference between provinces and vegetation types as shown in Table 1. This clearly indicates that the over the past 17 years the Eastern Cape, with a total area of 9 412 538 Ha, is the province with the third largest area that burnt, following KwaZulu-Natal and Mpumalanga.

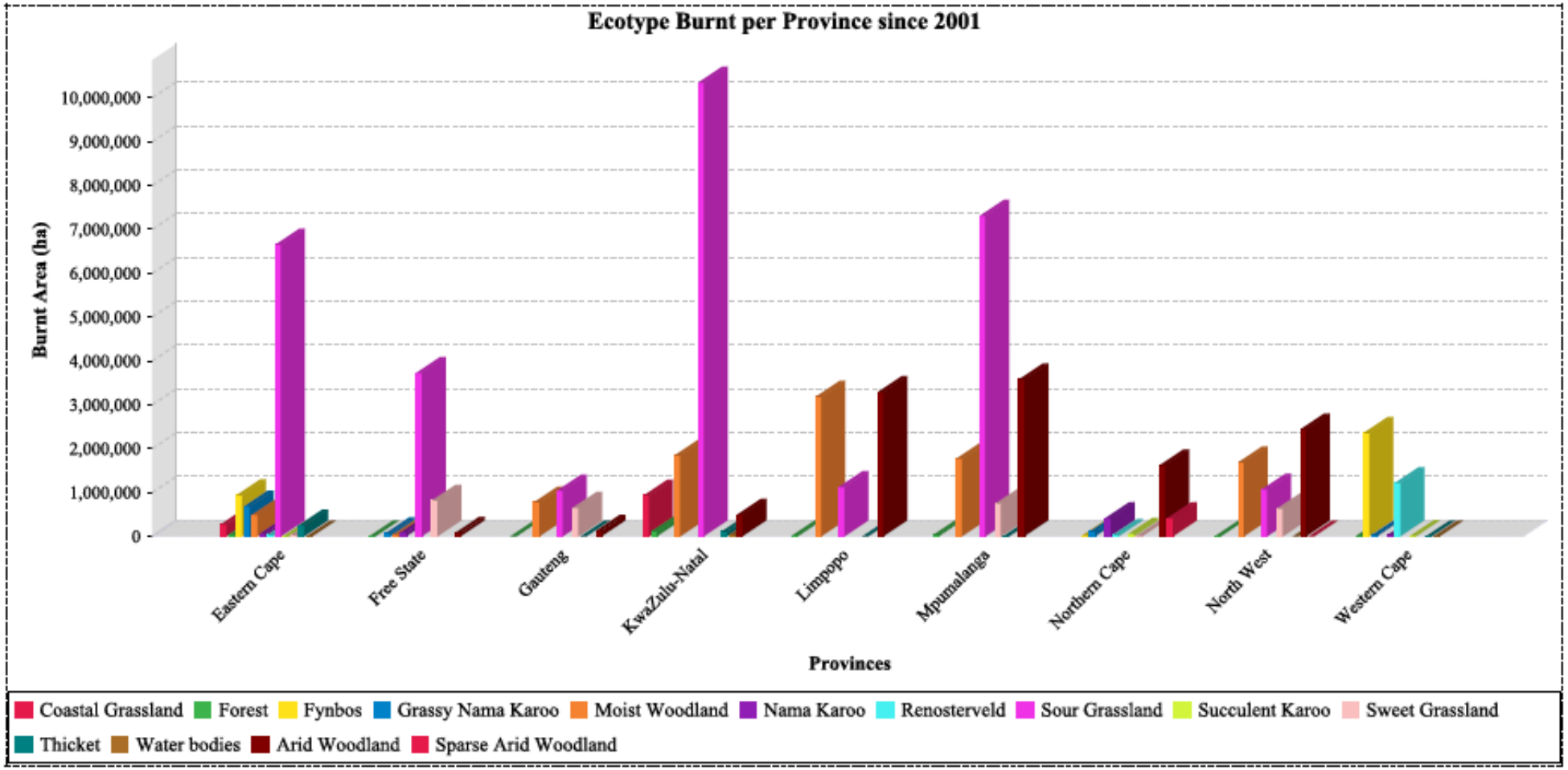
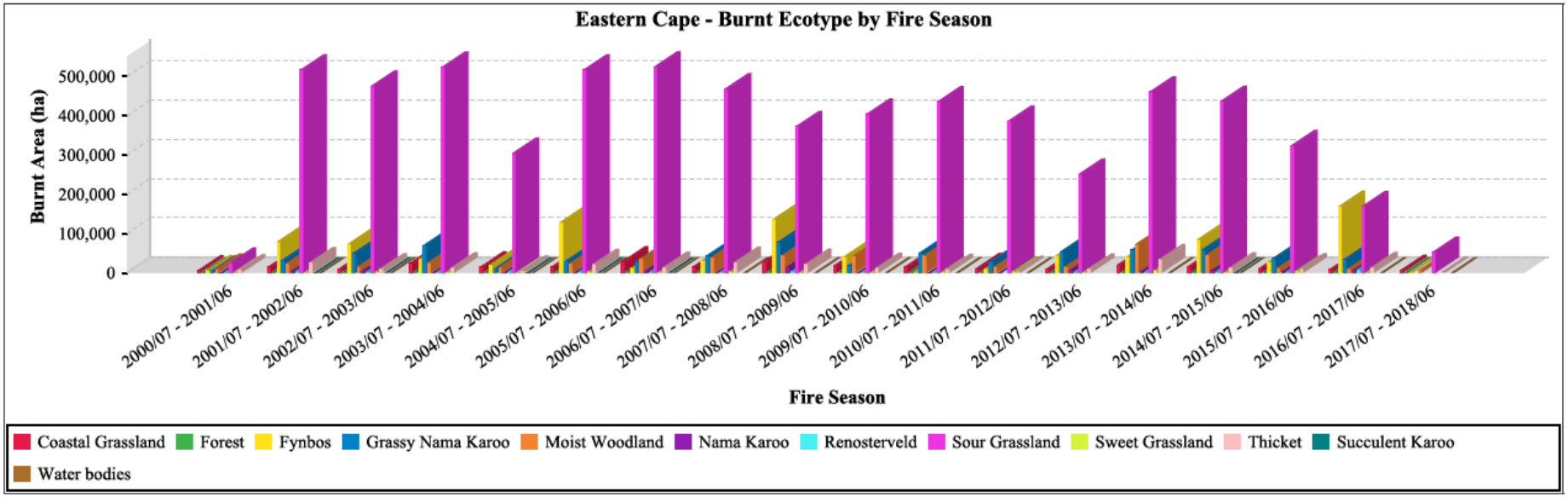


