Fire and African browser ungulates - The effect of long-term management burns on the woody component of four different Savanna types.

Fire and African browser ungulates - The effect of long-term management burns on the woody component of four different Savanna types.

by

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DECLARATION AND COPYRIGHT

I hereby declare that the dissertation submitted for the degree Magister Technologiae: Nature Conservation, at Tshwane University of Technology, is my own original work and has not previously been submitted to any other institution of higher education. I further declare that all sources cited or quoted are indicated and acknowledged by means of a comprehensive list of references.

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NAQUITA PAREDES FARIA

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ABSTRACT

The role of fire in savanna's is to maintain the Biome's function and structure with the effect of fire frequency on woody plants yielding conflicting results. This study focused on the long-term effects that various management burns had on woody dominance, structure and density within and in-between treatments of the Experimental Burn Plots, representing four different savanna units in the Kruger National Park, and to link these changes to changes in browse availability. All rooted woody plants were measured and assigned a growth form with the canopy cover for each species estimated using the plant number scale. The PHYTOPTAB PC software provided a classification on the floristic data collected, with the Chi-square test used to analysis the data. The August burns provided the highest browse potential in the Pretoriuskop Sour Bushveld (SVI 10); with the February Triennial Burn providing the same in Granite Lowveld (SVI 3); and the August Triennial Burn in the Tshokwane – Hlane Basalt Lowveld (SVI 5). However, in the Mopani Basalt Shrubland (SVmp 4) the removal of the palatable grass layer is unjustified and even risky considering the low and erratic rainfall of these areas, and therefore, it strongly advised that this Savanna type not be burned.

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CHAPTER 1: INTRODUCTION

1.1 Background history and justification

The Savanna Biome is defined as a tropical grassland, covering a fifth of the worlds land surface, composed of a continuous herbaceous layer with a discontinuous layer of shrubs and trees which are fire tolerant (Van Wilgen, *et al*. 2000:167; Bodini & Clerici, 2016:36). The distribution and structure of this Biome is mostly influenced by water availability, nutrient availability, herbivory and fire (Van Wilgen, *et al.* 2000:167; Van Wilgen, 2009:343).

Historically fires occurred by means of lightning, with humans adapting the use of fire to remove moribund vegetation and improve the palatability of the grass component (Kennedy & Potgieter, 2003:179-180). In sub-Saharan Africa management fires are utilized between the months of July and August, as there is sufficient dry fuel to allow fires to start and spread (Kennedy & Potgieter, 2003:180).

Van Wilgen, *et al.* (2000:167) state that the role of fire in savanna's is to maintain this Biome's function and structure. The most commonly used fires in the Savanna Biome are surface fires which are burned using either a head or back burn (Trollope & Trollope, 2002:9). The occurrence of crown and surface head fires cause the most damage on the topkill of the stems and branches of trees (Trollope & Trollope, 2002:9), with a greater topkill occurring in areas with high fire intensities (De Ronde, *et al*. 2004:61).

The effect of fire frequency on woody plants has yielded conflicting results. Studies conducted in the Kruger National Park (KNP) have shown that there was no change in bush density with different fire frequencies used (De Ronde, *et al*. 2004:65). Other studies found that annual burns increased bush density by 41% (Trollope, 1983:43) while studies conducted by Boultwood & Rodel (1981:111) and Sweet (1982:26) showed that annual burns decreased the density of bush in comparison to areas which have been less frequently burnt.

Fire intensity, frequency and season affect the ability of woody species to regenerate either vegetatively (coppicing) or via seedling germination (Traore, *et al*. 2014:41). Fires at the start of the dry season have a low fire intensity which therefore results in a higher recruitment rate in contrast with higher fire intensities resulting in a lower recruitment rate (Traore, *et al*. 2014:41). Fire may also lead to species becoming multi-stemmed instead of single-stemmed (Traore, *et al*. 2014:41).

Woody plants have adopted two strategies of escaping fire namely early height growth and early bark growth (Dantas & Pausas, 2013:1266). The early height growth strategy is largely associated with savanna areas which are heavily browsed and have a controlled fuel load. This strategy involves plant species which have quick growth spurts, after fire, in order to create a canopy which occurs above the previous flame zone (Dantas & Pausas, 2013:1266). The early bark growth strategy is largely associated with savanna areas which are lightly browsed with more intense fire. This strategy involves plant species allocating their resources to create a thicker bark, which should insulate them from the flames (Dantas & Pausas, 2013:1266).

Changes in woody cover could be as a result of combinations of fire, herbivory, climate change and the impact of humans (Holdo, Holt & Fryxell, 2009:95). Fires together with large herbivores have an influence on the woody cover of savannas (Holdo, Holt & Fryxell, 2009:107). In circumstances where one or more of the above-mentioned components is missing or increased, it could have a drastic effect on the woody cover of an area, whether causing bush encroachment or eliminating the woody component all together (Holdo, Holt & Fryxell, 2009:107). Higher frequency fires have been found to also reduce the woody canopy cover as well as woody plant height (Levick, Baldeck & Asner, 2015:131).

Twenty-seven species of ungulate herbivores are found within the KNP, with 12 species being grazers, three mixed feeders and a further 12 being browsers. Such a diverse herbivore community is a common occurrence within African savannas (Du Toit, 2003:292). The diet of herbivores consists of a variety of plants as well as plant parts, with browsers feeding upon leaves, new shoots and fruits of woody plants and forbs that are within their reach (Owen-Smith, 1979:102). This variety of plants is dependent on accessibility, nutrient value and any anti-herbivore defence the plant may possess (Du Toit, 2003:294). Browsing species generally feed at differing niche heights of the canopy to avoid competition depending on their body size and height, with giraffes feeding at levels higher than that of other species (Du Toit, 2003:295). Large herbivores consume only a small portion of the vegetation components available to them (Owen-Smith, 1979:102).

Browsers have different body sizes which result in feeding at different height levels. Competition is only reduced if larger ungulate species do not feed upon the same level as the smaller ungulate species (Du Toit, 1990:56). The different browsing heights for the browsing ungulate species occurring in the KNP are summarized in Table 1.1. Reference is also made to this study's height class code and the browsing heights in which they occur. Literature consulted in determining the browsing height of the ungulate species included: Du Toit (1990:58); Spencer (1995:450); Breebart (2000:70); Stokke & Du Toit (2000:76-77); Bothma, Van Rooyen & Du Toit (2010:227-229); Pienaar & Du Toit (2010:263); O'Kane, *et al*. (2011:254); and Apps (2012:252 & 261).

Table 1.1: A list of the browsing ungulate species, with an indication of their minimum and maximum browsing heights, occurring in the Kruger National Park

Browsing ungulate species		**Browsing height (m)**	**Height class code (m)***
Scientific name	**Common name**		
Diceros bicornis	Black Rhino	0.5 - 1.2	D1 & S1.5
Tragelaphus scriptus	Bushbuck	0.5 - 1.3	D1 & S1.5
Taurotragus oryx	Eland	0.5 – 2.0	D1, S1.5 & S2
Loxodonta africana	Elephant	0.0 - 3.2	D0.5, D1, S1.5, S2 & T
Giraffa camelopardalis	Giraffe	1.8 - 5.6	S2 & T
Tragelaphus strepsiceros	Greater Kudu	0.5 - 2.5	D1, S1.5, S2 & T
Sylvicapra grimmia	Grey Duiker	0.0 – 1.0	D0.5 & D1
Pelea capreolus	Grey Rhebok	0.0 - 0.3	D0.5
Aepyceros melampus	Impala	0.0 - 1.5	D0.5, D1 & S1.5
Oreotragus oreotragus	Klipspringer	0.0 – 1.0	D0.5 & D1
Tragelaphus angassii	Nyala	0.5 – 2.0	D1, S1.5 & S2
Raphicerus sharpie	Sharpe's Grysbok	0.0 – 1.0	D0.5 & D1
Raphicerus campestris	Steenbok	0.0 – 1.0	D0.5 & D1
Neotragus moschatus	Suni	0.0 - 0.3	D0.5

* Abbreviation codes used in the current study indicating the growth form and height of each recorded category

Plant palatability, used by browsers, was defined by Owen-Smith & Cooper (1987:319) as accessible plant parts which are willingly browsed and highly accepted throughout the whole year, with the term unpalatable being defined as browsed plant species consumed only during restricted periods.

Browsers may prefer certain woody species during the wet season (*Grewia flavescens*; *Dichrostachys cinerea;* and *Diospyros lycioides*) and reject others, but during the dry seasons most rejected species would then become acceptable (*Euclea natalensis*; *Grewia bicolor*; and *Dombeya rotundifolia*) with few species being continuously rejected in both seasons (*Ochna pulchra; Terminalia sericea; Gymnosporia buxifolia* and *Peltophorum africanum*) (Owen-Smith, 1979:105; Owen-Smith & Cooper, 1987:322; Furstenburg & Van Hoven, 1994:429-430; Wiseman, Page & O'Connor, 2004:33; Gordijn, Rice & Ward, 2012:411).

Similar results were found by Hooimeijer, *et al*. (2005:96-98) and Kos, *et al*. (2012:283-285) who conducted studies in the Mopane Veld. They found that *Colophospermum mopane* would be browsed more in the drier seasons compared to the wet seasons. Hooimeijer, *et al*. (2005:100) concluded that this was possibly due to more species (*Combretum apiculatum*; *Terminalia pruniodes*; and *Boscia albitrunca*) becoming readily available, in terms of green leaf material, in the wetter seasons compared to drier seasons, while *Colophospermum mopane* still carries its leaves into the dry season while other deciduous species have commenced or completed leaf drop.

A number of factors could contribute to the selection of potential browsing material by browsers. These factors include nutrients available; defence mechanisms of plants (e.g. morphological or chemical); growth stage of the plant and its leaves; soil nutrients; and light availability (Owen-Smith & Cooper, 1987:319). Browsers are more affected by changes in the abundance of their food supply compared to that of grazers due to the falling of leaves in the winter months (Owen-Smith, 1979:102). High frequency burning results in woody plants having a shorter time to regenerate, thus reducing the potential browse (Mukinya, 1977:133). Palatability of woody plants is influenced by chemical defence, nutritional characteristics of leaves at different phenological stages and structural defence (Smit, Rethman & Moore, 1996:82).

Fire could potentially influence woody density (accessibility) and woody structure (height classes) and could thus have a direct influence on browse availability and species selection. Smit, Rethman & Moore (1996:78) stated that an increase in tree and shrub density could result in a reduced production of palatable woody and herbaceous species thus increasing the occurrence of pseudo-droughts (Richter, Snyman & Smit, 2001:108) as a result of increased competition. In the Pretoriuskop Sour Bushveld (SVl 10); Granite Lowveld (SVl 3); Tshokwane – Hlane Basalt Lowveld (SVl 5); and Mopani Basalt Shrubland (SVmp 4) vegetation units, bush encroachment occurs in areas where the tree densities are greater than 1 500 ind/ha (Richter, Snyman & Smit, 2001:108).

The use of fire as a management tool to provide fresh grass growth, removal of moribund grasses and reduce bush thickening in the KNP has shifted from not burning to burning management blocks since 1926. Fire was used occasionally between 1926 and 1948 to create revitalized forage and not burned at all between 1948 and 1956 (Van Wilgen, *et al.* 2000:167). Between 1956 to 1992, the KNP was divided into various burn blocks which were only burned at three-year cycles (Van Wilgen, *et al*. 2000:167). In the years between 1992 and 2001 fires were once again stopped with only lightning fires being allowed to burn. This was found to be problematic since lightning fires compromised approximately only 10% of the fires occurring in the KNP at the time (Van Wilgen, *et al*. 2000:167). The current policy manages areas according to "thresholds of potential concern" or TPC's. The KNP management has generated minimum and maximum thresholds that an area must comply with before management can take action. In terms of fire, this action is in the form of point-ignition burns that are allowed to run their own course to create a "mosaic" system (Van Wilgen, Govender & Macfadyen, 2008:22).

In 1954 the Experimental Burn Plot (EBP) trial was initiated by Van der Schijff, (1958:60-93) in the KNP with the trial running for just over 60 years. The objective of this trial was to determine the effect of fire on four different vegetation units within the KNP as well as their linked biotic populations (Biggs, *et al.* 2003:2). This has created an opportunity for studies to examine the long-term effect of various fire management treatments on various components in the four different vegetation units.

Enslin, *et al*. (2000:27-37) investigated the long-term effects of fire frequency and season on the woody vegetation dynamics of the *Sclerocarya birrea/Senegalia* *nigrescens* Savanna of the KNP. This study was conducted in the Satara Experimental Burn Plot (EBP) and compared 14 different treatments within this EBP. The study focused on woody species composition, woody density the structural changes between the different treatments and found no significant changes in woody species with density only increasing in triennial treatments.

Kennedy & Potgieter (2003:179-192) investigated whether the season of burning had an effect on the growth and abundance of *Colospermum mopane*. This study was conducted in all the replicates of the Mopani EBP, with only the October Biennial Burn, August Biennial Burn, and No Burn treatments surveyed. There was a significant increase in tree height in the exclusion plots, with trees in the August burns being shorter than those in the February burns, with abundance of *C. mopane* being greater in the August burns in comparison to the exclusion plots.

Higgins, *et al*. (2007:1119-1125) investigated the long-term effect of the manipulation of fire on woody densities. Data were collected from each treatment within each replicate across all four EBP's. The data from the original woody surveys (1956-1957) were then compared to data collected between 1996 and 1999 and found that woody densities across all four EBP's did not decrease with the increase in fire frequency.

Devine, *et al.* (2015:473-478) investigated the long-term effect of different fire frequencies (annual, biennial and triennial) on woody cover, abundance and stem structure. This studied focused on two different savanna rainfall regions, namely the Pretoriuskop and Skukuza EBP's, within the KNP with the emphasis on rainfall. There was a greater reduction in tree abundance in the wet savanna than the dry, irrespective of the fire frequency with woody cover being higher in the No Burn plots compared to the burnt plots across both savanna types.

These studies focused on several different variables but to date no study has been conducted on the effect of fire frequency and time of burning on the woody component and how this influences available browse. The current study is not only applicable to KNP but to any savanna.

1.2 Research aim

The primary aim of this study was to determine the long-term effect of various fire treatments on dominant woody species, woody structure and woody density within and in-between treatments in the Experimental Burn Plots (EBP’s). These EBP's represent four different Savanna types in the Kruger National Park (KNP).

The secondary aim of this study was to evaluate the influence of these fire treatments on the woody structure and density in all four Savanna types and to link these changes to changes in browse availability.

1.3 Research objectives

- To determine the impact of the various fire treatments, within and between treatments, in each EBP, on:
    1. Dominant woody species;

2. Woody plant structure/height; and
3. Woody plant density.

- To determine how the various fire treatments, within and between EBP’s, influenced browse availability (structural changes) and palatability.

CHAPTER 2: STUDY AREA

2.1 Background

The Kruger National Park (KNP) is situated within the Savanna Biome (Mucina & Rutherford, 2006:439) and covers an area of 1 948 528 ha (Van Wilgen, *et al.* 2000:167). It is located in the north-east of South Africa, representing portions of both the Limpopo and Mpumalanga Provinces (Van Wilgen, Govender & Macfaden, 2008:22).

The topography of the KNP has mostly been influenced by the weathering of the underlaying rocks (Venter, Scholes & Eckhart, 2003:84) with elevations ranging from 260 m to 839 m above mean sea level (Van Wilgen, *et al*. 2000:167). The rainfall of the KNP is strongly concentrated between the months of October and April (Venter, Scholes & Eckhart, 2003:87) and varies between 350 mm and 750 mm per annum (Van Wilgen, *et al.* 2000:168). The KNP has high mean summer temperatures (approximately 30 °C) with generally frost free and mild winters (approximately 20 °C) (Venter, Scholes & Eckhart, 2003:91).

Norman & Whitfield (2006:205) divided the KNP longitudinally into two portions based on the geological substrate associated with these two areas. The western portion consists primarily of granites, with protruding granitic rock formations. The eastern portion is underlain primarily by basalt but also include rhyolite formations such as the Lebombo Hills (Van Wilgen, *et al*. 2000:168) with sedimentary intrusions of the Karoo Supergroup (Norman & Whitfield, 2006:205).

The flora in the KNP compromises of approximately 1 983 species which includes more than 400 tree and shrub species and over 200 grass species (Van Wilgen, *et al*. 2000:168). The vegetation units of the four Experimental Burn Plots (EBP's) were described by Mucina & Rutherford (2006:448) with the differences in vegetation being a result of the shift in rainfall patterns from south to north with areas around Pretoriuskop and Skukuza being wetter than those around Satara and Mopani (Devine, *et al*. 2015:474).

Twelve different fire treatments were applied since 1954 in the KNP. These treatments were conducted in four replicates, at four different ecological zones (Biggs, *et al*. 2003:2). These four ecological zones include the Sour Bushveld of Pretoriuskop (mesic), a more xeric mixed bushveld around Skukuza, the Arid Lowveld (Satara) and the Mopani Veld (Figure 2.1).

Biggs, *et al*. (2003:7-8) stated that approximately 80% of the total scheduled burns took place during the course of the Experimental Burn Plot trial. The deviation from the burns was largely due to areas not being burnt in specific years due to a low vegetation cover (caused by drought and/or high herbivory) and conditions being too moist to conduct burns. A number of accidental fires have also occurred mainly due to fires from outside the plots jumping the fire-breaks (Biggs, *et al*. 2003:7-8).

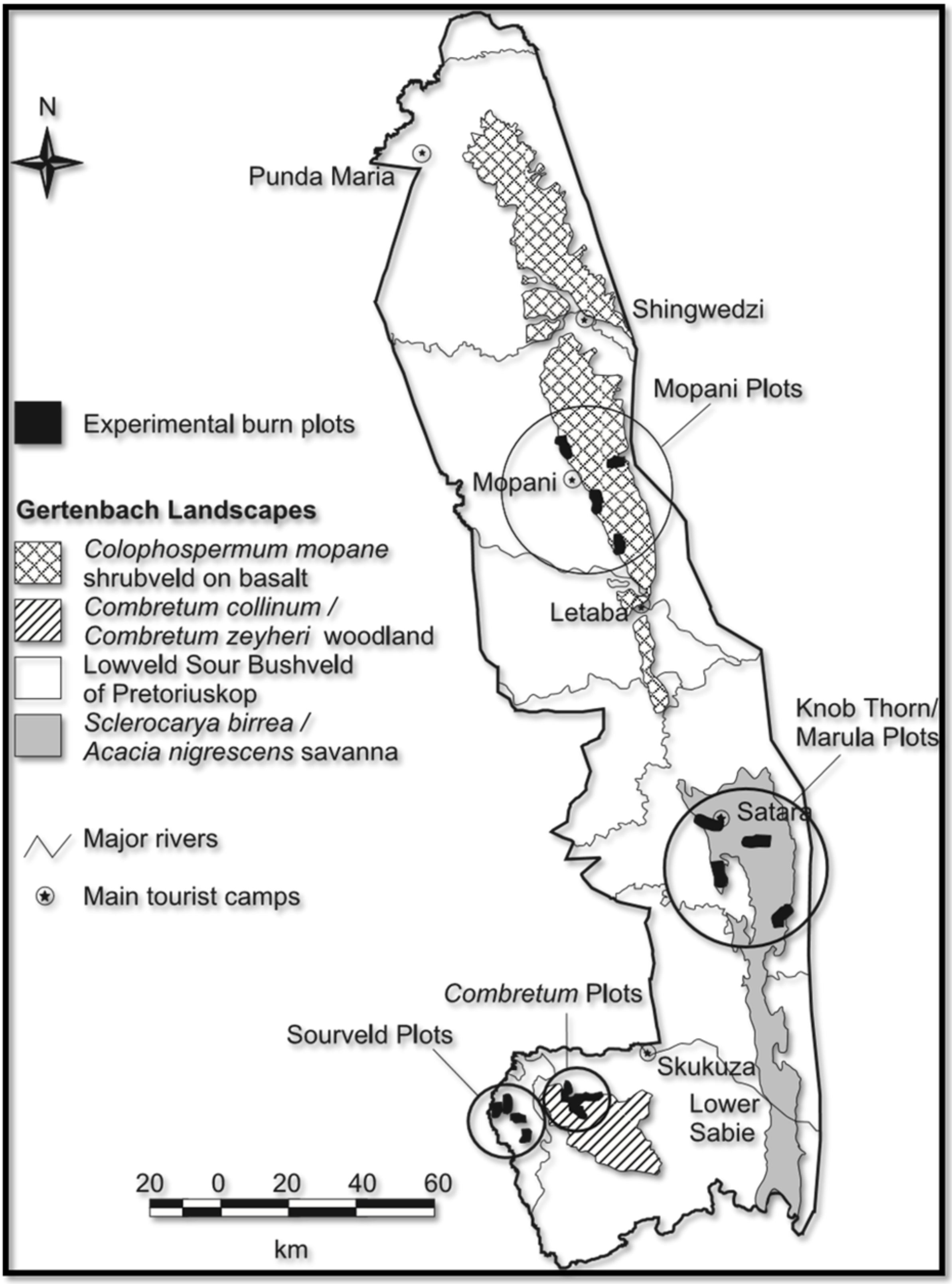

Figure 2.1: The location of the Experimental Burn Plots in the Kruger National Park (Biggs, *et al*. 2003:3). Vegetation Landscape unit's names are those coined by Gertenbach (1983:10-83).

2.2 Study sites

2.2.1 Pretoriuskop Experimental Burn Plot

The Pretoriuskop EBP vegetation was described by Mucina & Rutherford, (2006:497) as the Pretoriuskop Sour Bushveld (SVI 10) (Figure 2.2) whereas Gertenbach (1983:10) classified it as the Lowveld Sour Bushveld of Pretoriuskop comprising of sandy granitic soils.

Figure 2.2: Position of the Pretoriuskop Experimental Burn Plots superimposed on Mucina & Rutherford's (2006:42) vegetation units in the Kruger National Park.

The Pretoriuskop EBP occurs in the south-west region of the KNP (Figure 2.1) at an altitude ranging from 400 m to 700 m above mean sea level (Mucina & Rutherford, 2006:497) with a mean annual rainfall of 677 mm (Figure 2.3) and mean annual temperature of 20.1 °C (Figure 2.4).

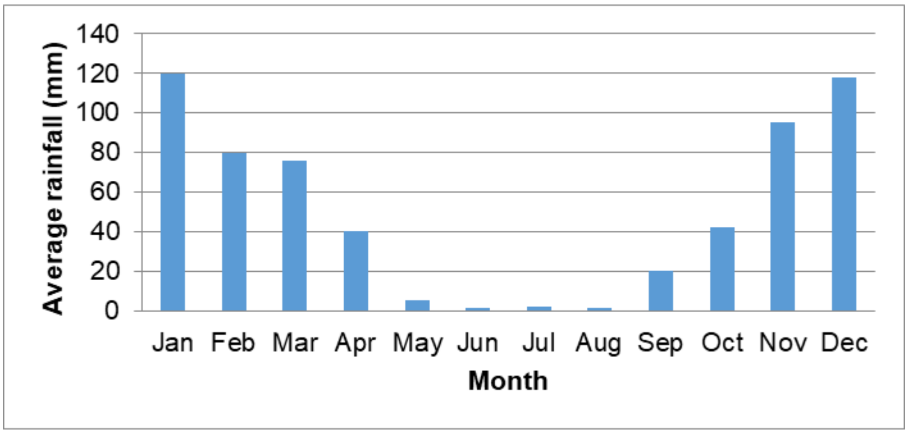

Figure 2.3: Mean annual rainfall of the Pretoriuskop Experimental Burn Plot, located in the southern portion of the Kruger National Park (Mucina & Rutherford, 2006:490).

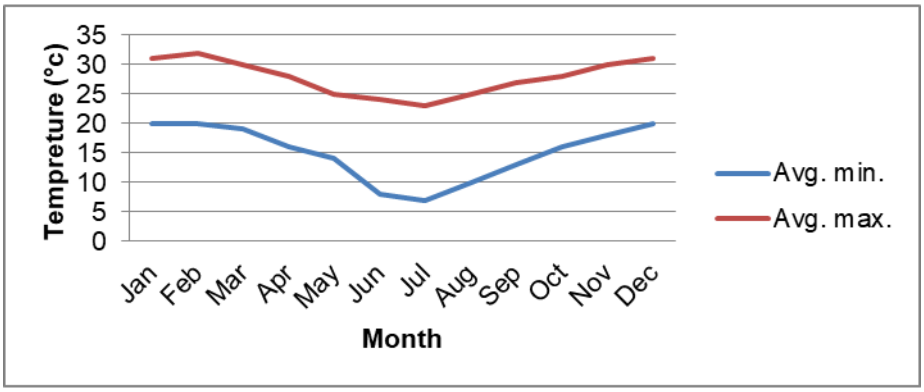

Figure 2.4: Mean maximum and minimum monthly temperatures of the Pretoriuskop Experimental Burn Plot, located in the southern portion of the Kruger National Park (Mucina & Rutherford, 20 06:490).

The landscape of the Pretoriuskop EBP was described by Mucina & Rutherford (2006:497) as ranging from forest to open tree savanna located in higher lying areas. Geology associated with this EBP is Granite and Gneiss with intrusions of Dolerite or Gabbro (Mucina & Rutherford, 2006:497). The dominant soil form is a Hutton with Clovelly intrusions (Venter & Govender, 2012:4).

The dominant plant growth forms of the Pretoriuskop EBP (Mucina & Rutherford, 2006:497) are small trees (>10 m in forests and <10 m in savanna) and large shrubs (>2 m in height). Important species in the small tree growth form include: *Combretum apiculatum*; *Terminalia sericea* and *Peltophorum africanum*, whereas the important species in the tall shrubs' growth form include: *Dichrostachys cinerea* and *Gymnosporia senegalensis* (Mucina & Rutherford, 2006:497).

2.2.2 Skukuza Experimental Burn Plot

Mucina & Rutherford (2006:492) described the vegetation unit representing the Skukuza EBP as the Granite Lowveld (SVI 3) (Figure 2.5), whereas Gertenbach (1983:21) classified it as Thickets of the Sabie and Crocodile Rivers.

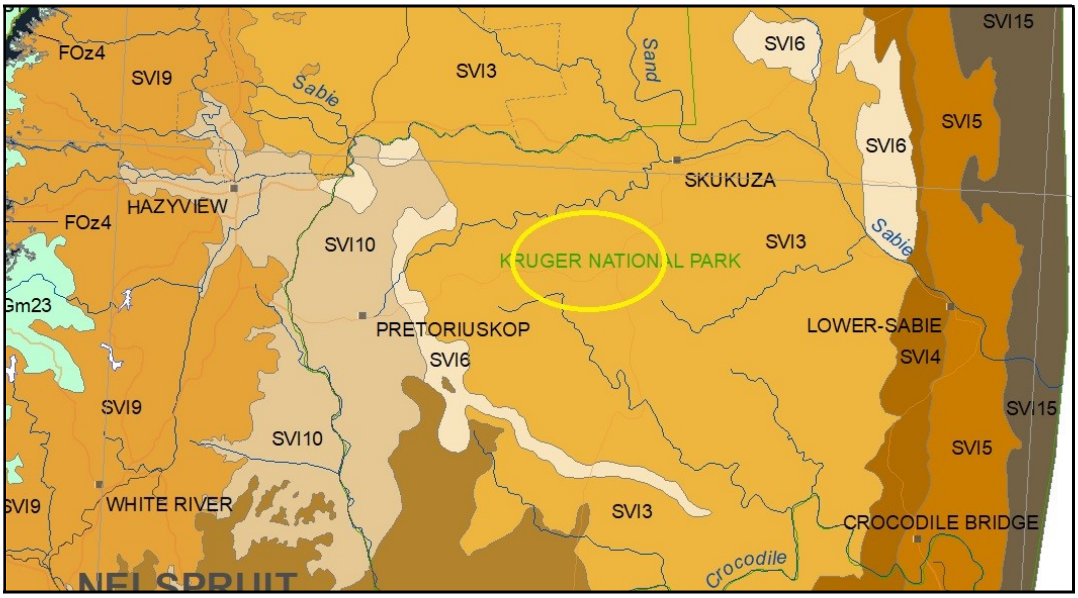

Figure 2.5: Position of the Skukuza Experimental Burn Plots superimposed on Mucina & Rutherford's (2006:42) vegetation units in the Kruger National Park.

The Skukuza EBP occurs in the south west region of the KNP (Figure 2.1) at an altitude of 250 m to 750 m above mean sea level (Mucina & Rutherford, 2006:492). This study site receives a mean annual rainfall of 633 mm (Figure 2.6) with a mean annual temperature of 20.9 °C (Figure 2.7) (Mucina & Rutherford, 2006:492).

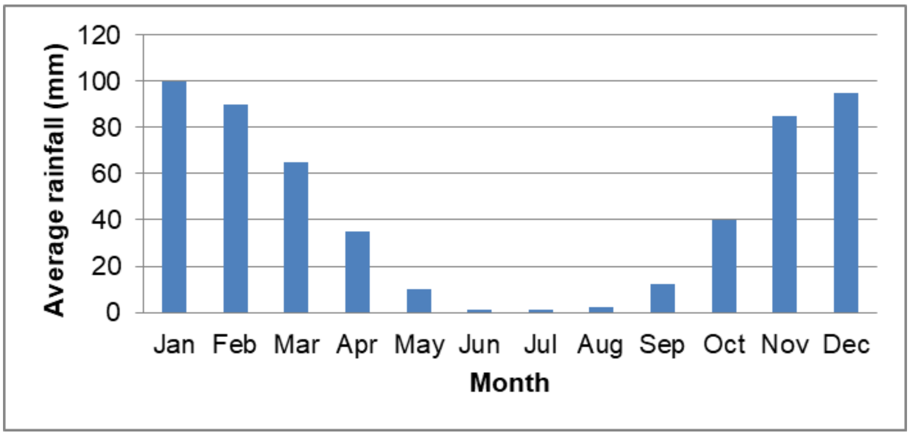

Figure 2.6: Mean annual rainfall of the Skukuza Experimental Burn Plot, located in the south of the Kruger National Park (Mucina & Rutherford, 2006:490).

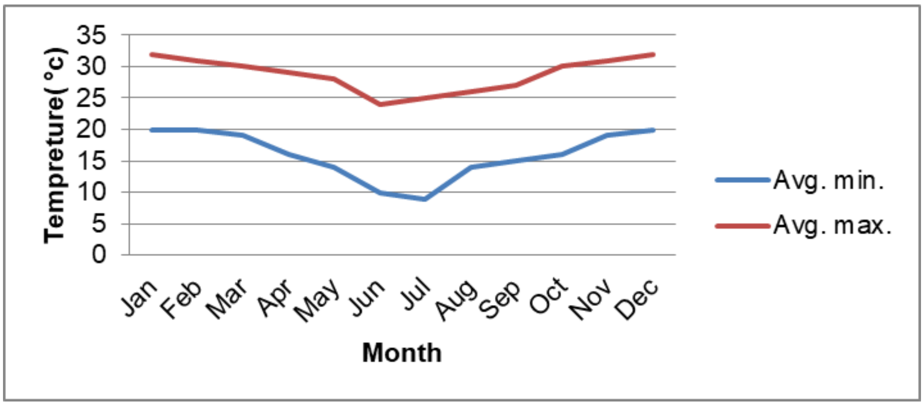

Figure 2.7: Mean maximum and minimum monthly temperatures of the Skukuza Experimental Burn Plot, located in the south of the Kruger National Park (Mucina & Rutherford, 2006:490).

According to Mucina & Rutherford (2006:492) the landscape for the Skukuza EBP was described as a tall shrubland, with few trees, to dense low woodlands. The geology associated with this EBP is Granite and Gneiss with intrusions of Dolerite (Mucina & Rutherford, 2006:492; Venter & Govender, 2012:4). The dominant soil forms are Clovelly, Hutton and Glenrosa with intrusions of Escort (Venter & Govender, 2012:4; Mucina & Rutherford, 2006:492).

Mucina & Rutherford (2006:492) described the dominant growth form for the Skukuza EBP as small trees (<10 m in savanna). Important tree species include: *Terminalia sericea, Combretum zeyheri* and *Combretum apiculatum* (Mucina & Rutherford, 2006:492).

2.2.3 Satara Experimental Burn Plot

Mucina & Rutherford (2006:493) classified the vegetation of the Satara EBP as the Tshokwane – Hlane Basalt Lowveld (SVl 5) (Figure 2.8) whereas Gertenbach (1983:62) classified it as *Sclerocarya birrea/Senegalia nigrescens* Savanna on clay basaltic soils.

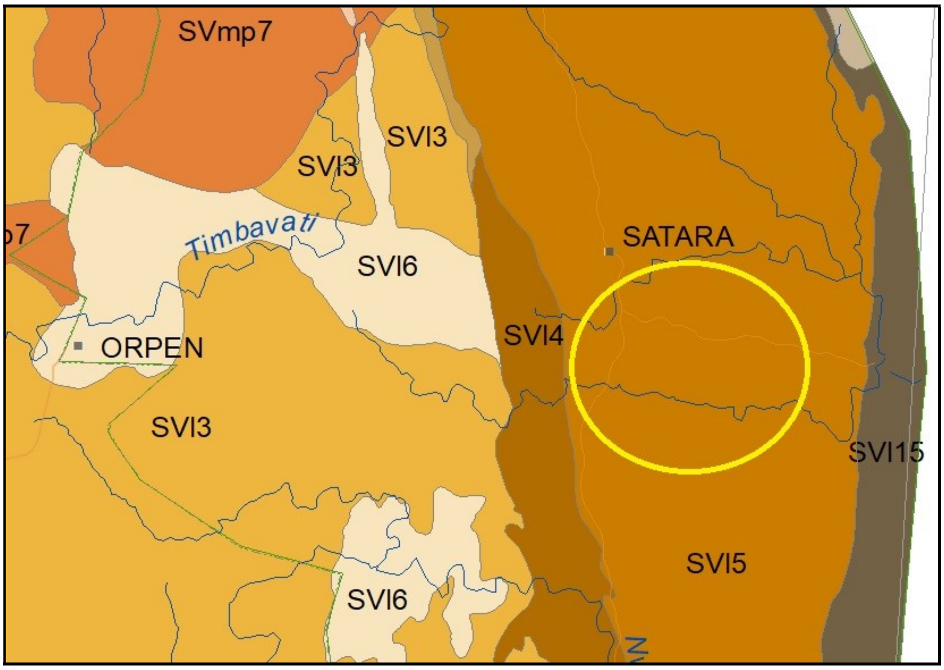

Figure 2.8: Location of the Satara Experimental Burn Plots superimposed on Mucina & Rutherford's (2006:493) vegetation units in the Kruger National Park.

The Satara EBP occurs in the central region of the KNP (Figure 2.1) at an altitude of 100 m to 400 m above mean sea level (Mucina & Rutherford, 2006:493). This study site receives a mean annual rainfall of 472 mm (Figure 2.9) and has a mean annual temperature of 21.7 °C (Figure 2.10) (Mucina & Rutherford, 2006:493).

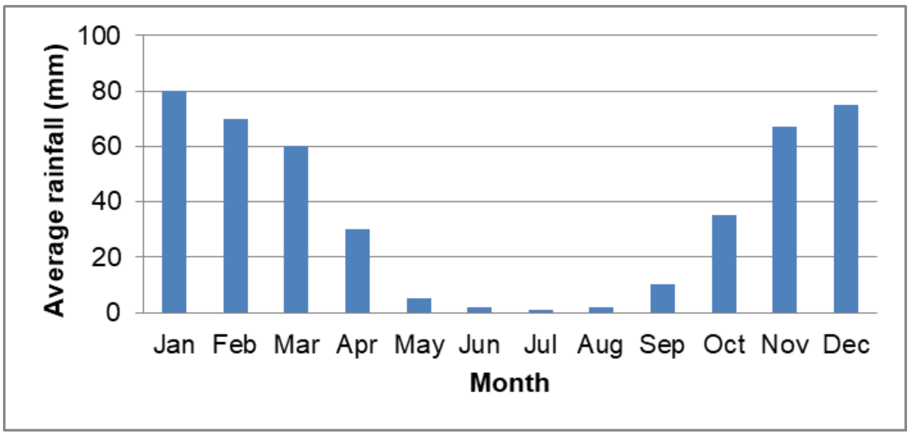

Figure 2.9: Mean annual rainfall of the Satara Experimental Burn Plot, located centrally in the Kruger National Park (Mucina & Rutherford, 2006:490).

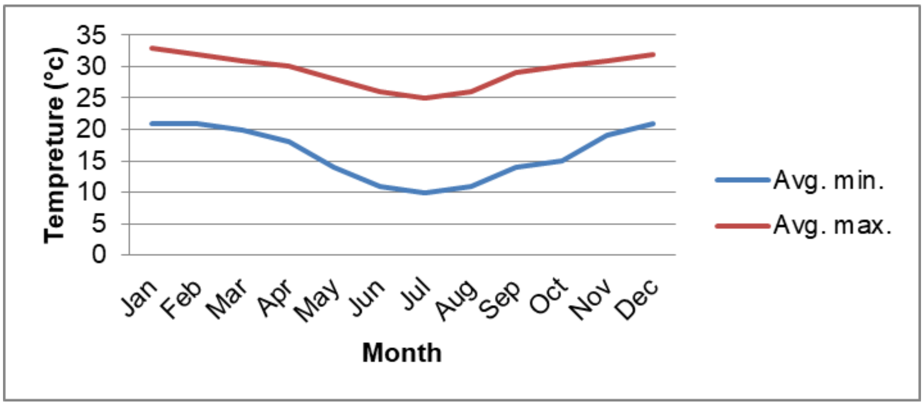

Figure 2.10: Mean maximum and minimum monthly temperatures of the Satara Experimental Burn Plot, located centrally in the Kruger National Park (Mucina & Rutherford, 2006:490).

The landscape for the Satara EBP was described by Mucina & Rutherford (2006:493) as fairly flat plains with an open tree savanna to a moderately developed shrub layer. The important species in the small tree growth form include: *Vachellia nilotica*, *Combretum hereroense* and *Combretum imberbe* whereas the important species in the tall tree growth form include: *Senegalia nigrescens, Sclerocarya birrea* subsp. *caffra* and *Philenoptera violacea* (Mucina & Rutherford, 2006:494).

The geology described by Venter & Govender (2012:4) and Mucina & Rutherford (2006:493) is Basalt with Dolerite intrusions. Dominant soil forms are Shortland and Swartland with intrusions of Bonheim and Arcadia (Venter & Govender, 2012:4).

2.2.4 Mopani Experimental Burn Plot

The vegetation of the Mopani EBP was classified by Mucina & Rutherford (2006:486) as the Mopani Basalt Shrubland (SVmp 4) (Figure 2.8) whereas Gertenbach (1983:83) classified it as *Colophospermum mopane* shrubveld on basalt with clay basaltic soils.

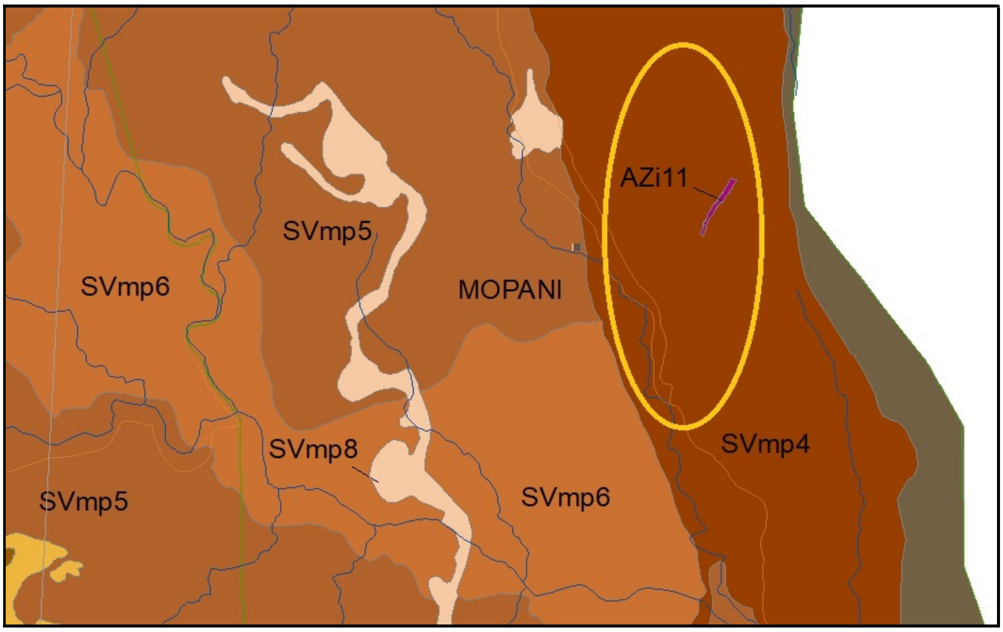

Figure 2.11: Location of the Mopani Experimental Burn Plots superimposed on Mucina & Rutherford's (2006:493) vegetation units in the Kruger National Park.