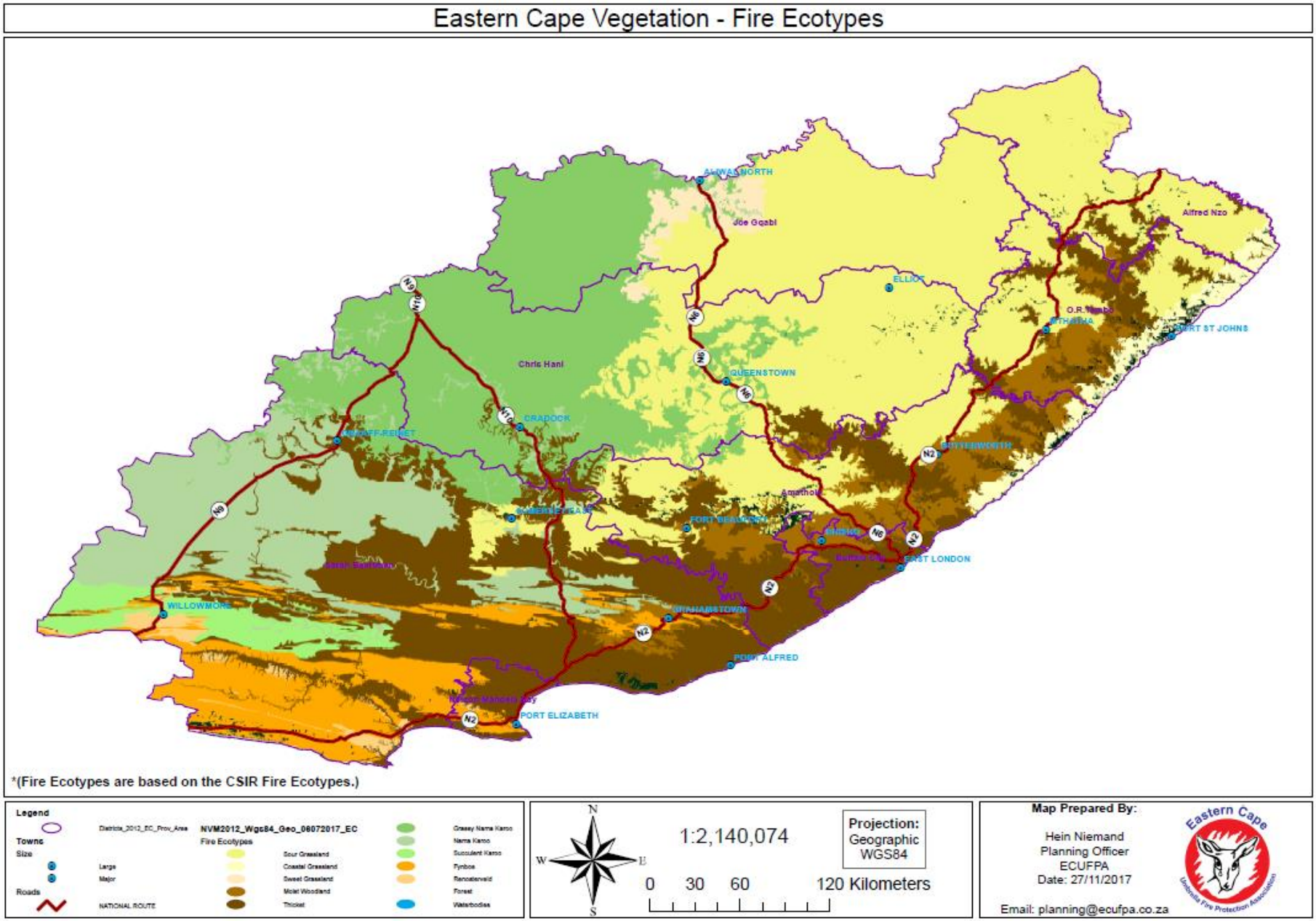
Table1: National comparison between provinces.



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
2000/07 - 2001/06	3,689.65	2,767.89	5,020.53	64.38	1,244.20	44,224.97	0.00	0.00	0.00	0.00	0.00	0.00	57,011.62
2001/07 - 2002/06	44,811.24	16,536.85	20,039.60	7,873.39	14,156.24	31,631.07	88,494.88	256,790.52	200,475.17	15,786.38	0.00	4,223.13	700,818.44
2002/07 - 2003/06	5,728.88	10,474.19	7,659.44	965.44	493.26	14,731.96	168,989.52	160,039.78	172,438.61	66,696.83	30,946.02	3,112.60	642,276.50
2003/07 - 2004/06	5,686.50	12,724.08	2,017.11	429.18	5,365.61	14,326.76	149,414.41	183,564.62	213,828.33	75,408.38	20,484.65	13,438.64	696,688.25
2004/07 - 2005/06	429.15	748.08	0.00	536.17	5,868.08	39,200.61	33,654.95	155,121.66	118,797.00	5,554.25	8,303.35	1,522.08	369,735.38
2005/07 - 2006/06	262.57	1,781.05	5,407.64	1,029.94	1,522.83	7,843.98	221,644.42	197,164.52	157,106.58	73,440.56	72,267.05	3,510.82	742,981.94
2006/07 - 2007/06	8,579.65	15,241.70	1,265.46	2,574.22	31,515.62	202,055.44	77,592.19	165,813.03	135,497.11	4,296.30	1,094.06	4,719.21	650,244.00
2007/07 - 2008/06	581.98	2,038.62	686.69	1,823.55	2,080.50	3,602.89	182,573.22	228,024.12	145,795.58	30,683.05	30,725.81	1,115.13	629,731.12
2008/07 - 2009/06	44,457.93	3,755.16	23,433.07	11,845.29	4,033.17	38,332.35	61,207.81	217,708.98	187,247.50	56,657.82	32,345.49	20,155.36	701,179.94
2009/07 - 2010/06	5,263.15	22,554.70	665.24	1,008.05	4,847.16	13,301.54	105,908.41	158,995.89	195,538.12	15,720.96	8,972.77	6,218.00	538,994.00
2010/07 - 2011/06	0.00	9.42	0.00	364.62	1,157.16	11,794.46	77,196.89	188,257.34	186,070.95	88,446.33	1,863.69	468.82	555,629.62
2011/07 - 2012/06	1,887.49	2,875.53	6,287.41	621.99	7,078.07	38,674.11	17,984.82	158,800.36	173,419.39	39,510.17	8,799.35	750.69	456,689.41
2012/07 - 2013/06	4,996.45	8,261.29	19,001.76	2,896.66	17,205.13	48,568.20	86,789.19	0.00	158,115.00	26,489.64	15,456.91	4,419.62	392,199.84
2013/07 - 2014/06	5,836.28	1,845.53	2,338.84	3,196.32	3,539.15	61,059.78	115,768.49	219,385.91	193,333.34	63,937.49	25,952.37	1,008.22	697,201.75
2014/07 - 2015/06	8,711.38	3,260.89	557.92	750.79	1,394.17	27,811.01	145,974.23	178,446.75	200,198.30	92,163.16	3,723.45	2,488.80	665,480.88
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	102,524.77	60,095.93	24,175.68	7,631.06	110,062.38	420,077.59
2017/07 - 2018/06	0.00	0.00	0.00	0.00	0.00	0.00	67,118.10	0.00	0.00	0.00	0.00	0.00	67,118.10
TOTALS	157,607.14	132,304.98	129,215.93	45,062.84	106,455.76	649,047.88	1,657,381.12	2,696,662.75	2,630,088.75	724,482.31	282,499.31	201,729.50	9,412,539.00

Table 2: Eastern Cape comparison over per month from national figures.



Map 1: Eastern Cape Vegetation Map showing the Fire Ecotypes

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, CSIR Report No: CSIR/NRE/ECO/ER/210/0023/C. The province can be divided into four clear 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.

If we look at table 3, 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 this area.

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	**9 514 936.7**

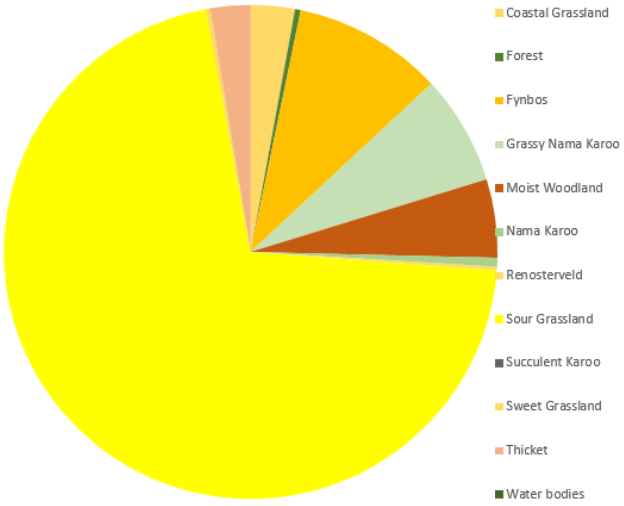


Table 3: Areas burnt per different vegetation type

Fire cycle:

The total area burnt during the past seventeen years, as can be seen in table 4, 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.

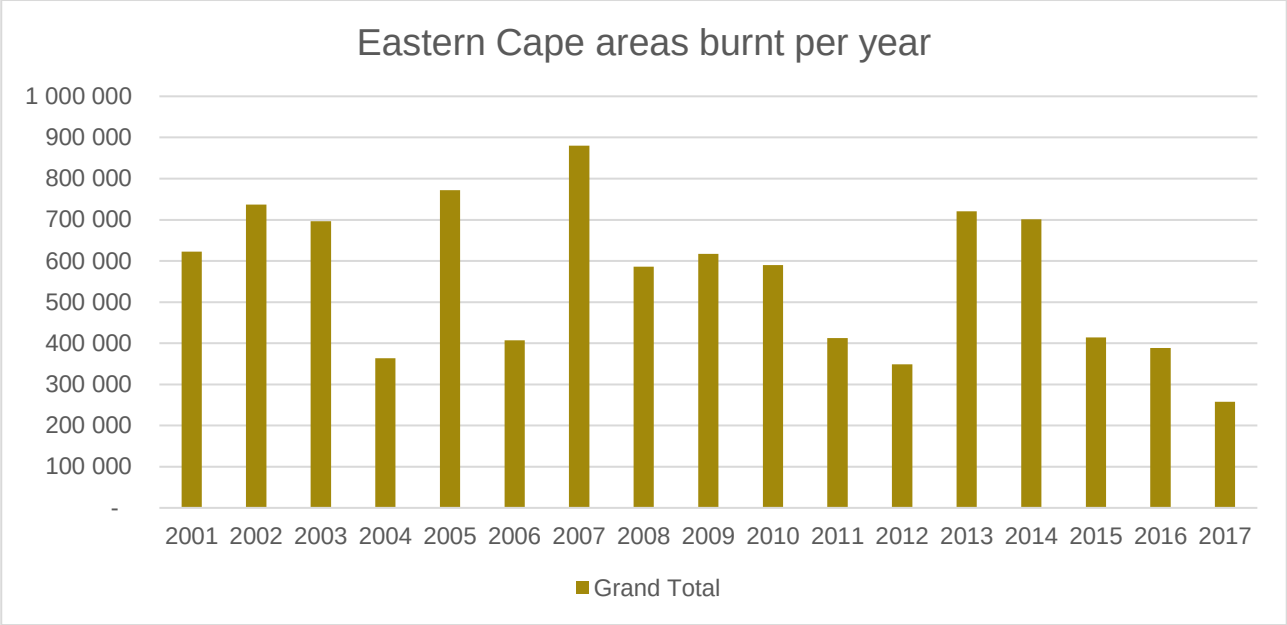


Table 4: Burnt area in the Eastern Cape 2001 -2017

Difference between the Districts of the EC:

The comparison as shown in Table 5 can be directly related to Table 3 (vegetation types). It is clear that the districts with more Sour Grassland are more susceptible to veldfires.