The Mopani EBP is located in the northern region of the KNP (Figure 2.11) at an altitude of 200 m to 450 m above mean sea level (Mucina & Rutherford, 2006:486). This study site receives a mean annual rainfall of 507 mm (Figure 2.12) with a mean annual temperature of 22.0 °C (Figure 2.13) (Mucina & Rutherford, 2006:486).

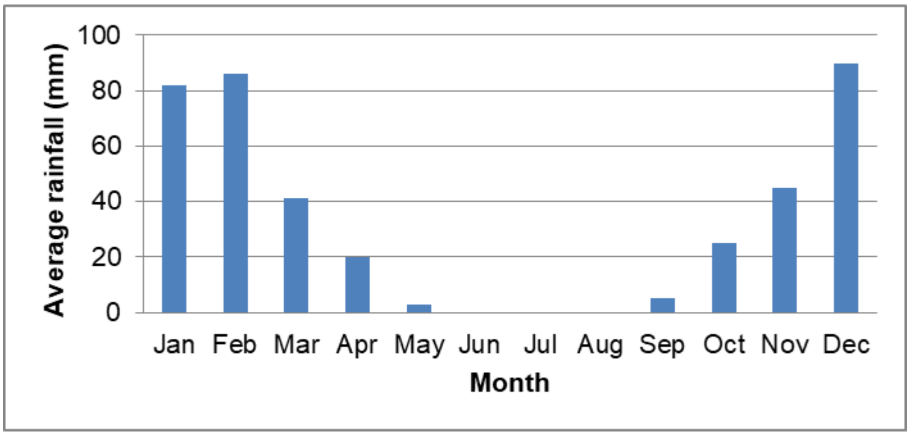

Figure 2.12: Mean annual rainfall of the Mopani Experimental Burn Plot, located within the north of the Kruger National Park (Mucina & Rutherford, 2006:482).

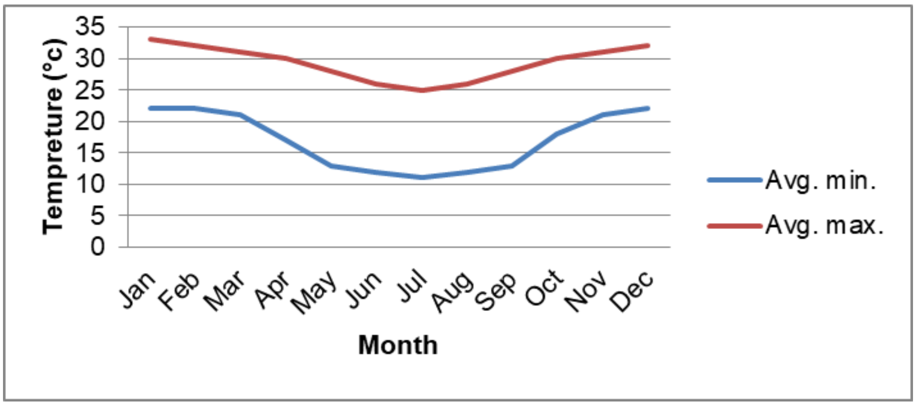

Figure 2.13: Mean minimum and maximum monthly temperatures for the Mopani Experimental Burn Plot, located in the north of the Kruger National Park (Mucina & Rutherford, 2006:482).

The landscape was described by Mucina & Rutherford (2006:486) as plains with medium to low shrubs ranging from one to two meters, dominated by multi-stemmed *Colophospermum mopane*. Important large shrubs include: *Colophospermum mopane, Combretum hereroense* and *Flueggea virosa* whereas important small shrubs include: *Dicoma tomentosa* and *Clerodendrum ternatum* (Mucina & Rutherford, 2006:486).

The geology of the EBP is described as Basalt (Mucina & Rutherford, 2006:486). Dominant soils forms are Maya, Milkwood and Bonheim (Venter & Govender, 2012:7).

CHAPTER 3: METHODS

3.1 Rationale for methodology used

Plot sampling is defined by Mueller-Dombois & Ellenberg (1974:47) as a sampling unit which consists of a measurable area and examples include belt transects and quadrats. Plotless sampling is defined by Panagos (1995:27) as sampling units with insignificant or no area and examples include point sampling and line intercept sampling.

Biggs, *et al*. (2003:1-15) provided a comprehensive background on sampling and analysing strategies which should be considered when sampling within the Experimental Burn Plots (EBP). This allowed studies (Higgins, *et al*. 2007:1119-1125; Devine, *et al*. 2007:179-192) conducted on the woody component of the EBP's to have a guideline for woody surveys. The previously mentioned studies of Van der Schijff (1958:60-93); Enslin, *et al*. (2000:27-37); Kennedy & Potgieter, (2003:179-192); Higgins, *et al*. (2007:1119-1125); and Devine, *et al*. (2015:473-478), all utilized various-sized belt transects to conduct their woody vegetation sampling. The variation in size of these transects was attributed to the objectives of each study.

For this study, the most important measurable vegetation attributes included the species present; vegetation structure (represented by growth form and mean canopy cover); and mean density (referred to as the number of individuals per unit area) (Panagos, 1995:27). Belt transects allowed for all rooted species to be identified and recorded, woody structural height classes assigned and canopy cover estimated. The use of belt transects also minimized edge effect caused by the close proximity of the treatment plots to other treatment plots as well as fire breaks.

Several studies (Du Toit, 1990:58; Spencer, 1995:450; Breebart, 2000:70; Stokke & Du Toit, 2000:76-77; Bothma, Van Rooyen & Du Toit, 2010:227-229; Pienaar & Du Toit, 2010:263; O'Kane, *et al*. 2011:254; Apps, 2012:252 & 261) compared the different woody height classes utilised by different browsers (Table 5.1), they were considered when choosing the height classes utilized for this study.

3.2 Infield method

The field sampling was conducted over two growing seasons, with the Pretoriuskop and Skukuza EBP's surveyed from February 2017 to March 2017; and the Satara and Mopani EBP's surveyed from February 2018 to March 2018.

3.2.1 Study sites and replicates surveyed

The study sites compromised of the four EBP's namely the Pretoriuskop-; Skukuza-; Satara- and Mopani EBP's. Biggs, *et al.* (2003:4) defined a treatment plot as the smallest unit which can be measured, approximately seven hectares in size and protected by a double fire break. A replicate was defined by Biggs, *et al.* (2003:4) as a series of abutting treatments numbering between 12 to 14 plots. Each EBP has a total of four replicates.

Research conducted by Venter & Govender (2012:1-10) ranked the four replicates within the four study sites according to geomorphology and soil type, this resulted in one replicate from each study site being excluded from this study. The excluded replicates include the Fayi replicate (located in the Pretoriuskop EBP) (Figure 3.1); Mbyamiti replicate (located in the Skukuza EBP) (Figure 3.2); Lindanda replicate (located in the Satara EBP) (Figure 3.3); and the Nshawo replicate (located in Mopani EBP) (Figure 3.4). The remaining three replicates were sampled at each of the four EBP sites, thus 12 treatments in total for each EBP (Figure 2.1). Replicates that were sampled are summarized in Table 3.1.

Table 3.1: The Experiential Burn Plots (EBP's) with replicates sampled within the Kruger National Park

EBP	**Replicates sampled**
Pretoriuskop	Numbi Kambeni Shabeni
Skukuza	Skukuza Napi N'waswitshaka
Satara	Satara Marheya Nwanetsi
Mopani	Tesende Mooiplass Dzombo

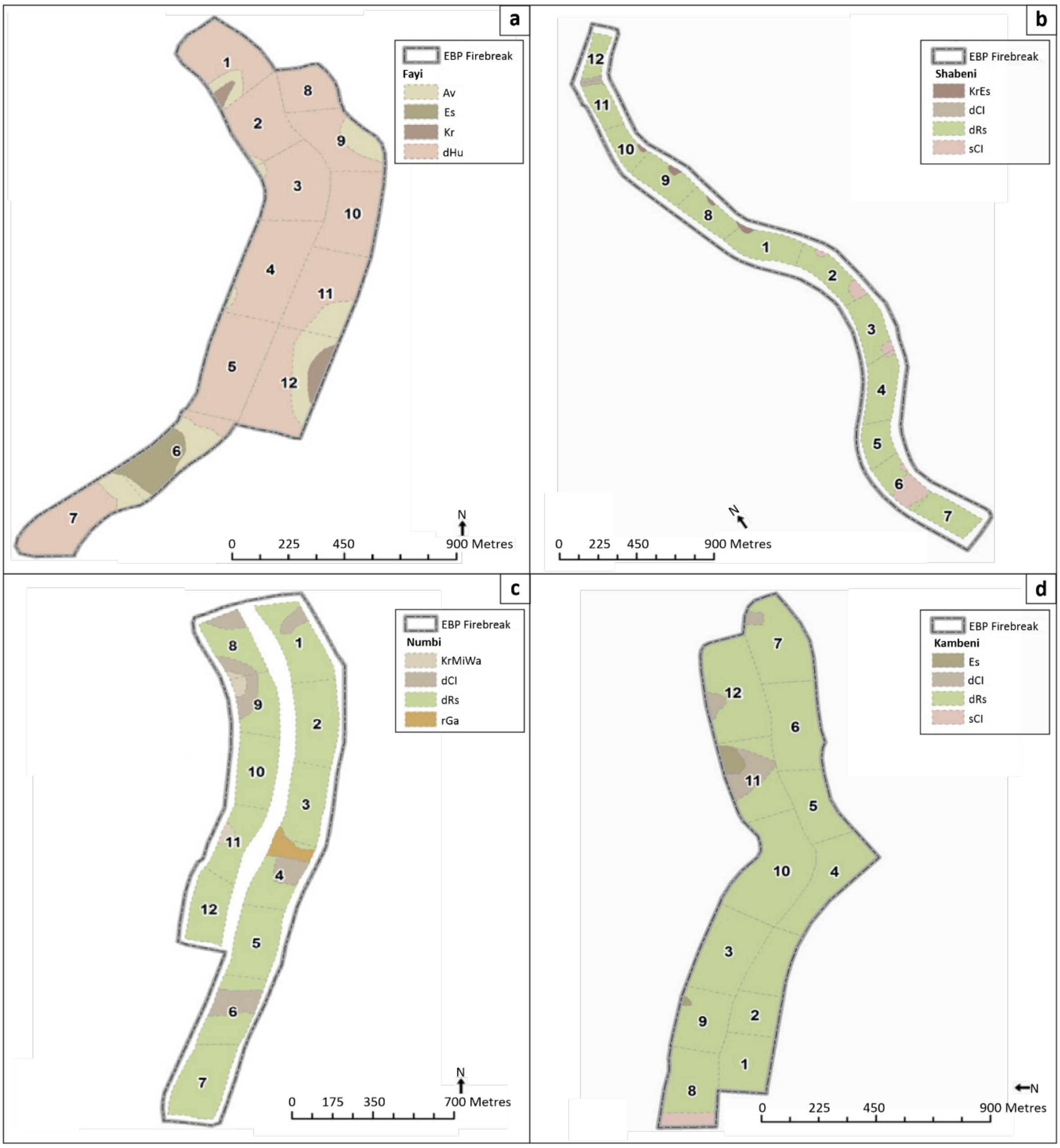

Figure 3.1: The replicates of the Pretoriuskop Experimental Burn Plot, Kruger National Park. The replicates consist of Fayi (a) (excluded from the study); Shabeni (b); Numbi (c); and Kambeni (d) (Venter & Govender, 2012:5).

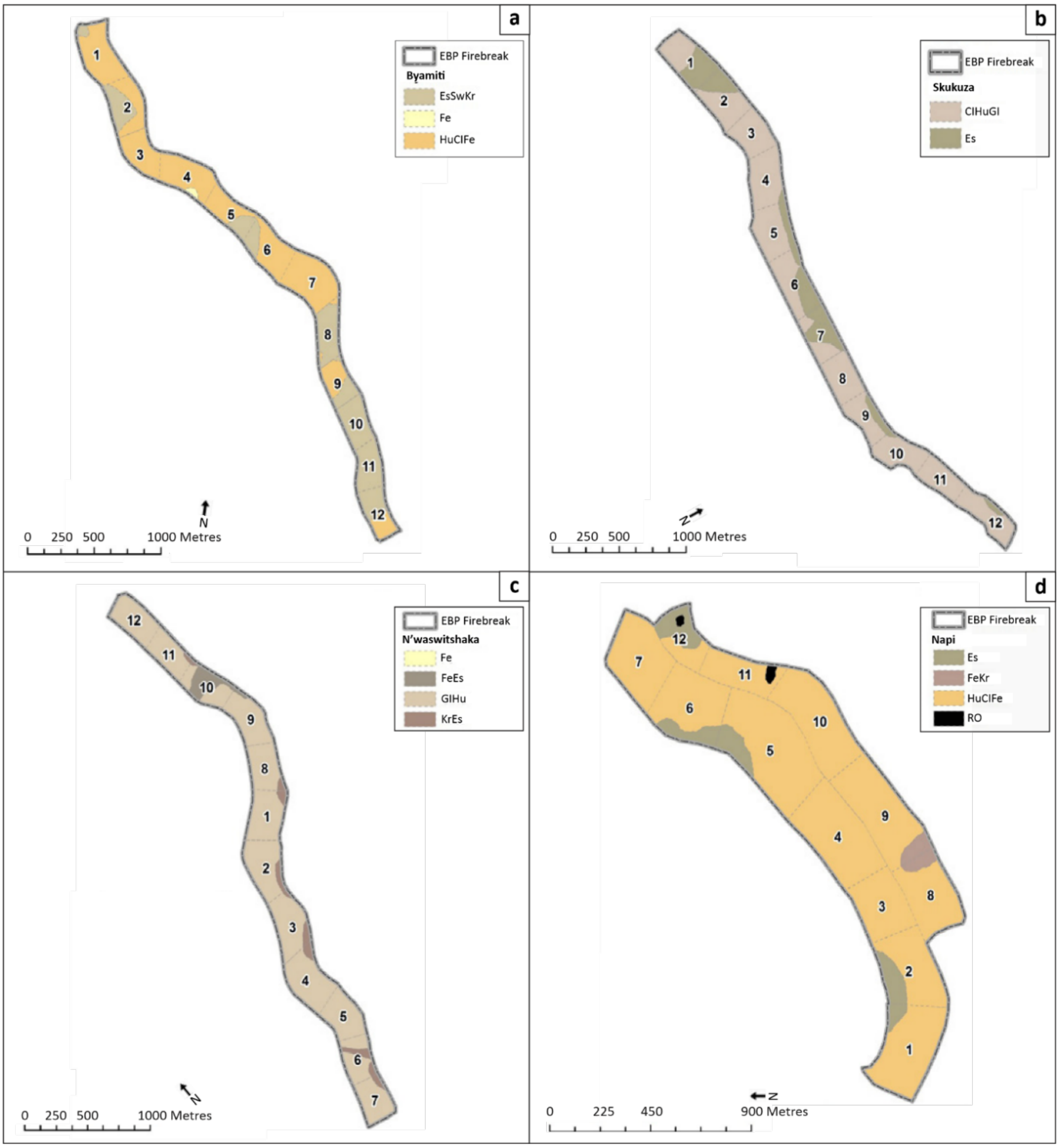

Figure 3.2: The replicates of the Skukuza Experimental Burn Plot, Kruger National Park. The replicates consist of Biyamiti (a) (excluded from this study); Skukuza (b); N'waswitshaka (c); and Napi (d) (Venter & Govender, 2012:6).

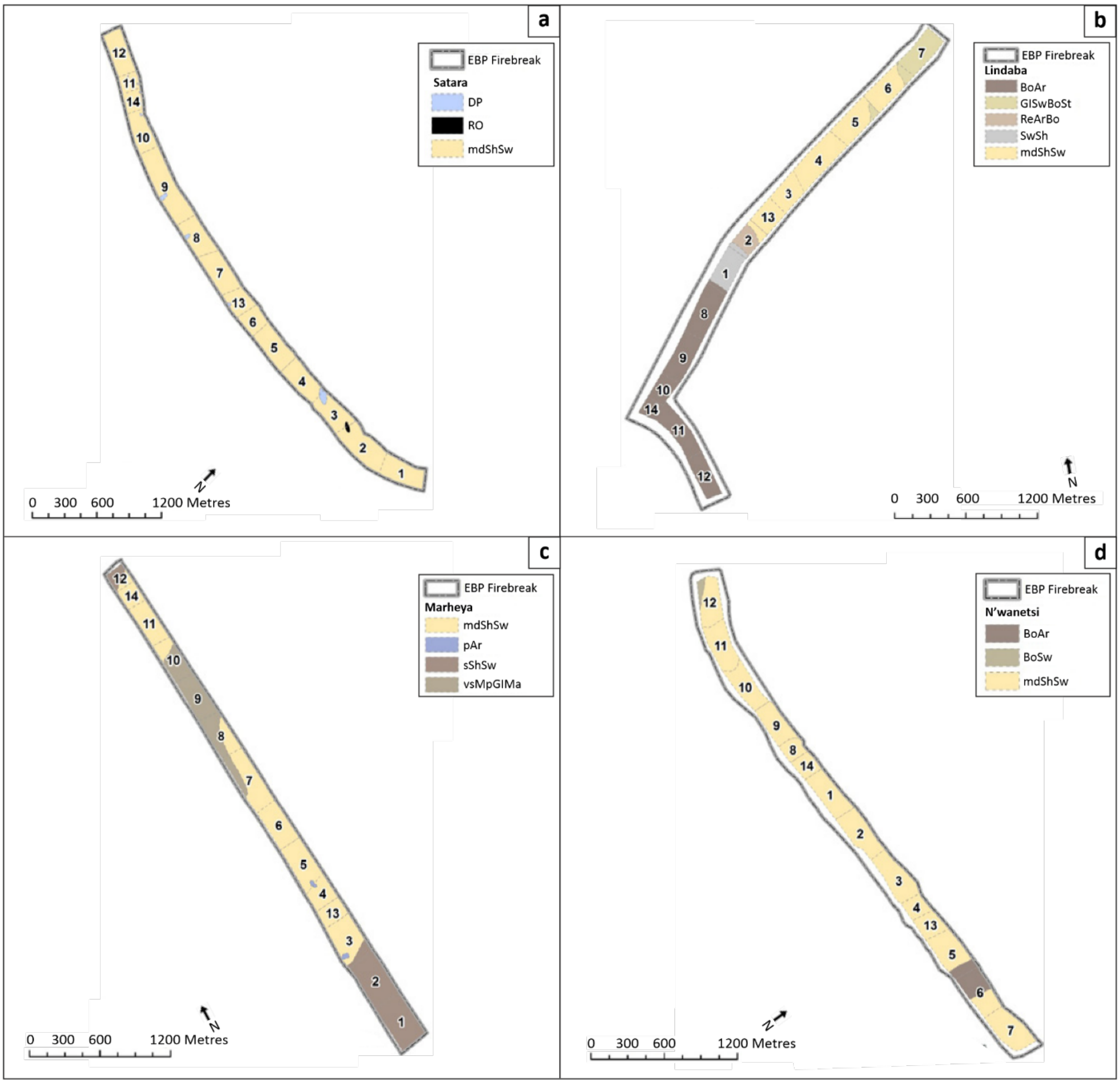

Figure 3.3: The replicates of the Satara Experimental Burn Plot, Kruger National Park. The replicates consist of Satara (a); Lindanda (b) (excluded from this study); Marheya (c); and Nwanetsi (d) (Venter & Govender, 2012:8).

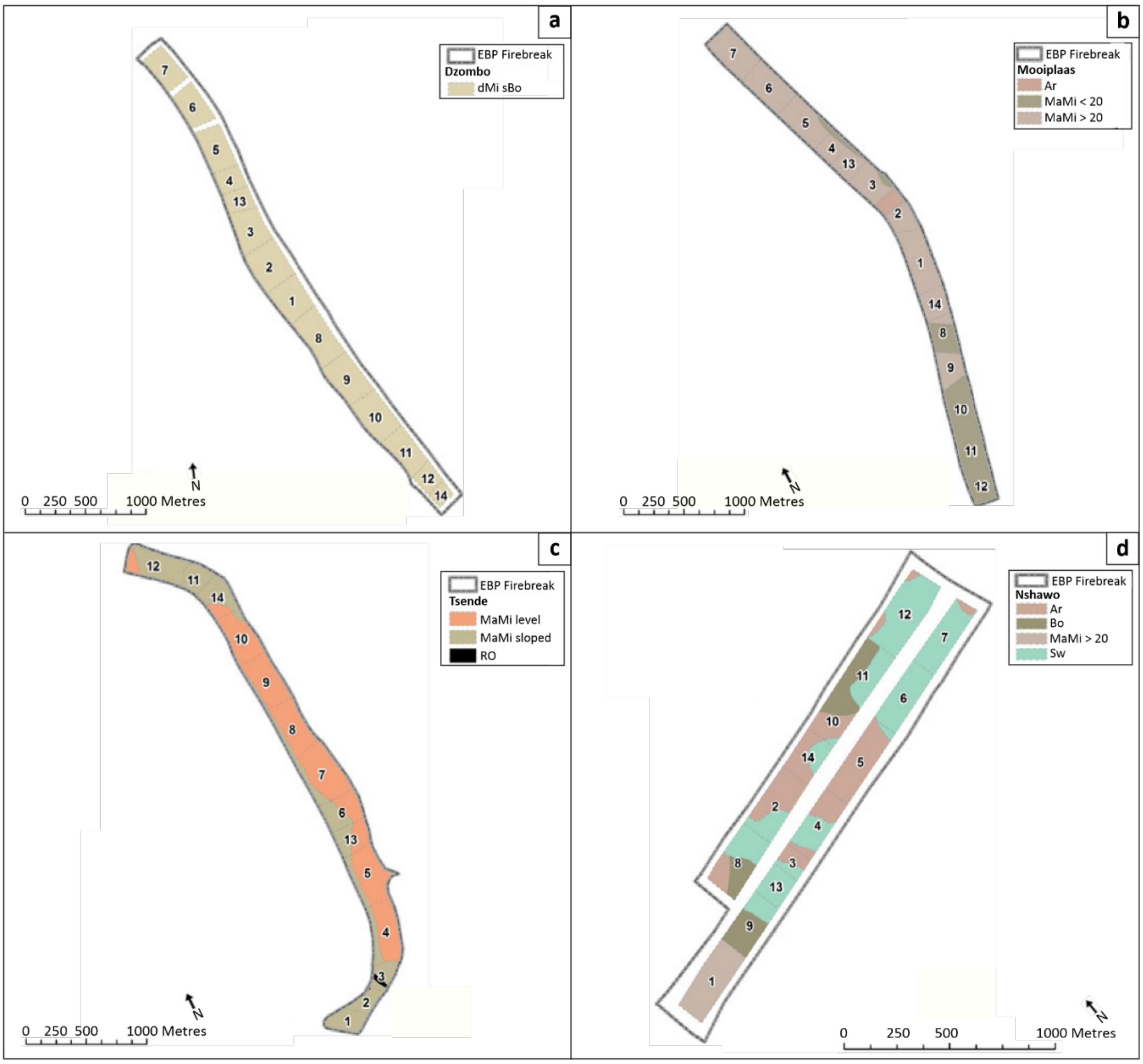

Figure 3.4: The replicates of the Mopani Experimental Burn Plot, Kruger National Park. These replicates consist of Dzombo (a); Mooiplaas (b); Tsende (c); and Nshawo (d) (excluded from the study) (Venter & Govender, 2012:9).

3.2.2 Treatments selected for surveying and dimensions of belt transects used

Within each replicate, four treatments were surveyed. A treatment was defined by Biggs, *et al.* (2003:4) as a combination of fire frequency and season (e.g. triennial burn in February) which is applied to a specific 7 ha plot. The treatments selected for this study include: no burn (control); a triennial winter burn; a triennial summer burn; and an annual seasonal (winter) burn. The triennial winter burn was selected as it is the baseline to which the burns in the KNP are currently conducted, thus burning in a three-year cycle in August (Pellegrini, *et al*. 2017:112). The annual burn was selected as there is an increase in the fire frequency in comparison to the baseline (Pellegrini, *et al*. 2017:112). These treatments were also selected as per recommendation from the fire ecologist, at the time, Ms. N. Govender *pers. comm.*[1]

Following Van der Schijff (1958:60-93); Enslin, *et al*. (2000:27-37); Kennedy & Potgieter (2003:179-192); Higgins, *et al*. (2007:1119-1125); and Devine, *et al*. (2015:473-478), belt transects of 10 m x 100 m (1 000 m²) were used in this study (Figure 3.5). The belt transects were placed centrally in the treatment plots and perpendicular to any slope. Sampling up or down any slope improves sampling efficiency in terms of the number of species recorded (Markham & Babbedge, 1979:225). Where the configuration of the treatment plot was such that the downslope side of the plot was narrower than the longer side of the plot running parallel to the contour, then two parallel 10 m x 50 m belt transects, spaced 50 m apart were placed centrally in the treatment plot.

This method was used to avoid sampling the edge effect of the fire breaks and the treatment plots. Each belt thus covered an area of 0.1 ha. A total of forty-eight 1 000 m² belt transects were sampled for the whole study (four EBP's x 12 treatments), with a total area of 4.8 ha.

[1]Ms N. Govender, Senior Manager: Conservation management, South African National Parks, Scientific Services

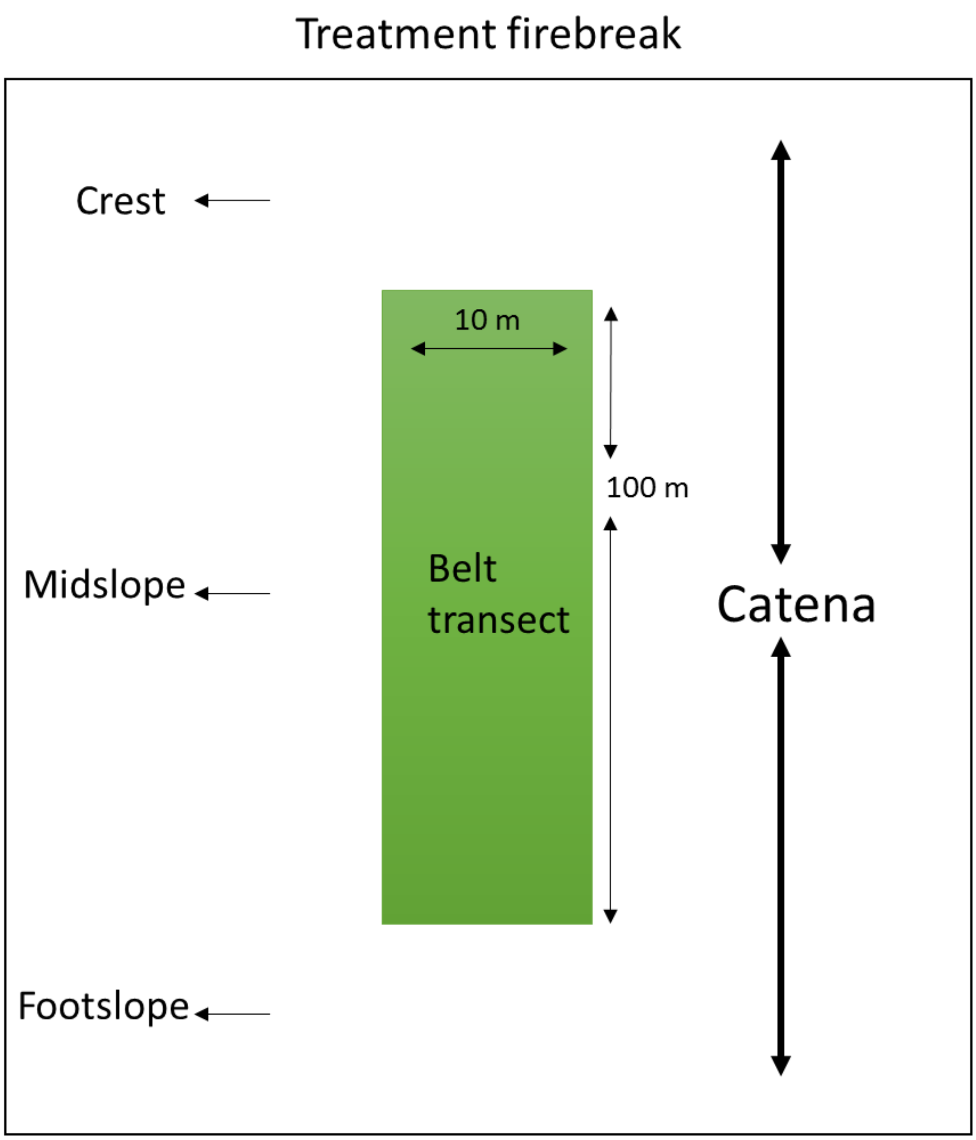

Figure 3.5: Layout diagram, adapted from Westfall (1992:24-34) of the placement of the 1 000 m^2 (10 m x 100 m) belt transect, within a sampled treatment, running up or down the catena.

3.2.3 Floristic data recorded

All rooted woody plant species within the belt transects were identified infield, using existing knowledge, with the aid of field guides, or if there was any doubt about the veracity of the identification, plants were collected, pressed and identified at the Skukuza herbarium. Plant names are all according to the Plants of southern Africa: an online checklist (version 3.0) managed by the South African National Biodiversity Institute, Pretoria, South Africa (2017/18).

The woody structural height classes (Table 3.2) used in this study followed the approaches used by Dayton (1978:67); Woolnough & Du Toit, (2001:587); Breebaart, Bhikraj & O'Connor (2002:17); Biggs, *et al*. (2003:5); and Makhabu (2005:642).

Table 3.2: The structural height classes assigned to each identified woody plant species, rooted within each sampled belt transect

Woody structural height class code	Description
D 0.5	Dwarf shrubs of 0 m - 0.5 m
D 1	Dwarf shrubs of >0.5 m - 1 m
S 1.5	Shrubs of >1 m - 1.5 m
S 2	Shrubs of >1.5 m - 2 m
T	Tree of >2 m

Mueller-Dombois & Ellenberg (1974:47) defined crown cover as the vertical projection of the crown of a species to the ground surface. The method used to determine crown cover was the Plant Number Scale (Westfall & Panagos 1988:289-291). This method is based on counting the number of individuals of each recorded species within a mini transect. The size of these mini transects is a function of the average crown size and spacing between crowns of individuals of the counted species.

3.3 Data analysis

Replicates of similar treatments of all four EBP's were compared in terms of dominance, woody structure and woody density. The data collected infield was analysed using PHYTOTAB – PC (Westfall, 1992:129; Westfall, Theron & Van Rooyen, 1997:299). The PHYTOTAB – PC software package was used to provide a forced classification of the floristic data collected in each treatment plot, in each replicate, at each of the four study sites. A forced classification was derived by arranging each treatment (i.e. August Triennial Burn in Pretoriuskop) as a community and listing each replicate (i.e. Numbi) occurring in that particular treatment as a relevé (i.e. Relevé 1).

The PHYTOTAB – PC (Westfall, 1992:129; Westfall, Theron & Van Rooyen, 1997:299) programme generates a number of output tables. The data analyses, includes amongst others, species composition in terms of frequency/cover; mean canopy cover per growth form; and mean density of plants for all woody species.

In the result tables only woody species with a mean canopy cover >0.4% were considered dominant with structure referring to the different growth forms and canopy cover assigned to the individual woody species. Mean woody densities were expressed as individuals per hectare, herewith stated as ind/ha, and arranged from the species with the highest mean densities to those with lower mean densities. Only woody species with a mean density >60 ind/ha were included. The cut-off of >0.4% (mean canopy cover) and >60 ind/ha (mean density) was put in place as any higher percentage or individuals per hectare would completely remove species in the Satara EBP, which would then result in treatments showing no data. This cut-off also allowed for the data to be manageable by reducing the number of woody species shown in tables and summaries. The within treatment analysis was followed with a between treatment analysis, also comparing mean canopy cover, woody structure and mean woody density. Linear trendlines were fitted in graphs to indicate an increase/decrease of mean cover and density.

Woody plant palatability was determined using work done by Mukinya (1977:128-130); Owen-Smith (1979:108); Owen-Smith & Cooper (1987:326-327); Furstenburg & van Hoven (1994:429); Wiseman, Page & O'Connor (2004:33); Hooimeijer, *et al*. (2005:96-97); Makhabu, *et al*. (2006:168); Fornara & du Toit (2008:543); Venter & Venter (2009:302-313); Kos, *et al*. (2012:283-285); and Gordijn, Rice & Ward (2012:411).

The data for this study, quantified with the Plant Number Scale (Westfall, 1992:129; Westfall, Theron & Van Rooyen, 1997:299), were found to have a Poisson distribution, skewed to the left by high frequencies of single and low counts of plants with dominant plants occurring at lower frequencies. Consequently, the Chi-square test was selected to analyze the data as it tests for association in the frequency of the means (Fowler, Cohen & Jarvis, 2009:111), statistical analysis was conducted on Microsoft Excel 2019. A post-hoc test was not conducted as the Chi-square test is a non-parametric test and with the data being a count ANOVA could not be used.

CHAPTER 4: RESULTS

4.1 Dominance, structure, and density of woody species recorded in the Experimental Burn Plots

The data analyses for the four Experimental Burn Plots (EBP's) are presented following the rainfall gradient in the Kruger National Park (KNP), starting with the high rainfall region in the south (Pretoriuskop and Skukuza) to the low rainfall region in the centre and north (Satara and Mopane).

Within- and between-treatment findings are presented for each EBP and the sequence in which the treatments are arranged is according to fire intensity from low to high, i.e. No Burn, February Triennial Burn, August Triennial Burn and August Annual Burn.

The detailed data generated using PHYTOTAB-PC (Westfall, 1992:129; Westfall, Theron & Van Rooyen, 1997:299) for each of the EBP's is provided in the appendices and the end of the thesis.

4.1.1 Pretoriuskop Experimental Burn Plot

4.1.1.1 Within-treatment analysis

<u>Treatment: No Burn</u>

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the No Burn treatments at the Pretoriuskop EBP are given in Table 4.1. The mean woody densities of the species in each of the five height classes are presented in Table 4.2.

Table 4.1: Mean canopy cover (%) of the dominant woody species in the No Burn treatments within the surveyed replicates, Pretoriuskop EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Num[1]	Sha[2]	Kha[3]	
D0.5	*Terminalia sericea*	0.1	1.6	0.9	0.9
	Dichrostachys cinerea	0.9	0.4	0.9	0.7
	Cassia abbreviata subsp. *beareana*	0.4	0.4	-	0.3
	Euclea divinorum	0.4	0.1	-	0.2
	Flueggea virosa subsp. *virosa*	0.4	0.1	-	0.2
	Gymnosporia buxifolia	-	0.1	0.4	0.2
	Euclea natalensis subsp. *angustifolia*	-	-	0.4	0.1
D1	*Terminalia sericea*	1.6	1.6	-	1.1
	Dichrostachys cinerea	0.4	0.4	0.9	0.6
	Pavetta schumanniana	0.9	-	-	0.3
	Gymnosporia buxifolia	0.1	0.1	0.4	0.2
	Dalbergia melanoxylon	0.1	0.4	0.1	0.2
	Euclea divinorum	0.4	0.1	0.1	0.2
	Flueggea virosa subsp. *virosa*	0.4	0.1	0.1	0.2
	Cassia abbreviata subsp. *beareana*	0.4	0.1	-	0.2
	Psydrax locuples	0.4	0.1	-	0.2
	Antidesma venosum	0.4	-	-	0.1
	Diospyros mespiliformis	0.4	-	-	0.1
	Zanthoxylum humile	0.4	-	-	0.1
S1.5	*Euclea natalensis* subsp. *angustifolia*	6.5	0.1	0.4	2.3
	Dichrostachys cinerea	0.9	2.5	0.9	1.4
	Terminalia sericea	2.5	0.1	0.9	1.2
	Diospyros mespiliformis	1.6	-	0.1	0.6
	Dalbergia melanoxylon	0.1	0.4	0.1	0.2
	Euclea divinorum	0.4	0.1	0.1	0.2
	Flueggea virosa subsp. *virosa*	0.4	0.1	0.1	0.2
	Gymnosporia buxifolia	0.1	0.1	0.4	0.2
	Psydrax locuples	0.4	0.1	0.1	0.2
	Zanthoxylum humile	0.4	-	0.1	0.2
	Olea europaea subsp. *cuspidata*	0.4	-	-	0.1
	Rhoicissus tridentata subsp. *cuneifolia*	0.4	-	-	0.1

S2	*Terminalia sericea*	4.9	1.6	3.6	3.4
	Dichrostachys cinerea	0.9	2.5	0.9	1.4
	Gymnosporia buxifolia	-	0.1	3.6	1.2
	Diospyros mespiliformis	1.6	-	-	0.5
	Euclea divinorum	0.4	0.1	0.1	0.2
	Psydrax locuples	0.4	-	0.1	0.2
	Antidesma venosum	0.4	-	-	0.1
	Dalbergia melanoxylon	-	0.4	-	0.1
	Euclea natalensis subsp. *angustifolia*	-	-	0.4	0.1
	Jasminum fluminense	0.4	-	-	0.1
	Olea europaea subsp. *cuspidata*	0.4	-	-	0.1
T	*Terminalia sericea*	6.5	14.5	14.5	11.8
	Dichrostachys cinerea	-	1.6	3.6	1.7
	Antidesma venosum	0.1	1.6	0.1	0.6
	Gymnosporia buxifolia	-	0.1	1.6	0.6
	Olea europaea subsp. *cuspidata*	0.4	0.9	-	0.4
	Sclerocarya birrea subsp. *caffra*	0.4	0.1	0.4	0.3
	Euclea divinorum	0.4	0.1	0.1	0.2
	Euclea natalensis subsp. *angustifolia*	-	0.1	0.4	0.2
	Philenoptera violacea	-	-	0.4	0.1

[1]Numbi replicate, [2]Shabeni replicate, [3]Khambeni replicate

There are statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 13.8$, $p < 0.05$ at 4 degrees of freedom (df).

Table 4.2: Mean woody densities (ind/ha) of the surveyed replicates, representing the No Burn treatment, Pretoriuskop EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Num[1]	Sha[2]	Kha[3]	
D0.5	*Terminalia sericea*	23	981	81	362
	Dichrostachys cinerea	211	243	211	222
	Lantana camara	440	-	-	147
	Cassia abbreviata subsp. *beareana*	93	243	-	112
	Euclea divinorum	93	60	-	51
	Gymnosporia buxifolia	-	60	93	51
	Flueggea virosa subsp. *virosa*	93	23	-	39
	Dalbergia melanoxylon	23	60	23	35
	Euclea natalensis subsp. *angustifolia*	-	-	93	31
	Catunaregam spinosa	23	60	-	28
	Solanum panduriforme	-	60	23	28
D1	*Terminalia sericea*	374	144	81	200
	Dichrostachys cinerea	93	35	211	113
	Dalbergia melanoxylon	23	243	23	96
	Gymnosporia buxifolia	23	60	93	59
	Psydrax locuples	93	23	23	46
	Euclea divinorum	93	23	8	41
	Euclea natalensis subsp. *angustifolia*	23	-	93	39
	Antidesma venosum	93		-	31
	Cassia abbreviata subsp. *beareana*	93	-	-	31
	Diospyros mespiliformis	93	-	-	31
	Zanthoxylum humile	93	-	-	31
	Pavetta schumanniana	81	-	-	27
	Searsia gueinzii	-	60	-	20
S1.5	*Terminalia sericea*	585	8	31	208
	Euclea natalensis subsp. *angustifolia*	579	8	13	200
	Dichrostachys cinerea	81	226	81	129
	Diospyros mespiliformis	144	-	8	51
	Zanthoxylum humile	93	-	23	38
	Psydrax locuples	93	8	8	36
	Dalbergia melanoxylon	3	93	8	35

S2	*Terminalia sericea*	444	144	326	305
	Dichrostachys cinerea	211	226	81	173
	Gymnosporia buxifolia	-	8	326	111
	Diospyros mespiliformis	144	-	-	48
	Psydrax locuples	93	-	23	39
	Dalbergia melanoxylon	-	93	-	31
	Jasminum fluminense	93	-	-	31
T	*Terminalia sericea*	220	188	71	160
	Dichrostachys cinerea	-	55	326	127
	Gymnosporia buxifolia	-	1	144	48

[1]Numbi replicate, [2]Shabeni replicate, [3]Khambeni replicate

There are statistically significant differences between the mean densities of the five different height classes, $X^2 = 375.7$, $p < 0.05$ at 4 degrees of freedom (df).

Treatment: February Triennial Burn

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the February Triennial Burn treatment at the Pretoriuskop EBP are given in Table 4.3. The mean woody densities of the species in each of the five height classes are presented in Table 4.4.