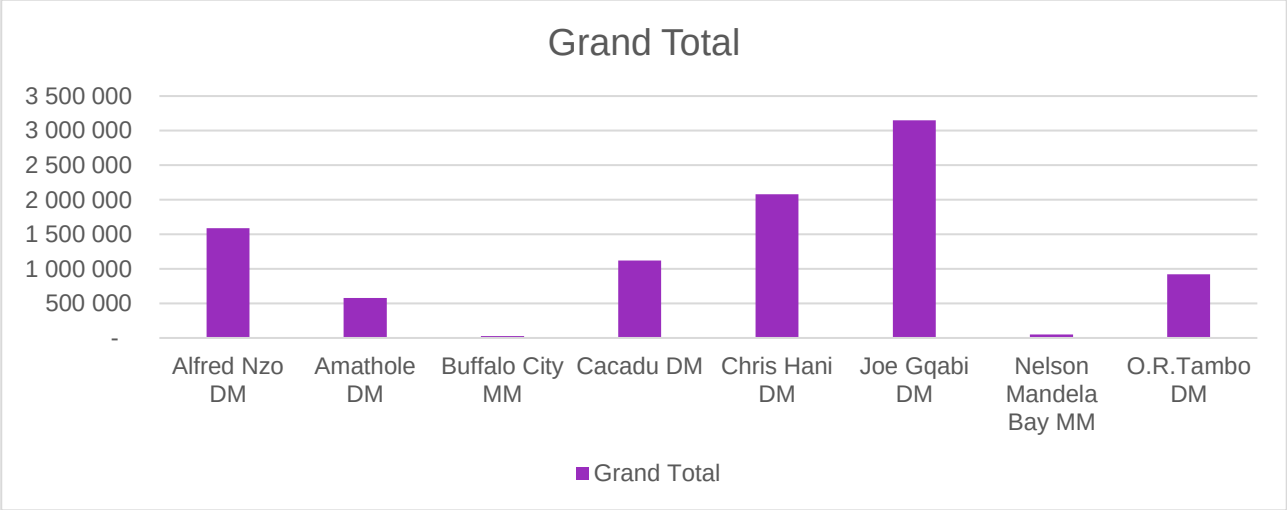


Table 5: Comparison between the District Municipalities.

Acknowledgements:

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  - Mr Ndumiso Booi
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(A special word of Thanks to the Meraka Institute for releasing this data, as well as for all their work in obtaining, processing and compiling the data.)

ANNEXURES

Alfred Nzo District:

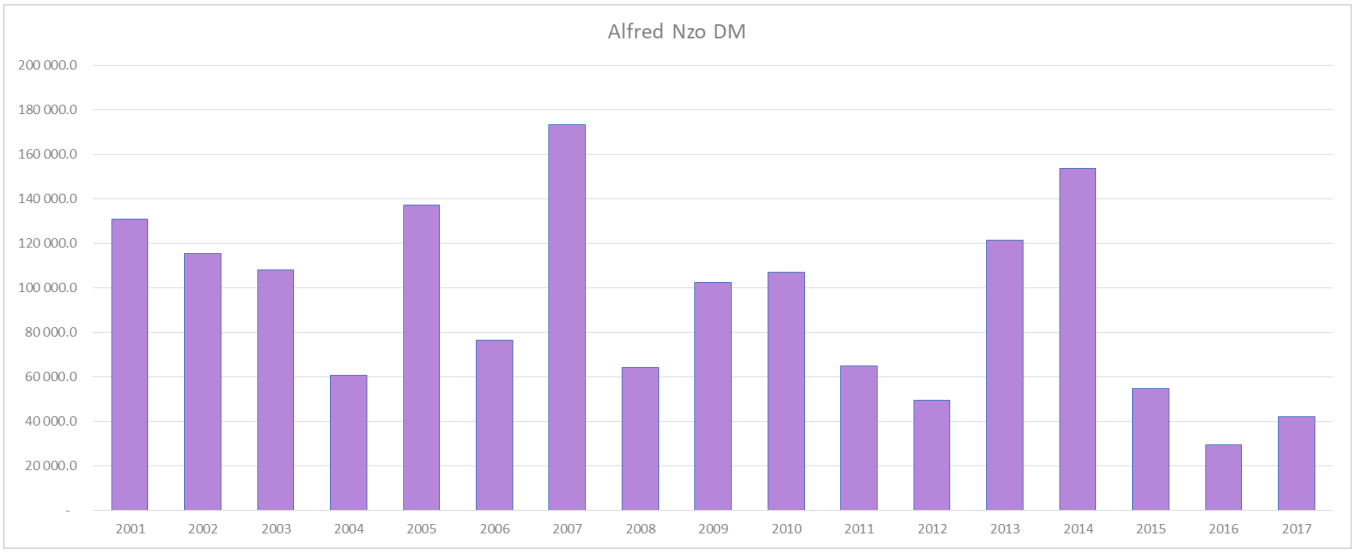

Table 6: Total Burnt Area (in Hectares) for the Alfred Nzo District – 2001 to 2017

Vegetation Type	Area Burnt (Ha)
Coastal Grassland	46 528.6
Forest	2 557.7
Moist Woodland	72 988.8
Sour Grassland	1 456 201.3
Thicket	11 614.1
Water bodies	71.0
Grand Total	1 589 961.5