Table 4.3: Mean canopy cover (%) of the dominant woody species in the February Triennial Burn within the surveyed replicates, Pretoriuskop EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Num[1]	Sha[2]	Kha[3]	
D0.5	*Terminalia sericea*	0.4	0.9	3.6	1.6
	Dichrostachys cinerea	0.4	0.4	0.4	0.4
	Solanum panduriforme	0.4	0.4	0.1	0.3
	Gymnosporia buxifolia	0.4	0.1	0.1	0.2
	Combretum collinum subsp. *gazense*	-	0.4	0.1	0.2
	Parinari curatellifolia	-	0.1	0.4	0.2
	Strychnos madagascariensis	-	0.4	-	0.1
D1	*Terminalia sericea*	0.4	0.9	3.6	0.7
	Dichrostachys cinerea	0.4	0.4	0.4	0.4
	Gymnosporia buxifolia	0.4	0.1	0.1	0.2
	Parinari curatellifolia	0.1	-	0.4	0.2
	Solanum panduriforme	0.4	-	-	0.1
S1.5	*Terminalia sericea*	0.9	0.9	3.6	1.7
	Dichrostachys cinerea	0.4	0.9	0.9	0.7
	Euclea divinorum	0.4	0.1	-	0.2
	Gymnosporia buxifolia	-	0.4	0.1	0.2
	Searsia gueinzii	0.4	-	0.1	0.2
S2	*Terminalia sericea*	4.9	0.9	14.5	6.8
	Dichrostachys cinerea	0.9	0.9	0.9	0.9
	Euclea divinorum	0.4	0.1	0.4	0.3
	Gymnosporia buxifolia	0.4	0.4	-	0.3
T	*Terminalia sericea*	4.9	4.9	14.5	8.1
	Dichrostachys cinerea	0.9	2.5	0.9	1.4
	Combretum collinum subsp. *gazense*	-	3.6	-	1.2
	Sclerocarya birrea subsp. *caffra*	0.4	0.4	0.4	0.4
	Euclea divinorum	0.4	0.1	0.4	0.3
	Searsia pyroides var. *pyroides*	0.1	0.1	0.4	0.2
	Gymnosporia buxifolia	0.4	0.1	0.1	0.2

[1]Numbi replicate, [2]Shabeni replicate, [3]Khambeni replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 4.6$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.4: Mean woody densities (ind/ha) of the surveyed replicates, representing the February Triennial Burn, Pretoriuskop EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Num[1]	Sha[2]	Kha[3]	
D0.5	*Terminalia sericea*	93	211	844	383
	Gymnosporia buxifolia	243	60	23	109
	Dichrostachys cinerea	93	93	93	93
	Strychnos madagascariensis	-	243	23	89
	Solanum panduriforme	93	93	23	70
	Sclerocarya birrea subsp. *caffra*	23	160	-	61
	Rhoicissus tridentata subsp. *cuneifolia*	160	-	-	53
	Parinari curatellifolia	-	60	93	51
	Combretum collinum subsp. *gazense*	-	93	23	39
	Dalbergia melanoxylon	60	23	23	35
	Pavetta schumanniana	-	60	23	28
	Ziziphus mucronata	60	8	-	23
	Flueggea virosa subsp. *virosa*	-	60	-	20
	Vachellia exuvialis	60	-	-	20
D1	*Terminalia sericea*	35	81	326	147
	Dichrostachys cinerea	93	93	93	93
	Gymnosporia buxifolia	93	23	23	46
	Solanum panduriforme	93	-	23	39
	Dalbergia melanoxylon	23	60	23	35
	Vachellia exuvialis	60	-	23	28
	Searsia gueinzii	-	60	8	23
S1.5	*Terminalia sericea*	81	81	326	163
	Dichrostachys cinerea	35	81	81	66
	Gymnosporia buxifolia	-	93	23	39
	Strychnos madagascariensis	-	23	60	28
S2	*Terminalia sericea*	444	81	1304	607
	Dichrostachys cinerea	81	211	81	124
T	*Dichrostachys cinerea*	81	86	4	57
	Terminalia sericea	24	64	71	53

[1]Numbi replicate, [2]Shabeni replicate, [3]Khambeni replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 892.3$, $p < 0.05$ at 4 degrees of freedom (df).

Treatment: August Triennial Burn

Dominant woody species, mean canopy covers and mean woody densities of the different growth forms and height classes, of the August Triennial Burn at the Pretoriuskop EBP are given in Tables 4.5 and 4.6.

Table 4.5: Mean canopy cover (%) of the dominant woody species in the August Triennial Burn within the surveyed replicates, Pretoriuskop EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Num[1]	Sha[2]	Kha[3]	
D0.5	*Dichrostachys cinerea*	1.6	0.9	1.6	1.4
	Terminalia sericea	0.4	2.5	0.9	1.3
	Grewia bicolor	0.1	-	1.6	0.6
	Cassia abbreviata subsp. *beareana*	1.6	-	-	0.5
D1	*Dichrostachys cinerea*	1.6	0.9	6.5	3
	Terminalia sericea	0.9	2.5	0.9	1.4
	Cassia abbreviata subsp. *beareana*	1.6	0.1	-	0.6
	Euclea natalensis subsp. *angustifolia*	-	-	0.9	0.3
	Parinari curatellifolia	0.4	-	-	0.1
	Philenoptera violacea	-	0.4	-	0.1
S1.5	*Terminalia sericea*	2.5	2.5	3.6	2.9
	Dichrostachys cinerea	2.5	3.6	1.6	2.6
	Euclea natalensis subsp. *angustifolia*	-	-	3.6	1.2
	Euclea divinorum	-	0.1	0.9	0.3
	Parinari curatellifolia	0.4	-	-	0.1
S2	*Dichrostachys cinerea*	2.5	3.6	1.6	2.6
	Terminalia sericea	2.5	-	-	0.8
T	*Terminalia sericea*	3.6	10.1	0.9	4.9
	Dichrostachys cinerea	0.4	0.4	6.5	2.4
	Sclerocarya birrea subsp. *caffra*	2.5	-	0.4	1
	Grewia bicolor	-	-	1.6	0.5
	Euclea divinorum	0.1	-	0.9	0.3
	Euclea natalensis subsp. *angustifolia*	-	-	0.9	0.3
	Philenoptera violacea	-	0.4	-	0.1

[1]Numbi replicate, [2]Shabeni replicate, [3]Khambeni replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 9.9$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.6: Mean woody densities (ind/ha) of the surveyed replicates, representing the August Triennial Burn, Pretoriuskop EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Num[1]	Sha[2]	Kha[3]	
D0.5	*Terminalia sericea*	243	226	554	341
	Dichrostachys cinerea	374	211	374	320
	Strychnos madagascariensis	23	60	-	28
	Gymnosporia buxifolia	3	-	60	21
	Antidesma venosum	-	-	60	20
	Solanum panduriforme	-	-	60	20
	Ziziphus mucronata	-	60	-	20
D1	*Terminalia sericea*	81	226	554	287
	Dichrostachys cinerea	55	211	579	282
	Cassia abbreviata subsp. *beareana*	144	23	-	56
	Peltophorum africanum	-	93	-	31
	Euclea natalensis subsp. *angustifolia*	-	-	81	27
	Solanum panduriforme	-	-	60	20
S1.5	*Dichrostachys cinerea*	86	326	144	185
	Terminalia sericea	86	226	124	145
	Euclea natalensis subsp. *angustifolia*	-	-	326	109
	Euclea divinorum	-	8	81	30
S2	*Dichrostachys cinerea*	86	326	144	185
	Terminalia sericea	226	-	-	75
T	*Dichrostachys cinerea*	13	13	579	202
	Terminalia sericea	47	131	4	61

[1]Numbi replicate, [2]Shabeni replicate, [3]Khambeni replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 632.2$, $p < 0.05$ at 4 degrees of freedom (df).

Treatment: August Annual Burn

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the August Annual Burn at the Pretoriuskop EBP are given in Table 4.7. The mean woody densities of the species in each of the five height classes are presented in Table 4.8.

Table 4.7: Mean canopy cover (%) of the dominant woody species in the August Annual Burn within the surveyed replicates, Pretoriuskop EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Num[1]	Sha[2]	Kha[3]	
D0.5	*Dichrostachys cinerea*	2.52	1.61	3.63	2.6
	Terminalia sericea	0.91	1.61	2.52	1.7
	Combretum collinum subsp. *gazense*	1.61	-	-	0.5
	Cassia abbreviata subsp. *beareana*	0.4	0.91	-	0.4
	Pavetta schumanniana	0.4	0.1	-	0.2
	Solanum panduriforme	-	0.1	0.4	0.2
D1	*Dichrostachys cinerea*	2.52	1.61	3.63	2.6
	Terminalia sericea	0.4	1.61	2.52	1.5
	Cassia abbreviata subsp. *beareana*	0.4	0.91	-	0.4
	Pavetta schumanniana	0.4	0.1	-	0.2
	Solanum panduriforme	-	-	0.4	0.1
S1.5	*Terminalia sericea*	0.91	6.45	2.52	3.3
	Dichrostachys cinerea	0.91	1.61	3.63	2.1
S2	*Terminalia sericea*	0.91	6.45	2.52	3.3
	Dichrostachys cinerea	0.91	2.52	3.63	2.6
T	*Terminalia sericea*	6.45	3.63	2.52	4.2
	Dichrostachys cinerea	2.52	2.52	3.63	2.9
	Sclerocarya birrea subsp. *caffra*	0.1	-	1.16	0.4

[1]Numbi replicate, [2]Shabeni replicate, [3]Khambeni replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 9.5$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.8: Mean woody densities (ind/ha) of the surveyed replicates, representing the August Annual Burn, Pretoriuskop EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Num[1]	Sha[2]	Kha[3]	
D0.5	*Dichrostachys cinerea*	226	981	844	684
	Terminalia sericea	211	144	226	194
	Cassia abbreviata subsp. *beareana*	93	211	-	101
	Pavetta schumanniana	93	60	-	51
	Combretum collinum subsp. *gazense*	144	-	-	48
	Solanum panduriforme	-	23	93	39
	Gymnosporia buxifolia	23	23	60	35
	Euclea divinorum	23	60	-	28
	Philenoptera violacea	23	60	-	28
	Combretum molle	8	-	60	23
	Catunaregam spinosa	-	60	-	20
D1	*Dichrostachys cinerea*	226	144	844	405
	Terminalia sericea	35	144	226	135
	Cassia abbreviata subsp. *beareana*	93	81	-	58
	Solanum panduriforme	-	-	93	31
	Lantana camara	-	-	60	20
	Strychnos madagascariensis	-	60	-	20
S1.5	*Terminalia sericea*	81	220	226	176
	Dichrostachys cinerea	81	144	124	116
S2	*Dichrostachys cinerea*	81	226	326	211
	Terminalia sericea	81	220	226	176
T	*Dichrostachys cinerea*	226	86	326	213
	Terminalia sericea	220	47	12	93

[1]Numbi replicate, [2]Shabeni replicate, [3]Khambeni replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 974$, $p < 0.05$ at 4 degrees of freedom (df).

4.1.1.2 Between-treatment analysis

A comparison of the mean canopy cover of the different growth forms and height classes between the various treatments are given in Figure 4.1. The mean woody densities of the different treatments are summarized in Table 4.2 (No Burn); Table 4.4 (February Triennial Burn); Table 4.6 (August Triennial Burn); and Table 4.8 (August Annual Burn). A comparison of the mean densities of the different growth forms and height classes between the various treatments are given in Figure 4.2.

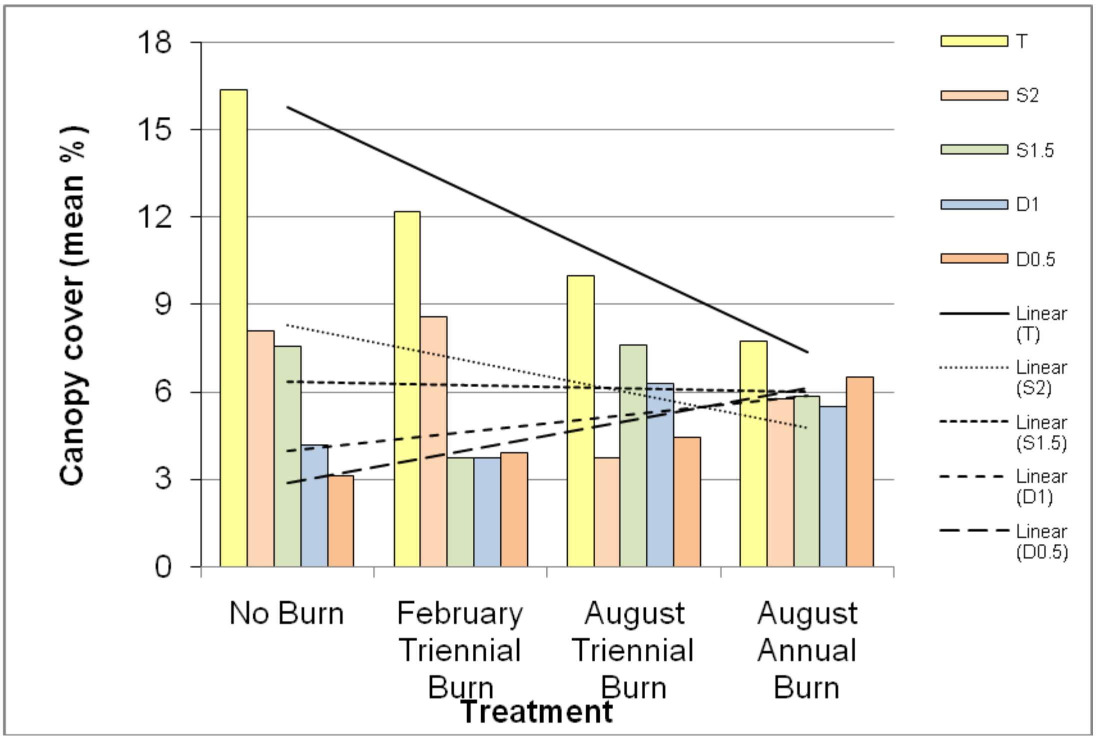

Figure 4.1: The mean canopy cover (%) in each woody height class for each treatment, located in the Pretoriuskop EBP, Kruger National Park.

The total mean woody canopy cover for each treatment in the Pretoriuskop EBP are the following: No Burn treatment, 39.4%; February Triennial Burn, 32.2%; August Triennial Burn, 31.5%; and August Annual Burn, 32.2%.

There are no statistically significant differences between the mean canopy cover of the four treatments within the different height classes: D0.5 - X^2 = 9.7, $p > 0.05$ at 3 degrees of freedom (df); D1 - X^2 = 10.3, $p > 0.05$ at 3 df; S1.5 - X^2 = 8.8, $p > 0.05$ at 3 df; S2 - X^2 = 8.8, $p > 0.05$ at 3 df; and T - X^2 = 10, $p > 0.05$ at 3 df.

There are no statistically significant differences between the total mean canopy cover of the four treatments: X^2 = 8.5, $p > 0.05$ at 3 degrees of freedom (df).

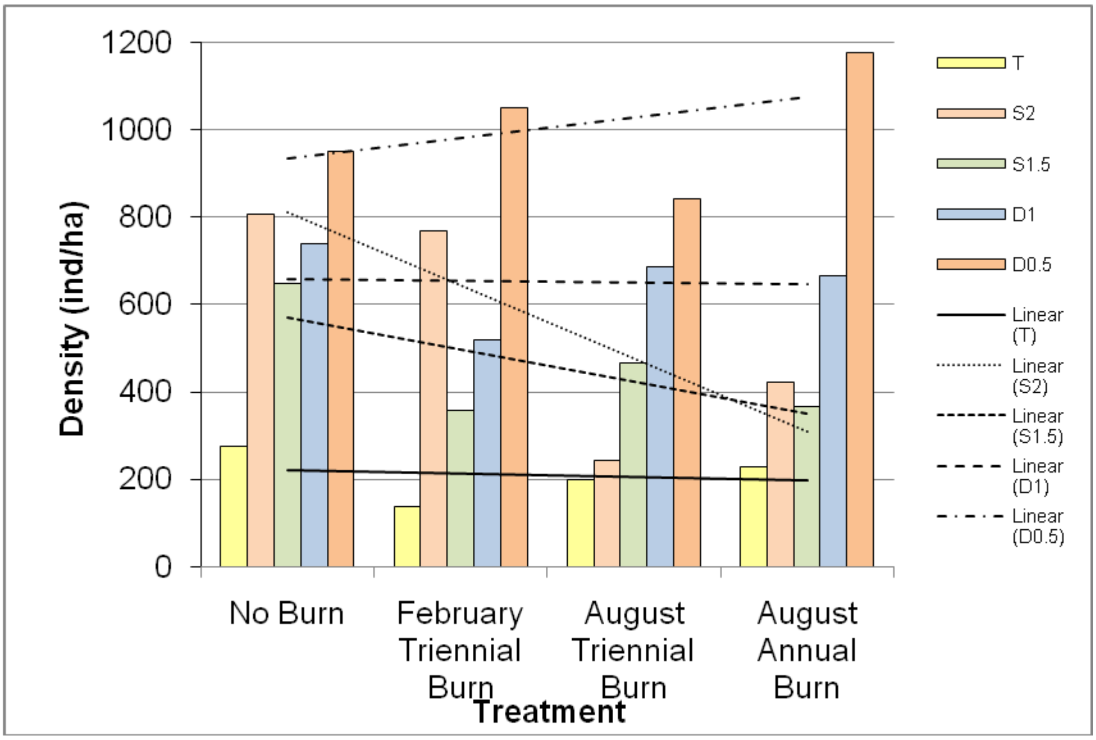

Figure 4.2: The mean density (ind/ha), in each woody height class for each treatment located in the Pretoriuskop EBP, Kruger National Park.

The total mean woody densities for each treatment in the Pretoriuskop EBP are the following: No Burn treatment, 3 422 ind/ha; February Triennial Burn, 2 840 ind/ha; August Triennial Burn, 2 441 ind/ha; and August Annual Burn, 2 863 ind/ha.

There are statistically significant differences between the densities of the four treatments within the following height classes: D0.5 - $X^2 = 60.6$, $p < 0.05$ at 3 degrees of freedom (df); D1 - $X^2 = 40.5$, $p < 0.05$ at 3 df; S1.5 - $X^2 = 117.6$, $p < 0.05$ at 3 df; S2 - $X^2 = 398.7$, $p < 0.05$ at 3 df; and T - $X^2 = 48.7$, $p < 0.05$ at 3 df.

There are statistically significant differences between the total mean densities of the four treatments: $X^2 = 168.7$, $p < 0.05$ at 3 degrees of freedom (df).

4.1.2 Skukuza Experimental Burn Plot

4.1.2.1 Within-treatment analysis

Treatment: No Burn

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the No Burn treatments at the Skukuza EBP are given in Table 4.9. The mean woody densities of the species in each of the five height classes are presented in Table 4.10.

Table 4.9: Mean canopy cover (%) of the dominant woody species in the No Burn treatment within the surveyed replicates, Skukuza EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean Canopy cover (%)
		Sku[1]	Napi	N'wa[2]	
D0.5	*Dichrostachys cinerea*	0.1	0.4	0.4	0.3
	Grewia flavescens	0.1	-	0.4	0.2
	Solanum lichtensteinii	-	0.4	0.1	0.2
	Strychnos madagascariensis	-	0.4	0.1	0.2
	Sclerocarya birrea subsp. *caffra*	-	-	0.4	0.1
D1	*Dalbergia melanoxylon*	0.1	0.9	0.1	0.4
	Terminalia sericea	0.1	0.4	0.4	0.3
	Combretum apiculatum subsp. *apiculatum*	0.1	0.1	0.4	0.2
	Sclerocarya birrea subsp. *caffra*	0.1	-	0.4	0.2
	Dichrostachys cinerea	-	-	0.4	0.1
	Euclea divinorum	0.4	-	-	0.1
	Strychnos madagascariensis	-	0.4	-	0.1
S1.5	*Combretum apiculatum* subsp. *apiculatum*	-	1.6	0.4	0.7
	Grewia flavescens	0.9	0.1	-	0.3
	Combretum hereroense	0.9	-	-	0.3
	Vachellia exuvialis	-	0.9	-	0.3
	Dichrostachys cinerea	-	0.4	0.4	0.3
S2	*Euclea divinorum*	3.6	-	-	1.2
	Ximenia caffra	-	-	0.9	0.3
	Combretum apiculatum subsp. *apiculatum*	-	-	0.4	0.1
	Combretum collinum subsp. *gazense*	-	-	0.4	0.1
	Dichrostachys cinerea	-	0.4	-	0.1

T	*Terminalia sericea*	-	1.6	6.5	2.7
	Euclea natalensis subsp. *angustifolia*	6.5	-	-	2.2
	Combretum apiculatum subsp. *apiculatum*	-	1.6	1.6	1.1
	Combretum collinum subsp. *gazense*	-	1.6	0.1	0.6
	Dalbergia melanoxylon	-	1.6	-	0.5
	Sclerocarya birrea subsp. *caffra*	-	0.1	0.9	0.3
	Combretum hereroense	0.9	-	-	0.3
	Dichrostachys cinerea	0.1	-	0.4	0.2
	Cissus cornifolia	-	-	0.4	0.1
	Gymnosporia buxifolia	-	0.4	-	0.1
	Vachellia exuvialis	-	0.4	-	0.1

[1]Skukuza replicate, [2]N'waswitshaka replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 5.4$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.10: Mean woody densities (ind/ha) of the surveyed replicates, representing the No Burn treatment, Skukuza EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Sku[1]	Napi	N'wa[2]	
D0.5	*Dichrostachys cinerea*	60	243	93	132
	Strychnos madagascariensis	-	243	60	101
	Sclerocarya birrea subsp. *caffra*	-	-	243	81
	Ormocarpum trichocarpum	60	60	-	40
	Vachellia exuvialis	60	60	-	40
	Solanum lichtensteinii	-	35	60	32
	Grewia flavescens	60	-	13	24
	Cissus cornifolia	-	60	-	20
	Diospyros lycioides subsp. *sericea*	-	60	-	20
	Ehretia amoena	-	-	60	20
	Gymnosporia buxifolia	-	-	60	20
	Pavetta schumanniana	-	60	-	20
	Senegalia nigrescens	60	-	-	20
D1	*Dalbergia melanoxylon*	60	554	-	205
	Strychnos madagascariensis	-	243	60	101
	Euclea divinorum	243	-	-	81
	Sclerocarya birrea subsp. *caffra*	60	8	93	54
	Terminalia sericea	23	93	35	50
	Ormocarpum trichocarpum	60	60	-	40
	Cissus cornifolia	60	8	23	30
	Commiphora edulis subsp. *edulis*	60	-	-	20
	Ehretia amoena	60	-	-	20
	Ehretia rigida subsp. *nervifolia*	60	-	-	20
	Gymnosporia buxifolia	-	60	-	20

S1.5	*Dichrostachys cinerea*	-	243	35	93
	Vachellia exuvialis	-	211	23	78
	Grewia flavescens	211	1	-	71
	Combretum apiculatum subsp. *apiculatum*	-	144	13	52
	Flueggea virosa subsp. *virosa*	60	60	-	40
	Combretum hereroense	81	-	-	27
	Commiphora edulis subsp. *edulis*	-	-	60	20
	Gardenia volkensii subsp. *volkensii*	-	60	-	20
	Gymnosporia buxifolia	-	-	60	20
	Ormocarpum trichocarpum	60	-	-	20
S2	*Dichrostachys cinerea*	-	243	-	81
	Euclea divinorum	124	-	-	41
	Combretum apiculatum subsp. *apiculatum*	-	-	93	31
	Ximenia caffra	-	-	81	27
	Ormocarpum trichocarpum	60	-	-	20
T	*Vachellia exuvialis*	-	93	83	59
	Euclea natalensis subsp. *angustifolia*	83	-	-	28

[1]Skukuza replicate, [2]N'waswitshaka replicate

There are statistically significant differences between the densities of the five different height classes: $X^2 = 557.8$, $p < 0.05$ at 4 degrees of freedom (df).

Treatment: February Triennial Burn

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the February Triennial Burn treatment at the Skukuza EBP are given in Table 4.11. The mean woody densities of the species in each of the five height classes are presented in Table 4.12.

Table 4.11: Mean canopy cover (%) of the dominant woody species in the February Triennial Burn within the surveyed replicates, Skukuza EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean Canopy cover (%)
		Sku[1]	Napi	N'wa[2]	
D0.5	*Terminalia sericea*	-	1.6	0.1	0.6
	Sclerocarya birrea subsp. *caffra*	0.1	0.1	0.4	0.2
	Combretum apiculatum subsp. *apiculatum*	0.1	0.4	-	0.2
	Vachellia exuvialis	0.1	-	0.4	0.2
	Grewia flavescens	-	0.4	-	0.1
D1	*Terminalia sericea*	-	1.6	0.9	0.8
	Combretum apiculatum subsp. *apiculatum*	0.4	0.4	0.4	0.4
	Dichrostachys cinerea	0.4	-	0.4	0.3
	Vachellia exuvialis	0.1	-	0.4	0.2
	Grewia flavescens	-	0.4	-	0.1
S1.5	*Combretum apiculatum* subsp. *apiculatum*	0.4	-	2.5	1
	Dichrostachys cinerea	0.4	1.6	-	0.7
	Terminalia sericea	0.1	1.6	-	0.5
	Vachellia exuvialis	-	0.4	0.4	0.3
	Combretum collinum subsp. *gazense*	0.1	0.4	-	0.2
	Grewia flavescens	-	0.4	0.1	0.2
S2	*Combretum apiculatum* subsp. *apiculatum*	0.4	-	2.5	1
	Dichrostachys cinerea	0.4	1.6	-	0.7
	Spirostachys africana	-	0.9	-	0.3
	Combretum zeyheri	0.4	-	0.1	0.2
	Vachellia exuvialis	0.1	-	0.4	0.2
	Pterocarpus rotunidifolius subsp. *rotunidifolius*	-	-	0.4	0.1
	Senegalia nigrescens	-	-	0.4	0.1
	Vachellia gerrardii	-	-	0.4	0.1

T	*Combretum apiculatum* subsp. *apiculatum*	2.5	2.5	2.5	2.5
	Terminalia sericea	0.4	2.5	1.6	1.5
	Dichrostachys cinerea	0.9	1.6	0.1	0.9
	Combretum collinum subsp. *gazense*	0.1	1.6	0.4	0.7
	Peltophorum africanum	-	1.6	0.1	0.6
	Spirostachys africana	-	1.6	-	0.5
	Combretum zeyheri	0.4	0.1	-	0.2
	Gymnosporia buxifolia	0.4	-	0.1	0.2

[1]Skukuza replicate, [2]N'waswitshaka replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 1.6$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.12: Mean woody densities (ind/ha) of the surveyed replicates, representing the February Triennial Burn, Skukuza EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Sku[1]	Napi	N'wa[2]	
D0.5	*Terminalia sericea*	-	374	60	145
	Sclerocarya birrea subsp. *caffra*	60	23	93	59
	Vachellia exuvialis	60	-	93	51
	Combretum apiculatum subsp. *apiculatum*	23	93	-	39
	Cissus cornifolia	60	23	23	35
	Commiphora edulis subsp. *edulis*	60	23	-	28
	Solanum lichtensteinii	60	23	-	28
	Dichrostachys cinerea	-	-	60	20
	Lannea schweinfurthii	60	-	-	20
	Strychnos madagascariensis	60	-	-	20
	Ziziphus mucronata	-	-	60	20
D1	*Terminalia sericea*	-	374	211	195
	Dichrostachys cinerea	-	93	243	112
	Combretum apiculatum subsp. *apiculatum*	23	93	93	70
	Vachellia exuvialis	60	-	93	51
	Solanum lichtensteinii	60	23	23	35
	Cissus cornifolia	60	23	-	28
	Commiphora edulis subsp. *edulis*	60	23	-	28
	Sclerocarya birrea subsp. *caffra*	60	23	-	28
	Combretum collinum subsp. *gazense*	-	-	60	20
	Combretum zeyheri	-	-	60	20
	Lannea schweinfurthii	60	-	-	20
	Strychnos madagascariensis	60	-	-	20
S1.5	*Combretum apiculatum* subsp. *apiculatum*	93	-	585	226
	Dichrostachys cinerea	13	374	-	129
	Terminalia sericea	3	374	-	126
	Vachellia exuvialis	-	93	93	62
	Dalbergia melanoxylon	-	60	-	20
S2	*Dichrostachys cinerea*	93	374	-	156
	Spirostachys africana	-	211	-	70

T	*Dichrostachys cinerea*	31	144	8	61
	Combretum apiculatum subsp. *apiculatum*	32	86	32	50
	Terminalia sericea	5	32	83	40

[1]Skukuza replicate, [2]N'waswitshaka replicate

There are statistically significant differences between the densities of the five different height classes: $X^2 = 10.9$, $p < 0.05$ at 4 degrees of freedom (df).

Treatment: August Triennial Burn

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the August Triennial Burn at the Skukuza EBP are given in Table 4.13. The mean woody densities of the species in each of the five height classes are presented in Table 4.14.

Table 4.13: Mean canopy cover (%) of the dominant woody species in the August Triennial Burn within the surveyed replicates, Skukuza EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Sku[1]	Napi	N'wa[2]	
D0.5	*Strychnos madagascariensis*	-	0.9	0.4	0.4
	Terminalia sericea	-	-	0.4	0.1
	Vachellia exuvialis	0.4	0.1	-	0.2
D1	*Strychnos madagascariensis*	-	0.9	0.4	0.4
	Terminalia sericea	-	-	0.4	0.1
S1.5	*Combretum apiculatum* subsp. *apiculatum*	-	1.6	0.4	0.7
	Strychnos madagascariensis	-	0.9	0.4	0.4
	Albizia harveyi	0.9	-	-	0.3
	Combretum collinum subsp. *gazense*	-	0.4	0.1	0.2
S2	*Strychnos madagascariensis*	-	0.4	0.4	0.3
	Combretum apiculatum subsp. *apiculatum*	-	0.4	0.4	0.3
	Combretum collinum subsp. *gazense*	-	0.4	0.1	0.2
	Catunaregam spinosa	-	-	0.4	0.1
T	*Terminalia sericea*	0.9	-	3.63	1.5
	Combretum apiculatum subsp. *apiculatum*	0.9	2.5	0.4	1.3
	Combretum zeyheri	0.9	0.1	-	0.3
	Combretum collinum subsp. *gazense*	-	0.4	0.1	0.2
	Strychnos madagascariensis	-	0.4	-	0.1

[1]Skukuza replicate, [2]N'waswitshaka replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 2.1$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.14: Mean Woody densities (ind/ha) of the surveyed replicates, representing the August Triennial Burn, Skukuza EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Sku[1]	Napi	N'wa[2]	
D0.5	*Strychnos madagascariensis*	-	554	35	196
	Vachellia exuvialis	93	60	-	51
	Dichrostachys cinerea	60	23	8	30
	Dalbergia melanoxylon	-	60	-	20
	Gardenia volkensii subsp. *volkensii*	-	60	-	20
	Sclerocarya birrea subsp. *caffra*	-	60	-	20
D1	*Strychnos madagascariensis*	-	554	35	196
	Combretum apiculatum subsp. *apiculatum*	2	60	-	21
	Sclerocarya birrea subsp. *caffra*	-	60	-	20
S1.5	*Strychnos madagascariensis*	-	554	93	216
	Combretum apiculatum subsp. *apiculatum*	-	374	35	136
	Albizia harveyi	211	-	-	70
S2	*Strychnos madagascariensis*	-	93	93	62
	Combretum apiculatum subsp. *apiculatum*	-	93	35	43
	Gymnosporia buxifolia	-	60	-	20
T	*Terminalia sericea*	31	-	47	26

[1]Skukuza replicate, [2]N'waswitshaka replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 259.5$, $p < 0.05$ at 4 degrees of freedom (df).

Treatment: August Annual Burn

Dominant woody species, mean canopy cover and mean woody densities of the different growth forms and height classes, of the August Annual Burn at the Skukuza EBP are given in Table 4.15 and 4.16.

Table 4.15: Mean canopy cover (%) of the dominant woody species in the August Annual Burn within the surveyed replicates, Skukuza EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Sku[1]	Napi	N'wa[2]	
D0.5	*Strychnos madagascariensis*	-	0.1	0.4	0.2
	Vachellia exuvialis	-	0.1	0.4	0.2
	Xerophyta retinervis	-	-	0.4	0.1
D1	*Strychnos madagascariensis*	-	-	1.6	0.5
	Terminalia sericea	0.9	-	0.4	0.4
	Combretum apiculatum subsp. *apiculatum*	0.9	-	0.1	0.3
	Combretum collinum subsp. *gazense*	-	0.9	0.1	0.3
	Sclerocarya birrea subsp. *caffra*	0.4	-	0.1	0.2
	Vachellia exuvialis			0.4	0.1
S1.5	*Combretum apiculatum* subsp. *apiculatum*	-	1.6	0.4	0.7
	Combretum collinum subsp. *gazense*	-	1.6	0.1	0.6
	Terminalia sericea	0.4	-	0.9	0.4
	Pterocarpus rotunidifolius subsp. *rotunidifolius*	-	0.4	0.1	0.2
S2	*Combretum collinum* subsp. *gazense*	-	1.6	0.1	0.6
	Terminalia sericea	0.1	-	0.9	0.3
	Combretum apiculatum subsp. *apiculatum*	0.1	-	0.4	0.2
	Pterocarpus rotunidifolius subsp. *rotunidifolius*	-	0.4	-	0.1
T	*Combretum apiculatum* subsp. *apiculatum*	0.9	1.6	0.4	1
	Combretum collinum subsp. *gazense*	-	1.6	0.1	0.6
	Terminalia sericea	0.4	-	0.9	0.4
	Sclerocarya birrea subsp. *caffra*	-	-	0.9	0.3

[1]Skukuza replicate, [2]N'waswitshaka replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 3.5$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.16: mean woody densities (ind/ha) of the surveyed replicates, representing the August Annual Burn, Skukuza EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Sku[1]	Napi	N'wa[2]	
D0.5	*Strychnos madagascariensis*	-	23	243	89
	Xerophyta retinervis	-	-	243	81
	Sclerocarya birrea subsp. *caffra*	60	60	-	40
	Vachellia exuvialis	-	8	93	34
	Dalbergia melanoxylon	60	-	23	28
	Ormocarpum trichocarpum	60	-	23	28
	Cissus cornifolia	-	60	-	20
	Combretum collinum subsp. *gazense*	-	60	-	20
	Grewia bicolor	-	60	-	20
	Schotia brachypetala	-	60	-	20
D1	*Combretum collinum* subsp. *gazense*	-	554	8	187
	Strychnos madagascariensis	-	-	374	125
	Combretum apiculatum subsp. *apiculatum*	211	-	23	78
	Terminalia sericea	81	-	93	58
	Vachellia exuvialis	-	-	93	31
	Grewia bicolor	-	60	-	20
S1.5	*Combretum apiculatum* subsp. *apiculatum*	-	55	93	49
	Combretum collinum subsp. *gazense*	-	144	3	49
	Diospyros lycioides subsp. *sericea*	-	60	-	20
	Sclerocarya birrea subsp. *caffra*	60	-	-	20
S2	*Terminalia sericea*	3	-	81	28
	Combretum collinum subsp. *gazense*	-	55	3	19
T	*Combretum apiculatum* subsp. *apiculatum*	81	20	13	38

[1]Skukuza replicate,[2]N'waswitshaka replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 559.5$, $p < 0.05$ at 4 degrees of freedom (df).

4.1.2.2 Between-treatment analysis

A comparison of the mean canopy cover of the different growth forms and height classes between the various treatments are given in Figure 4.3. The mean woody densities of the different treatments were summarized in Table 4.10 (No Burn); Table 4.12 (February Triennial Burn); Table 4.14 (August Triennial Burn); and Table 4.16 (August Annual Burn). A comparison of the mean densities of the different growth forms and height classes between the various treatments is given in Figure 4.4.

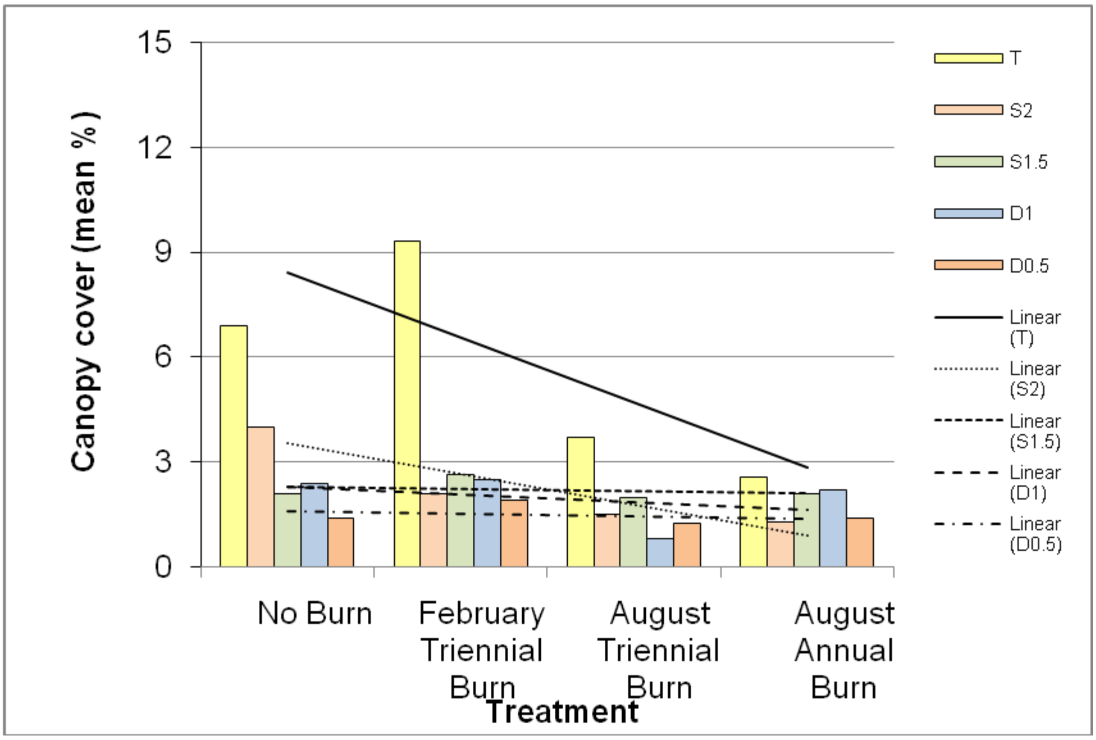

Figure 4.3: The mean canopy cover (%) in each woody height class for each treatment, located in the Skukuza EBP, Kruger National Park.

The total mean woody canopy cover for each treatment in the Skukuza EBP are the following: No Burn treatment, 16.8%; February Triennial Burn, 18.5%; August Triennial Burn, 9.3%; and August Annual Burn, 3.5%.

There are no statistically significant differences between the mean canopy cover of the four treatments within the following height classes: D0.5 - $X^2 = 7.3$, $p > 0.05$ at 3 degrees of freedom (df); D1 - $X^2 = 7.5$, $p > 0.05$ at 3 df; S1.5 - $X^2 = 6.1$, $p > 0.05$ at 3 df; S2 - $X^2 = 6.8$, $p > 0.05$ at 3 df; and T - $X^2 = 4.8$, $p > 0.05$ at 3 df.

There are no statistically significant differences between the total mean canopy cover of the four treatments: $X^2 = 3.3$, $p > 0.05$ at 3 degrees of freedom (df).

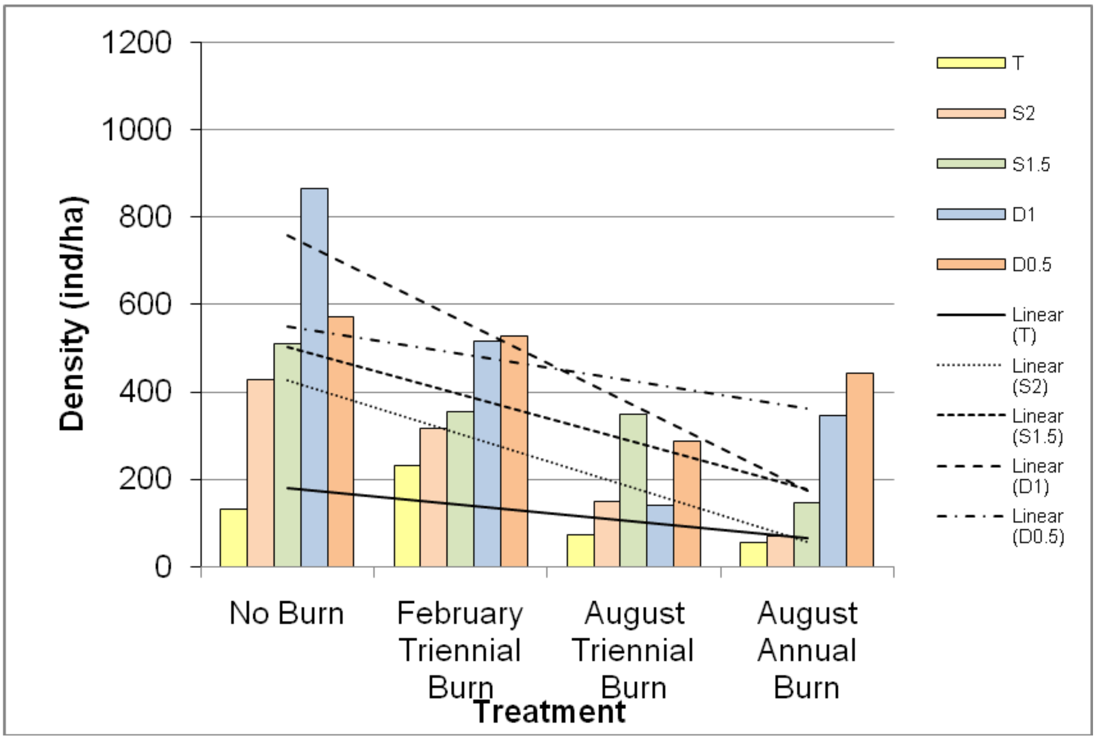

Figure 4.4: The mean density (ind/ha), in each woody height class for each treatment located in the Skukuza EBP, Kruger National Park.