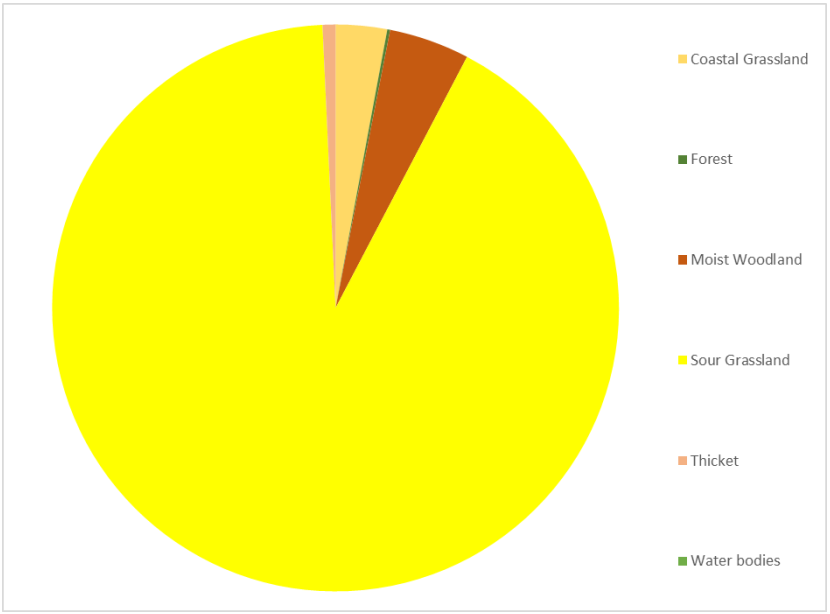

Table 7: Total Areas burnt per vegetation type for Alfred Nzo District – 2001 to 2017

Amathole District:

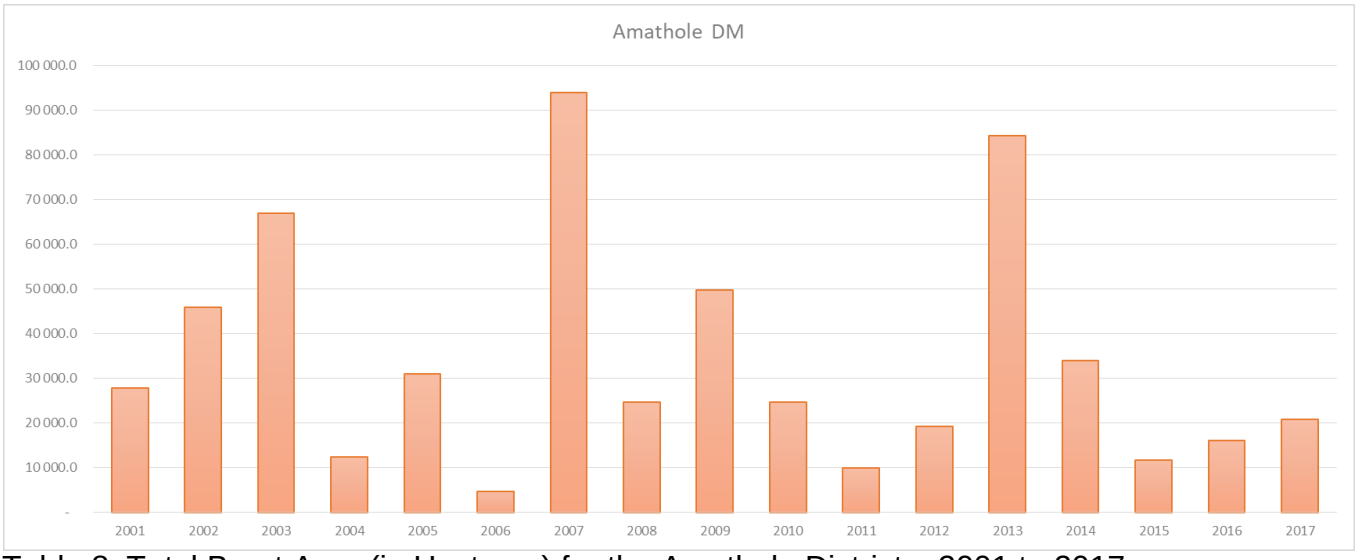

Table 8: Total Burnt Area (in Hectares) for the Amathole District – 2001 to 2017

Vegetation Type	Area Burnt (Ha)
Coastal Grassland	12 685.0
Forest	6 723.7
Grassy Nama Karoo	20 272.9
Moist Woodland	139 243.6
Sour Grassland	313 451.1
Thicket	84 647.3
Water bodies	4.9
Grand Total	577 028.4

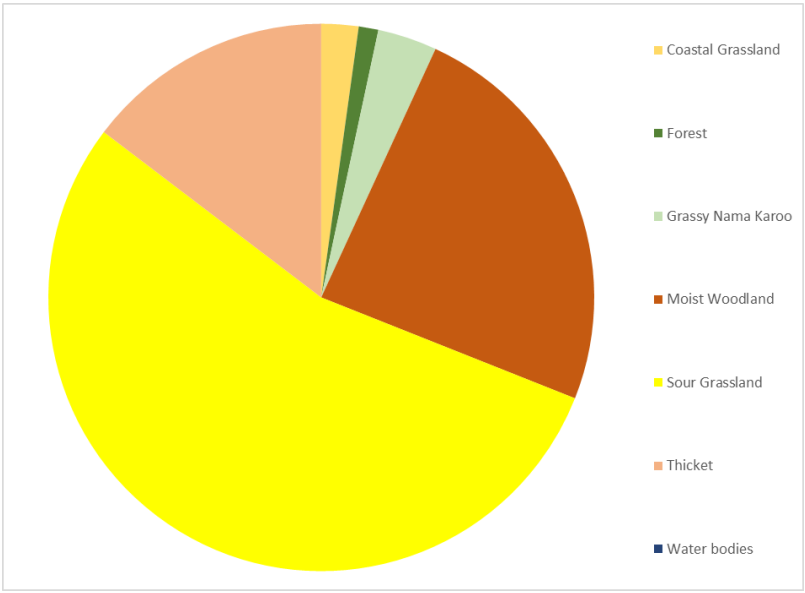

Table 9: Total Areas burnt per vegetation type for Amathole District – 2001 to 2017

Chris Hani District:

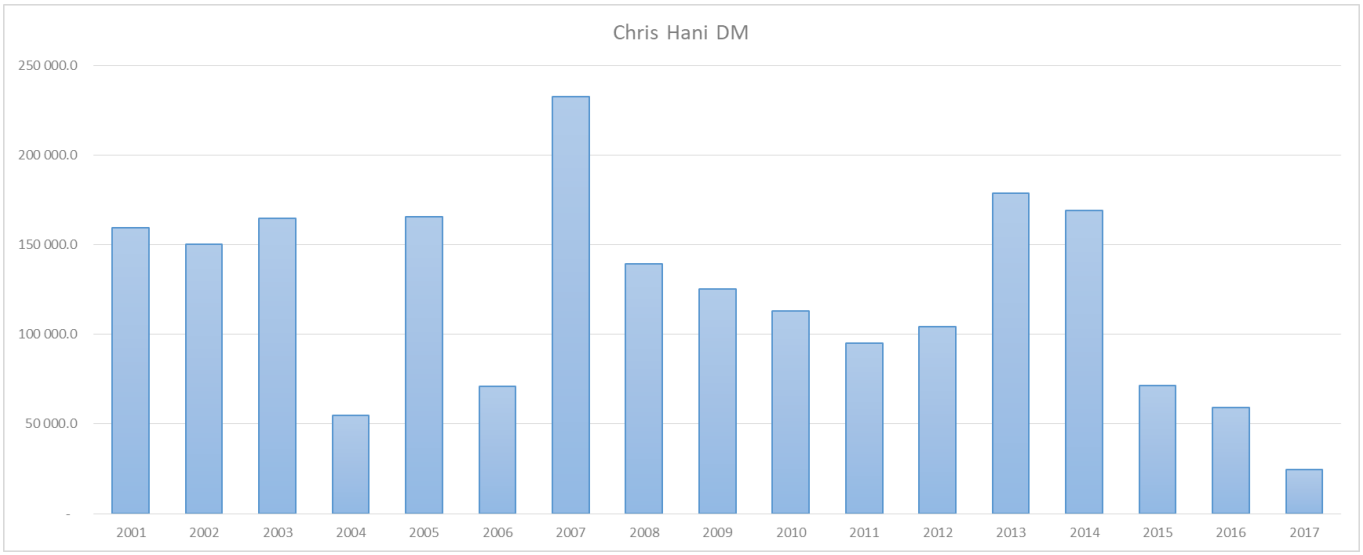

Table 10: Total Burnt Area (in Hectares) for the Chris Hani District – 2001 to 2017

Vegetation Type	Area Burnt (Ha)
Forest	10 339.0
Grassy Nama Karoo	476 102.9
Moist Woodland	5 121.0
Nama Karoo	8 432.6
Sour Grassland	1 547 290.4
Sweet Grassland	3 492.0
Thicket	28 532.7
Water bodies	58.5
Grand Total	2 079 369.0

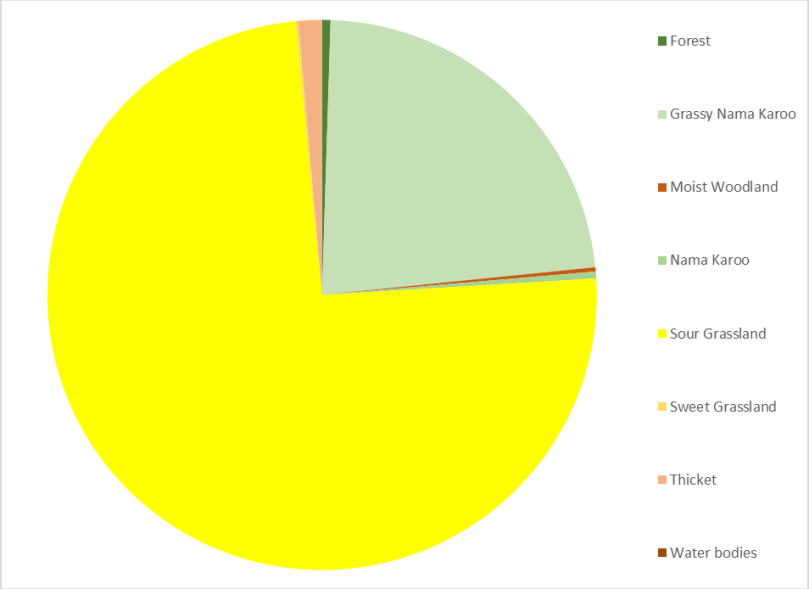

Table 11: Total Areas burnt per vegetation type for Chris Hani District – 2001 to 2017

Joe Gqabi District:

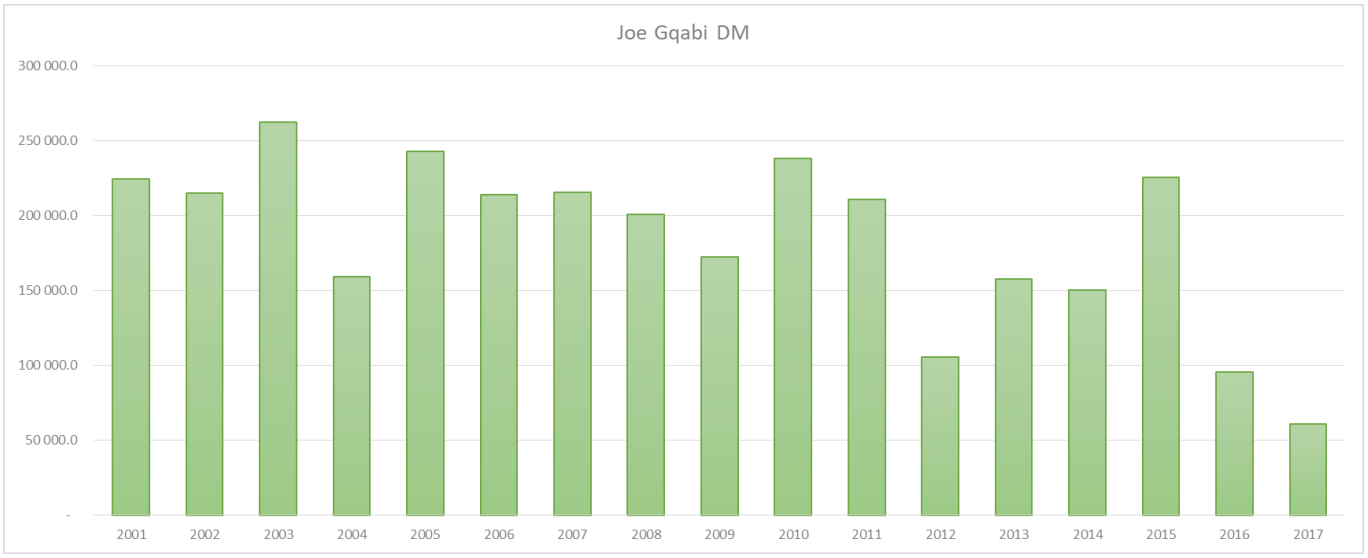

Table 12: Total Burnt Area (in Hectares) for the Joe Gqabi District – 2001 to 2017

Vegetation Type	Area Burnt (Ha)
Forest	261.6
Grassy Nama Karoo	93 778.2
Nama Karoo	954.6
Sour Grassland	3 031 631.0
Sweet Grassland	23 040.0
Thicket	255.7
Grand Total	3 149 921.1

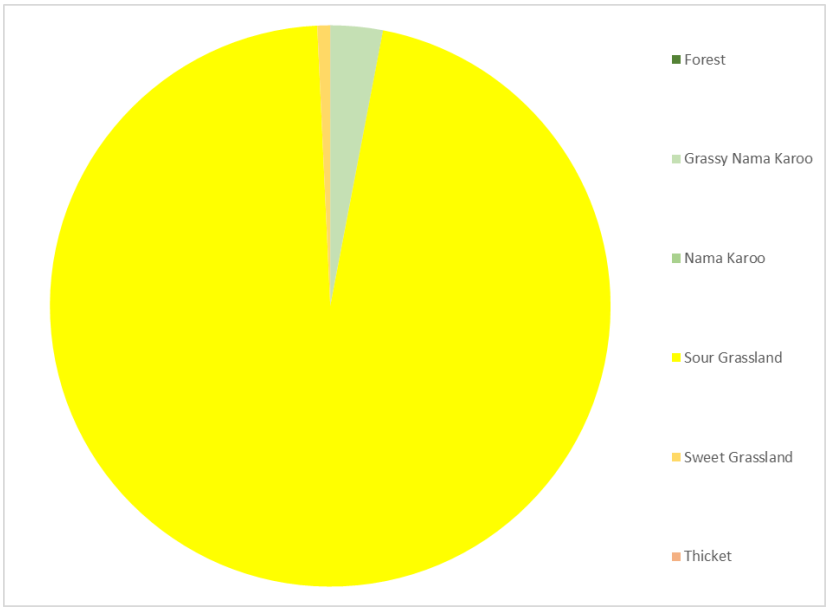

Table 13: Total Areas burnt per vegetation type for Joe Gqabi District – 2001 to 2017

O.R. Tambo District:

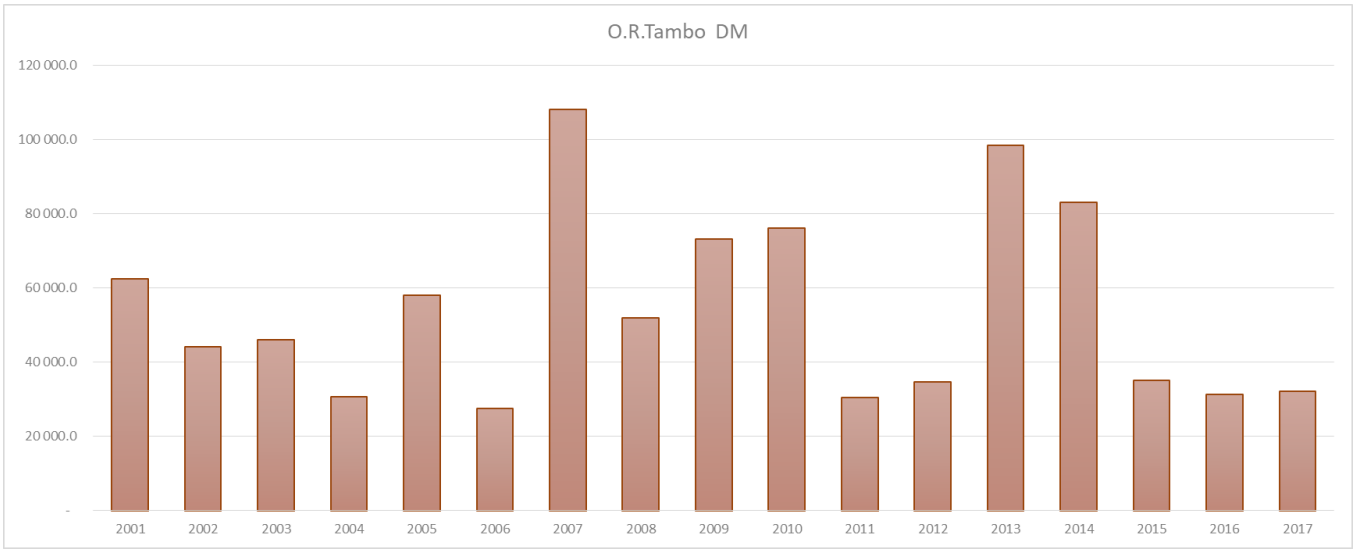

Table 14: Total Burnt Area (in Hectares) for the O.R. Tambo District – 2001 to 2017