The total mean woody densities for each treatment in the Skukuza EBP are the following: No Burn treatment, 2 511 ind/ha; February Triennial Burn, 1 954 ind/ha; August Triennial Burn, 1 005 ind/ha; and August Annual Burn, 1 065 ind/ha.

There are statistically significant differences between the mean densities of the four treatments within the following height classes: D0.5 - $X^2 = 102.5$, $p < 0.05$ at 3 degrees of freedom (df); D1 - $X^2 = 607.6$, $p < 0.05$ at 3 df; S1.5 - $X^2 = 196$, $p < 0.05$ at 3 df; - $X^2 = 322.3$, $p < 0.05$ at 3 df; and T - $X^2 = 150.1$, $p < 0.05$ at 3 df.

There are statistically significant differences between the total mean densities of the four treatments: $X^2 = 972.8$, $p < 0.05$ at 3 degrees of freedom (df).

4.1.3 Satara Experimental Burn Plot

4.1.3.1 Within-treatment analysis

Treatment: No Burn

Dominant woody species and mean canopy cover of the different growth forms and height classes of the No Burn treatments at the Satara EBP are given in Table 4.17. The mean woody densities of the species in each of the five height classes are presented in Table 4.18.

Table 4.17: Mean canopy cover (%) of the dominant woody species in the No Burn treatment within the surveyed replicates, Satara EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Mar[1]	N'Wa[2]	Sat[3]	
D0.5	*Solanum panduriforme*	0.4	0.1	-	0.2
D1	*Ehretia amoena*	-	0.4	0.1	0.2
S1.5	*Combretum imberbe*	-	0.4	0.1	0.2
	Commiphora africana var. *africana*	0.1	-	0.4	0.2
	Diospyros lycioides subsp. *sericea*	-	0.4	-	0.1
S2	*Commiphora africana* var. *africana*	0.4	0.1	0.9	0.5
	Vachellia exuvialis	-	-	1.6	0.5
	Diospyros lycioides subsp. *sericea*	-	0.4	-	0.1
	Philenoptera violacea	-	0.4	-	0.1
T	*Cassia abbreviata* subsp. *beareana*	-	-	0.4	0.1
	Combretum imberbe	-	0.4	0.4	0.3
	Commiphora africana var. *africana*	0.1	-	0.4	0.2
	Senegalia nigrescens	-	0.4	0.1	0.2
	Diospyros lycioides subsp. *sericea*	-	0.4	-	0.1
	Philenoptera violacea	-	0.4	-	0.1

[1]Marheya replicate, [2]N'Wanetsi replicate, [3]Satara replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 4.6$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.18: Mean woody densities (ind/ha) of the surveyed replicates, representing the No Burn treatment, Satara EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Mar[1]	N'Wa[2]	Sat[3]	
D0.5	*Solanum panduriforme*	640	16	-	219
	Commiphora africana var. *africana*	160	-	-	53
	Ehretia amoena	60	16	23	33
	Dichrostachys cinerea	60	-	-	20
	Senegalia nigrescens	60	-	-	20
	Ziziphus mucronata	-	-	60	20
D1	*Ehretia amoena*	-	243	23	89
	Flueggea virosa subsp. *virosa*	160	60	-	73
	Combretum imberbe	-	160	-	53
	Sclerocarya birrea subsp. *caffra*	-	-	160	53
	Philenoptera violacea	60	60	-	40
	Dichrostachys cinerea	60	23	23	35
	Commiphora africana var. *africana*	60	-	-	20
	Senegalia nigrescens	-	60	-	20
S1.5	*Combretum imberbe*	-	243	-	81
	Diospyros lycioides subsp. *sericea*	-	93	-	31
	Dichrostachys cinerea	60	-	-	20
S2	*Commiphora africana* var. *africana*	93	23	81	66
	Vachellia exuvialis	-	-	144	48
	Diospyros lycioides subsp. *sericea*	-	93	-	31
	Philenoptera violacea	-	93	-	31
	Combretum imberbe	-	60	-	20

[1] Marheya replicate, [2] N'Wanetsi replicate, [3] Satara replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 328.2$, $p < 0.05$ at 4 degrees of freedom (df).

Treatment: February Triennial Burn

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the February Triennial Burn treatment at the Satara EBP are given in Table 4.19. The mean woody densities of the species in each of the five height classes are presented in Table 4.20.

Table 4.19: Mean canopy cover (%) of the dominant woody species in the February Triennial Burn within the surveyed replicates, Satara EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Mar[1]	N'Wa[2]	Sat[3]	
D0.5	*Maerua edulis*	0.4	-	-	0.1
D1	*Maerua edulis*	1.61	-	-	0.5
	Solanum panduriforme	0.4	0.4	0.1	0.3
	Dichrostachys cinerea	0.4	0.1	0.1	0.2
	Grewia flava	0.1	-	0.4	0.2
S1.5	*Dichrostachys cinerea*	0.4	0.91	0.91	0.8
	Flueggea virosa subsp. *virosa*	-	1.61	0.1	0.6
	Philenoptera violacea	-	0.4	0.1	0.2
	Balanites maughamii	0.4	-	-	0.1
	Combretum imberbe	-	0.4	-	0.1
S2	*Dichrostachys cinerea*	1.61	0.91	0.1	0.9
	Flueggea virosa subsp. *virosa*	-	0.4	-	0.1
	Philenoptera violacea	0.4	-	-	0.1
T	*Philenoptera violacea*	0.4	0.4	-	0.3
	Commiphora africana var. *africana*	0.4	-	0.1	0.2
	Balanites maughamii	0.4	-	-	0.1
	Combretum imberbe	-	0.4	-	0.1
	Dichrostachys cinerea	-	0.4	-	0.1
	Senegalia nigrescens	-	0.4	-	0.1

[1]Marheya replicate, [2]N'Wanetsi replicate, [3]Satara replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 4.2$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.20: Mean woody densities (ind/ha) of the surveyed replicates, representing the February Triennial Burn, Satara EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Mar[1]	N'Wa[2]	Sat[3]	
D0.5	*Maerua edulis*	640	-	-	213
	Flueggea virosa subsp. *virosa*	-	160	60	73
	Dalbergia melanoxylon	-	160	-	53
	Solanum panduriforme	-	160	-	53
	Sclerocarya birrea subsp. *caffra*	-	6	60	22
	Dichrostachys cinerea	-	-	60	20
	Senegalia nigrescens	-	-	60	20
	Vachellia exuvialis	-	60	-	20
D1	*Solanum panduriforme*	640	640	160	480
	Maerua edulis	981	-	-	327
	Flueggea virosa subsp. *virosa*	-	160	60	73
	Dichrostachys cinerea	93	60	8	54
	Grewia bicolor	160	-	-	53
	Sclerocarya birrea subsp. *caffra*	60	60	-	40
	Ehretia amoena	23	-	60	28
	Commiphora africana var. *africana*	60	-	-	20
	Philenoptera violacea	60	-	-	20
S1.5	*Flueggea virosa* subsp. *virosa*	-	374	8	127
	Dichrostachys cinerea	35	211	81	109
	Philenoptera violacea	-	243	23	89
	Aspargus setaceus	-	160	-	53
	Pergularia daemia subsp. *daemia*	-	-	60	20
S2	*Dichrostachys cinerea*	144	81	8	78

[1]Marheya replicate, [2]N'Wanetsi replicate, [3]Satara replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 1739.4$, $p < 0.05$ at 4 degrees of freedom (df).

Treatment: August Triennial Burn

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the August Triennial Burn at the Satara EBP are given in Table 4.21. The mean woody densities of the species in each of the five height classes are presented in Table 4.22.

Table 4.21: Mean canopy cover (%) of the dominant woody species in the August Triennial Burn within the surveyed replicates, Satara EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Mar[1]	N'Wa[2]	Sat[3]	
D0.5	*Solanum panduriforme*	0.4	-	-	1.3
	Dichrostachys cinerea	0.9	-	0.4	0.4
D1	*Dichrostachys cinerea*	0.9	0.1	0.1	0.4
	Solanum panduriforme	0.4	0.4	-	0.3
	Ehretia amoena	0.4	0.1	0.1	0.2
	Flueggea virosa subsp. *virosa*	-	0.4	0.1	0.2
S1.5	*Dichrostachys cinerea*	0.9	-	0.9	0.6
	Commiphora africana var. *africana*	0.4	-	-	0.1
	Ehretia amoena	0.4	-	-	0.1
S2	*Combretum imberbe*	-	0.4	-	0.1
	Commiphora africana var. *africana*	0.4	-	-	0.1
	Dichrostachys cinerea	-	-	0.4	0.1
T	*Senegalia nigrescens*	0.1	3.6	0.1	1.3
	Combretum imberbe	-	1.6	0.4	1
	Combretum hereroense	-	0.1	0.4	0.2
	Vachellia exuvialis	-	-	0.4	0.1

[1]Marheya replicate, [2]N'Wanetsi replicate, [3]Satara replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 8.2$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.22: Mean woody densities (ind/ha) of the surveyed replicates, representing the August Triennial Burn, Satara EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Mar[1]	N'Wa[2]	Sat[3]	
D0.5	*Vachellia exuvialis*	160	60	1091	437
	Dichrostachys cinerea	554	-	243	266
	Solanum panduriforme	640	-	-	213
	Commiphora africana var. *africana*	160	-	-	53
	Sclerocarya birrea subsp. *caffra*	60	60	-	40
	Flueggea virosa subsp. *virosa*	-	60	-	20
	Ziziphus mucronata	-	-	60	20
D1	*Dichrostachys cinerea*	554	160	23	246
	Solanum panduriforme	243	243	-	162
	Ehretia amoena	93	160	23	92
	Sclerocarya birrea subsp. *caffra*	60	-	-	20
	Vachellia exuvialis	-	60	-	20
S1.5	*Dichrostachys cinerea*	31	-	81	37
	Commiphora africana var. *africana*	93	-	-	31
T	*Senegalia nigrescens*	3	326	-	110
	Combretum imberbe	-	144	13	52

[1]Marheya replicate, [2]N'Wanetsi replicate, [3]Satara replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 3761.7$, $p < 0.05$ at 4 degrees of freedom (df).

<u>Treatment: August Annual Burn</u>

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the August Annual Burn at the Satara EBP are given in Table 4.23. The mean woody densities of the species in each of the five height classes are presented in Table 4.24.

Table 4.23: Mean canopy cover (%) of the dominant woody species in the August Annual Burn within the surveyed replicates, Satara EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Mar[1]	N'Wa[2]	Sat[3]	
D0.5	*Dichrostachys cinerea*	0.1	1.6	-	0.6
	Ehretia amoena	0.4	0.1	0.1	0.2
	Solanum panduriforme	0.4	0.1	-	0.2
	Flueggea virosa subsp. *virosa*	0.4	-	-	0.1
D1	*Dichrostachys cinerea*	-	0.4	0.1	0.2
	Senegalia nigrescens	0.4	-	-	0.1
S1.5	*Combretum imberbe*	-	-	0.4	0.1

[1]Marheya replicate, [2]N'Wanetsi replicate, [3]Satara replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 1.4$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.24: Mean woody densities (ind/ha) of the surveyed replicates, representing the August Annual Burn, Satara EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Mar[1]	N'Wa[2]	Sat[3]	Mean density (ind/ha)
D0.5	*Dichrostachys cinerea*	60	981	-	347
	Ehretia amoena	640	60	23	241
	Solanum panduriforme	640	60	6	235
	Flueggea virosa subsp. *virosa*	640	-	-	213
	Grewia bicolor	160	-	-	53
	Grewia flava	-	160	-	53
	Ziziphus mucronata	-	-	160	53
	Sclerocarya birrea subsp. *caffra*	60	-	60	40
	Senegalia nigrescens	-	60	60	40
	Vachellia exuvialis	-	60	23	28
D1	*Dichrostachys cinerea*	-	243	60	101
	Senegalia nigrescens	93	-	-	31
	Grewia flava	-	60	-	20
S1.5	*Senegalia nigrescens*	-	60	-	20

[1]Marheya replicate, [2]N'Wanetsi replicate, [3]Satara replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 1458.1$, $p < 0.05$ at 4 degrees of freedom (df).

4.1.3.2 Between-treatment analysis

A comparison of the mean canopy cover of the different growth forms and height classes between the various treatments are given in Figure 4.5. The mean woody densities of the different treatments were summarized in Table 4.18 (No Burn); Table 4.20 (February Triennial Burn); Table 4.22 (August Triennial Burn); and Table 4.24 (August Annual Burn). A comparison of the mean densities of the different growth forms and height classes between the various treatments are given in Figure 4.6.

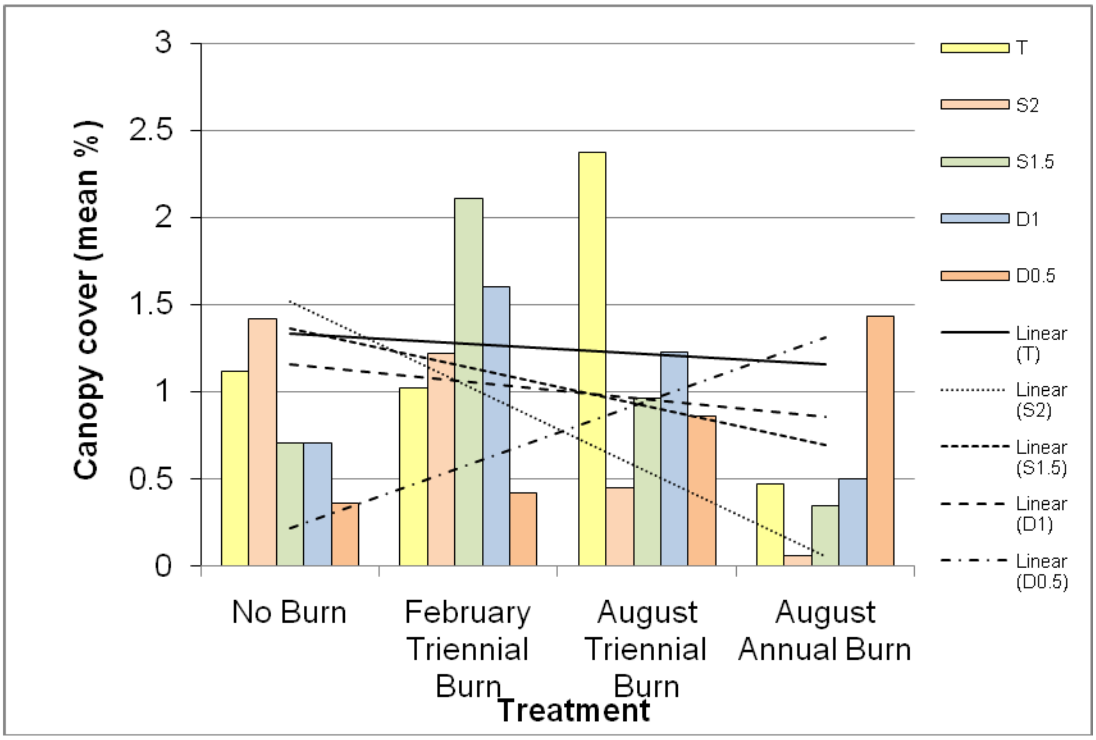

Figure 4.5: The mean canopy cover (%) in each woody height class for each treatment, located in the Satara EBP, Kruger National Park.

The total mean woody canopy cover for each treatment in the Pretoriuskop EBP are the following: No Burn treatment, 4.3%; February Triennial Burn, 6.4%; August Triennial Burn, 5.9%; and August Annual Burn, 2.8%.

There are no statistically significant differences between the mean canopy cover of the four treatments within the following height classes: D0.5 - X^2 =7.2, $p > 0.05$ at 3 degrees of freedom (df); D1 - X^2 = 8.9, $p > 0.05$ at 3 df; S1.5 - X^2 = 6.5, $p > 0.05$ at 3 df; S2 - X^2 = 1, $p > 0.05$ at 3 df; and T - X^2 = 12, $p > 0.05$ at 3 df.

There are no statistically significant differences between the total mean canopy cover of the four treatments: $X^2 = 5.6$, $p > 0.05$ at 3 degrees of freedom (df).

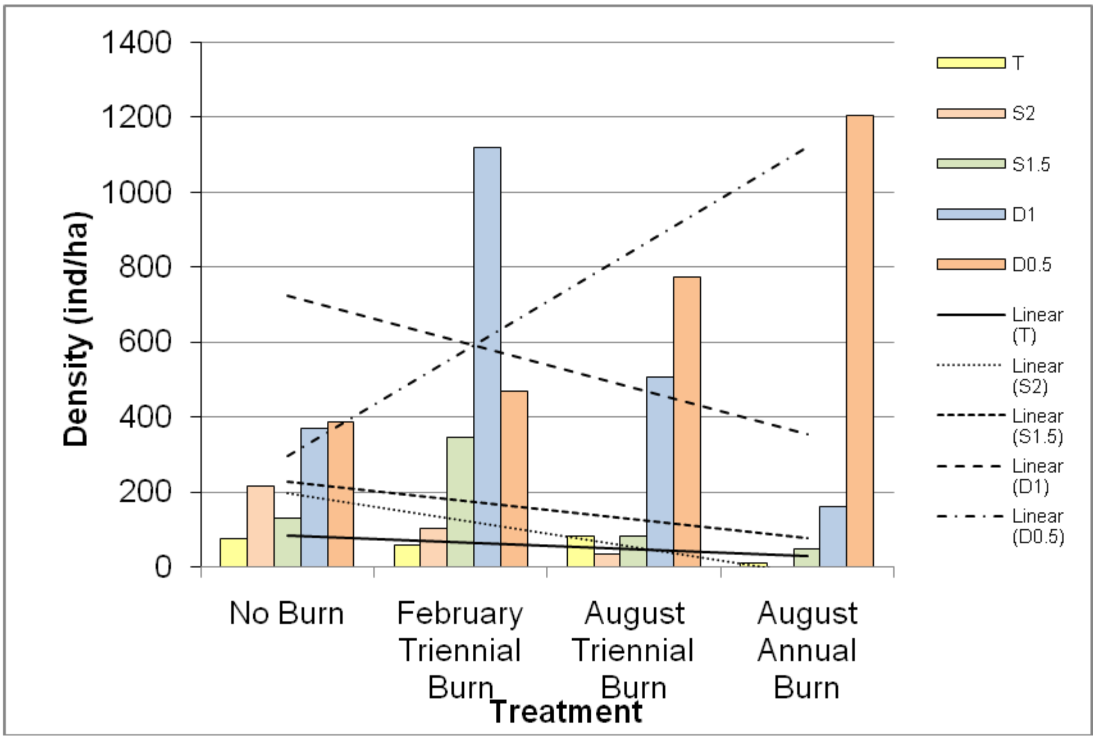

Figure 4.6: The mean density (ind/ha), in each woody height class for each treatment located in the Satara EBP, Kruger National Park.

The total mean woody densities for each treatment in the Satara EBP are the following: No Burn treatment, 1 185 ind/ha; February Triennial Burn, 2 097 ind/ha; August Triennial Burn, 1 429 ind/ha; and August Annual Burn, 1 482 ind/ha.

There are statistically significant differences between the four treatments within the following height classes: D0.5 - $X^2 = 579.9$, $p < 0.05$ at 3 degrees of freedom (df); D1 - $X^2 = 939.5$, $p < 0.05$ at 3 df; S1.5 - $X^2 = 348.7$, $p < 0.05$ at 3 df; S2 - $X^2 = 306.1$, $p < 0.05$ at 3 df; and T - $X^2 = 56.4$, $p < 0.05$ at 3 df.

4.1.4 Mopani Experimental Burn Plot

4.1.4.1 Within-treatment analysis

Treatment: No Burn

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the No Burn treatments at the Mopani EBP are given in Table 4.25. The mean woody densities of the species in each of the five height classes are presented in Table 4.26.