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

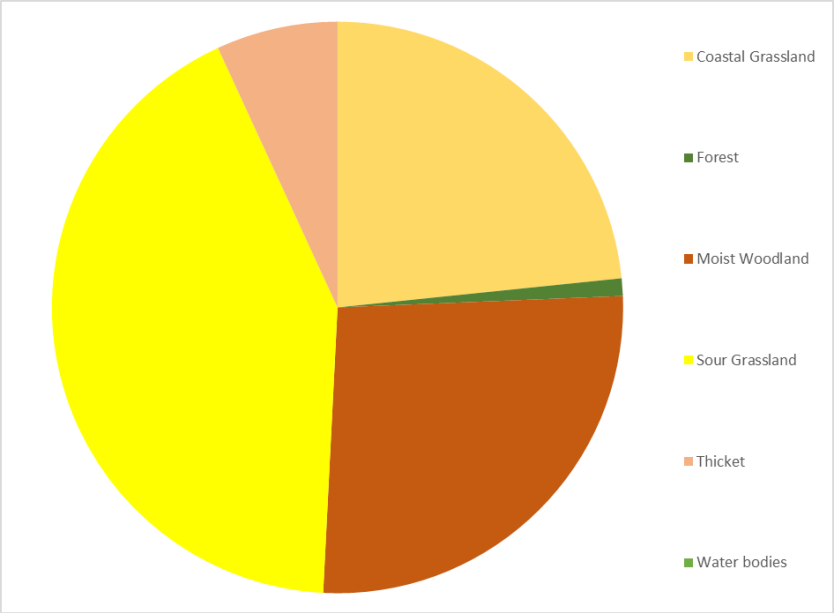

Table 15: Total Areas burnt per vegetation type for O.R. Tambo District – 2001 to 2017

Sarah Baartman District:

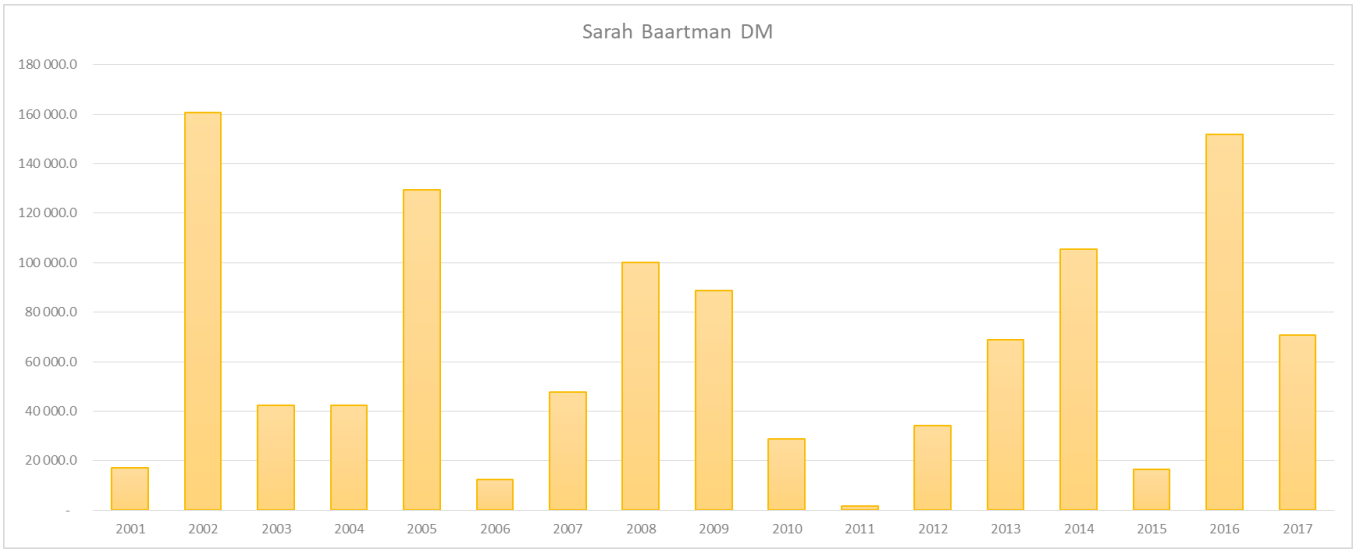

Table 16: Total Burnt Area (in Hectares) for the Sarah Baartman District – 2001 to 2017

Vegetation Type	Area Burnt (Ha)
Forest	4 874.4
Fynbos	900 837.5
Grassy Nama Karoo	92 708.7
Moist Woodland	10 288.7
Nama Karoo	45 603.6
Renosterveld	22 090.8
Sour Grassland	6 005.8
Succulent Karoo	411.3
Thicket	36 438.7
Grand Total	1 119 259.4

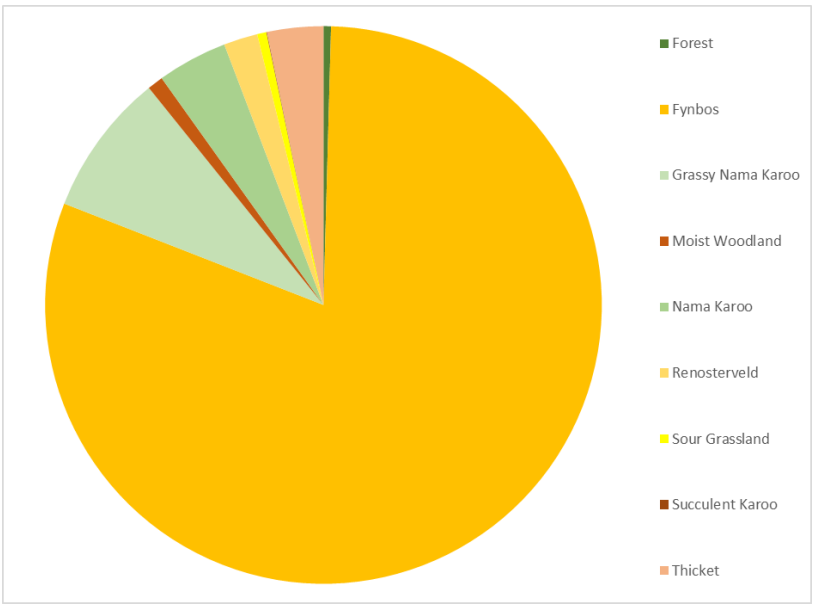

Table 17: Total Areas burnt per vegetation type for Sarah Baartman District – 2001 to 2017