Table 4.25: Mean canopy cover (%) of the dominant woody species in the No Burn treatment within the surveyed replicates, Mopani EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Tse[1]	Mooi[2]	Dzo[3]	
D0.5	*Senegalia nigrescens*	-	-	0.4	0.1
	Solanum panduriforme	-	-	0.4	0.1
S1.5	*Colophospermum mopane*	1.6	6.5	0.4	2.9
S2	*Colophospermum mopane*	6.5	10.1	0.1	5.7
T	*Colophospermum mopane*	10.1	14.5	10.1	11.6
	Terminalia prunioides	0.9	-	-	0.3

[1]Tsende replicate, [2]Mooiplaas replicate, [3]Dzombo replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 21.4$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.26: Mean woody densities (ind/ha) of the surveyed replicates, representing the No Burn treatment, Mopani EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Tse[1]	Mooi[2]	Dzo[3]	
D0.5	*Senegalia nigrescens*	-	-	640	213
	Commiphora africana var. *africana*	440	60	-	167
	Solanum panduriforme	-	-	243	81
	Dichrostachys cinerea	160	-	60	73
	Vachellia exuvialis	-	23	60	28
	Aspargus setaceus	-	-	60	20
	Commiphora glandulosa	-	-	60	20
D1	*Dichrostachys cinerea*	60	-	-	20
	Vachellia exuvialis	60	-	-	20
S1.5	*Colophospermum mopane*	144	220	35	133
S2	*Colophospermum mopane*	220	344	3	189
T	*Colophospermum mopane*	131	495	344	323
	Vachellia exuvialis	60	-	-	20

[1]Tsende replicate, [2]Mooiplaas replicate, [3]Dzombo replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 14$, $p < 0.05$ at 4 degrees of freedom (df).

Treatment: February Triennial Burn

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the February Triennial Burn treatment at the Mopani EBP are given in Table 4.27. The mean woody densities of the species in each of the five height classes are presented in Table 4.28.

Table 4.27: Mean canopy cover (%) of the dominant woody species in the February Triennial Burn within the surveyed replicates, Mopani EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Tse[1]	Mooi[2]	Dzo[3]	
D0.5	*Colophospermum mopane*	0.1	0.4	0.1	0.2
	Senegalia nigrescens	-	-	0.4	0.1
D1	*Colophospermum mopane*	0.4	0.4	0.1	0.3
	Commiphora africana var. *africana*	0.4	0.1	-	0.2
S1.5	*Colophospermum mopane*	3.6	1.6	0.1	0.8
S2	*Colophospermum mopane*	10.1	3.6	2.5	5.4
T	*Colophospermum mopane*	19.8	6.5	10.1	12.1

[1]Tsende replicate, [2]Mooiplaas replicate, [3]Dzombo replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 23.3$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.28: Mean woody densities (ind/ha) of the surveyed replicates, representing the February Triennial Burn, Mopani EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Tse[1]	Mooi[2]	Dzo[3]	
D0.5	*Colophospermum mopane*	440	35	160	212
	Aspargus setaceus	-	-	160	53
	Solanum panduriforme	-	-	160	53
	Senegalia nigrescens	-	-	93	31
	Commiphora africana var. *africana*	-	60	-	20
	Dichrostachys cinerea	-	60	-	20
D1	*Commiphora africana* var. *africana*	640	60	-	233
	Colophospermum mopane	93	35	23	50
	Dichrostachys cinerea	-	60	-	20
S1.5	*Colophospermum mopane*	326	144	23	164
S2	*Colophospermum mopane*	344	326	86	252
T	*Colophospermum mopane*	256	220	344	273

[1]Tsende replicate, [2]Mooiplaas replicate, [3]Dzombo replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 1104$, $p > 0.05$ at 4 degrees of freedom (df).

Treatment: August Triennial Burn

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the August Triennial Burn at the Mopani EBP are given in Table 4.29. The mean woody densities of the species in each of the five height classes are presented in Table 4.30.

Table 4.29: Mean canopy cover (%) of the dominant woody species in the August Triennial Burn within the surveyed replicates, Mopani EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Tse[1]	Mooi[2]	Dzo[3]	
D0.5	*Colophospermum mopane*	0.1	1.6	0.1	0.6
	Commiphora africana var. *africana*	-	0.4	0.1	0.2
D1	*Colophospermum mopane*	0.1	1.6	0.1	0.6
	Commiphora africana var. *africana*	-	0.4	-	0.1
S1.5	*Colophospermum mopane*	0.1	1.6	1.6	1.1
S2	*Colophospermum mopane*	4.9	10.1	6.5	7.2
T	*Colophospermum mopane*	0.4	14.5	0.4	5.1

[1]Tsende replicate, [2]Mooiplaas replicate, [3]Dzombo replicate

There are no statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 11.7$, $p > 0.05$ at 4 degrees of freedom (df).

Table 4.30: Mean woody densities (ind/ha) of the surveyed replicates, representing the August Triennial Burn, Mopani EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Tse[1]	Mooi[2]	Dzo[3]	
D0.5	*Colophospermum mopane*	8	981	23	337
	Dichrostachys cinerea	440	-	-	147
	Commiphora africana var. *africana*	-	243	60	101
	Grewia bicolor	-	160	-	53
	Solanum lichtensteinii	-	-	60	20
D1	*Colophospermum mopane*	3	55	23	27
S1.5	*Colophospermum mopane*	3	144	144	97
S2	*Colophospermum mopane*	64	344	579	329
T	*Colophospermum mopane*	5	71	13	30

[1]Tsende replicate, [2]Mooiplaas replicate, [3]Dzombo replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 687.7$, $p < 0.05$ at 4 degrees of freedom (df).

Treatment: August Annual Burn

Dominant woody species and mean canopy cover of the different growth forms and height classes, of the August Annual Burn at the Mopani EBP are given in Table 4.31. The mean woody densities of the species in each of the five height classes are presented in Table 4.32.

Table 4.31: Mean canopy cover (%) of the dominant woody species in the August Annual Burn within the surveyed replicates, Mopani EBP, Kruger National Park (only woody species >0.4% mean canopy cover are included)

Height class code (m)	Species	Replicate			Mean canopy cover (%)
		Tse[1]	Mooi[2]	Dzo[3]	
D0.5	*Colophospermum mopane*	1.6	-	3.6	1.8
	Ormocarpum trichocarpum	0.9	0.1	-	0.3
D1	*Colophospermum mopane*	2.5	1.6	6.5	3.5
	Ormocarpum trichocarpum	0.9	0.1	-	0.3
	Commiphora africana var. *africana*	-	-	0.4	0.1
	Grewia bicolor	-	0.4	-	0.1
S1.5	*Colophospermum mopane*	-	19.8	2.5	7.4
S2	*Colophospermum mopane*	8.2	10.1	0.4	6.2
T	*Colophospermum mopane*	3.6	10.1	0.1	4.6

[1]Tsende replicate, [2]Mooiplaas replicate, [3]Dzombo replicate

There are statistically significant differences between the mean canopy cover of the five different height classes: $X^2 = 40.1$, $p < 0.05$ at 4 degrees of freedom (df).

Table 4.32: Mean woody densities (ind/ha) of the surveyed replicates, representing the August Annual Burn, Mopani EBP, Kruger National Park (only woody species with a mean density >60 ind/ha are included)

Height class code (m)	Species	Replicate			Mean density (ind/ha)
		Tse[1]	Mooi[2]	Dzo[3]	
D0.5	*Colophospermum mopane*	144	-	844	329
	Ormocarpum trichocarpum	554	23	-	192
	Dichrostachys cinerea	440	-	-	147
	Vachellia exuvialis	440	-	-	147
	Commiphora africana var. africana	-	60	-	20
	Commiphora glandulosa	-	-	60	20
D1	*Colophospermum mopane*	226	144	579	316
	Grewia bicolor	-	243	-	81
	Ormocarpum trichocarpum	554	23	-	192
S1.5	*Colophospermum mopane*	-	1775	86	620
S2	*Colophospermum mopane*	279	906	35	407
T	*Colophospermum mopane*	47	906	3	319

[1]Tsende replicate, [2]Mooiplaas replicate, [3]Dzombo replicate

There are statistically significant differences between the mean densities of the five different height classes: $X^2 = 404.7$, $p < 0.05$ at 4 degrees of freedom (df).

4.1.4.2 Between-treatment analysis

A comparison of the mean canopy cover of the different growth forms and height classes between the various treatments are given in Figure 4.7. The mean woody densities of the different treatments were summarized in Table 4.26 (No Burn); Table 4.28 (February Triennial Burn); Table 4.30 (August Triennial Burn); and Table 4.32 (August Annual Burn). A comparison of the mean densities of the different growth forms and height classes between the various treatments are given in Figure 4.8.

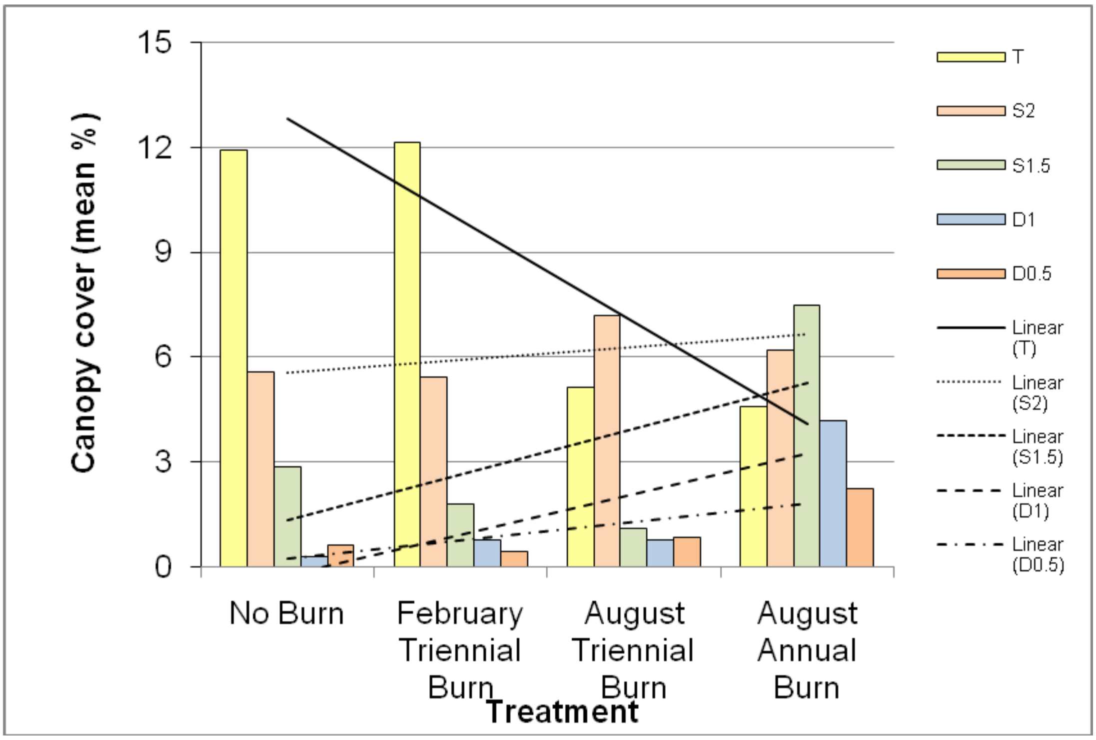

Figure 4.7: The mean canopy cover (%) in each woody height class for each treatment, located in the Mopani EBP, Kruger National Park.

The total mean woody canopy cover for each treatment in the Pretoriuskop EBP are the following: No Burn treatment, 21.8%; February Triennial Burn, 20.6%; August Triennial Burn, 15.1%; and August Annual Burn, 24.7%.

There are no statistically significant differences between the mean canopy cover of the four treatments within the following height classes: D0.5 - $X^2 = 18$, $p > 0.05$ at 3 degrees of freedom (df); D1 - $X^2 = 10.4$, $p > 0.05$ at 3 df; S1.5 - $X^2 = 15.6$, $p > 0.05$ at 3 df; S2 - $X^2 = 15.7$, $p > 0.05$ at 3 df; and T - $X^2 = 8.7$, $p > 0.05$ at 3 df.

There are no statistically significant differences between the total mean canopy cover of the four treatments: $X^2 = 18.3$, $p > 0.05$ at 3 degrees of freedom (df).

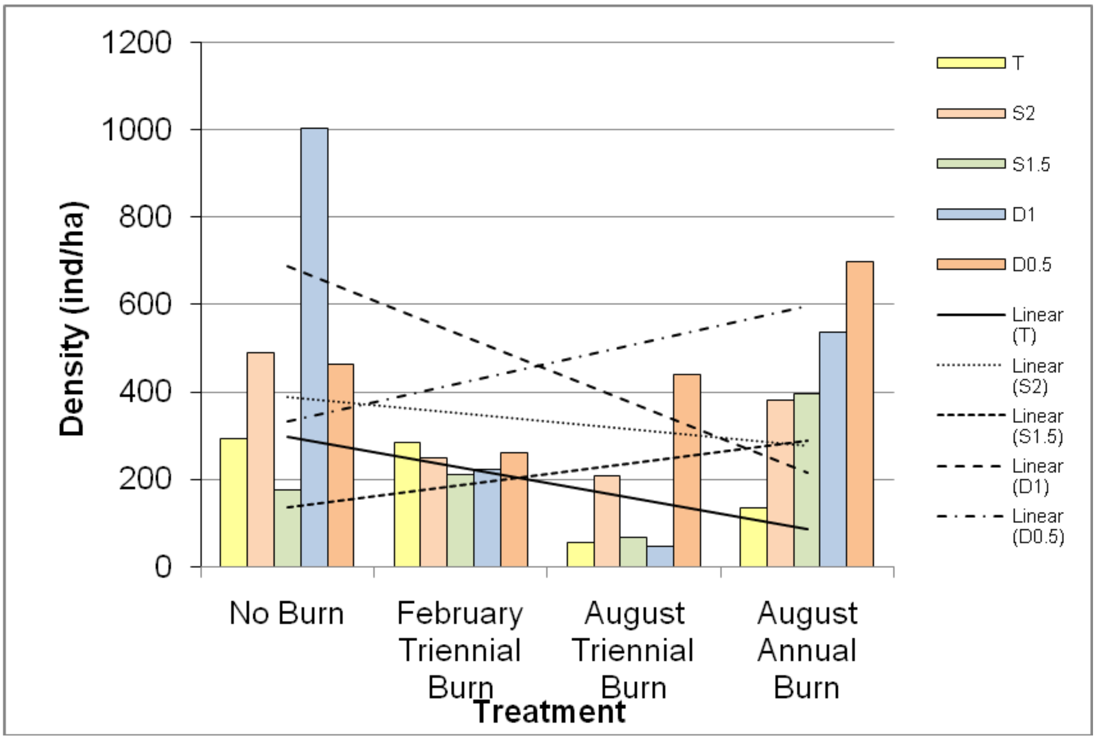

Figure 4.8: The mean density (ind/ha), in each woody height class for each treatment located in the Mopani EBP, Kruger National Park.

The total mean woody densities for each treatment in the Satara EBP are the following: No Burn treatment, 1 233 ind/ha; February Triennial Burn, 2 133 ind/ha; August Triennial Burn, 828 ind/ha; and August Annual Burn, 2 151 ind/ha.

There are statistically significant differences between the four treatments within the following height classes: D0.5 - $X^2 = 206$, $p < 0.05$ at 3 degrees of freedom (df); D1 - $X^2 = 1165$, $p < 0.05$ at 3 df; S1.5 - $X^2 = 262$, $p < 0.05$ at 3 df; S2 - $X^2 = 86.4$, $p < 0.05$ at 3 df; and T - $X^2 = 210.3$, $p < 0.05$ at 3 df.

4.1.5 Summary of the fire treatments in each Experimental Burn Plot, with an indication of distribution of palatability.

Syntheses of the results presented in this chapter are provided in Tables 4.33, 4.34, 4.35 and 4.35. These tables indicate the total mean canopy cover, total mean densities and the distribution of palatability between mean canopy cover and mean density for each treatment and growth forms within each EBP. As this is a summary of the results height class codes D0.5 and D1 (dwarf shrubs) as well as S1.5 and S2 (shrubs) have been grouped together.

Table 4.33: A summary of the results obtained in the different fire treatments occurring in the Pretoriuskop Experimental Burn Plot, Kruger National Park

Treatment	No Burn		February Triennial Burn		August Triennial Burn		August Annual Burn	
Mean canopy cover (%)								
Trees[1]	16.4		12.2		7.8		10	
Shrubs[2]	15.7		12.4		11.7		11.4	
Dwarf shrubs[3]	7.3		7.7		12		10.8	
Total	39.4		32.2		31.5		32.2	
Mean density (ind/ha)								
Trees	278		137		199		228	
Shrubs	1 456		1 131		712		790	
Dwarf shrubs	1 690		1 570		1 530		1 845	
Total	3 422		2 840		2 441		2 863	
Mean Canopy cover (%) P[4]/UP[5]								
	P	UP	P	UP	P	UP	P	UP
Trees	3.3	13.1	3.4	8.8	4.5	3.3	4.5	5.5
Shrubs	5.5	10.2	2.4	9.9	5.9	5.8	4.8	6.6
Dwarf shrubs	3.3	4	2.7	5	7.6	4.4	6.7	4.1
Total	12.1	27.3	8.5	23.7	18	13.5	16	16.2
Mean density (ind/ha) P/UP								
	P	UP	P	UP	P	UP	P	UP
Trees	98	178	66	71	120	79	172	56
Shrubs	478	978	269	862	362	350	382	408
Dwarf shrubs	694	996	604	968	714	816	1 350	495
Total	1 270	2 152	939	1 901	1 196	1 245	1 904	959

[1]Trees >2 m, [2]Shrubs >1 m – 2 m, [3]Dwarf shrubs 0 m – 1 m
[4]Palatable, [5]Unpalatable

Table 4.34: A summary of the results obtained in the different fire treatments occurring in the Skukuza Experimental Burn Plot, Kruger National Park

Treatment	No Burn		February Triennial Burn		August Triennial Burn		August Annual Burn	
Mean canopy cover (%)								
Trees[1]	6.9		9.3		3.7		2.6	
Shrubs[2]	6.1		4.8		3.5		3.4	
Dwarf shrubs[3]	3.8		4.4		2		3.6	
Total	16.8		18.5		9.3		9.6	
Mean density (ind/ha)								
Trees	132		236		75		57	
Shrubs	941		672		502		219	
Dwarf shrubs	1 438		1 046		428		789	
Total	2 511		1 954		1 005		1 065	
Mean canopy cover (%) P[4]/UP[5]								
	P	UP	P	UP	P	UP	P	UP
Trees	3.4	3.5	4.7	4.6	2.2	1.5	2.2	0.4
Shrubs	4.3	1.8	3.1	1.7	2.7	0.8	2	1.4
Dwarf shrubs	2.7	1.1	2.6	1.8	1.3	0.7	2.7	0.9
Total	10.4	6.4	10.4	8.1	6.2	3	6.9	2.7
Mean density (ind/ha) P/UP								
	P	UP	P	UP	P	UP	P	UP
Trees	59	73	158	18	51	24	48	9
Shrubs	891	50	455	217	359	143	199	20
Dwarf shrubs	1 119	319	652	394	346	82	691	98
Total	2 069	442	1 265	689	756	249	938	127

[1]Trees >2 m, [2]Shrubs >1 m – 2 m, [3]Dwarf shrubs 0 m – 1 m
[4]Palatable, [5]Unpalatable

Table 4.35: A summary of the results obtained in the different fire treatments occurring in the Satara Experimental Burn Plot, Kruger National Park

Treatment	No Burn		February Triennial Burn		August Triennial Burn		August Annual Burn	
Mean canopy cover (%)								
Trees[1]	1.1		1		2.4		0.5	
Shrubs[2]	2.1		3.3		1.5		0.5	
Dwarf shrubs[3]	1.1		2		2.1		1.9	
Total	4.3		6.3		6		2.9	
Mean density (ind/ha)								
Trees	77		58		10		81	
Shrubs	349		449		50		119	
Dwarf shrubs	759		1 590		1 369		1 282	
Total	1 185		2 097		1 429		1 482	
Mean canopy cover (%) P[4]/UP[5]								
	P	UP	P	UP	P	UP	P	UP
Trees	1.1	-	0.9	0.1	2.4	-	0.5	-
Shrubs	2	0.1	1.2	2.1	1.2	0.3	0.4	0.1
Dwarf shrubs	0.6	0.5	0.8	1.2	1.2	0.9	1.3	0.6
Total	3.7	0.6	2.9	3.4	4.8	1.2	2.2	0.7
Mean density (ind/ha) P/UP								
	P	UP	P	UP	P	UP	P	UP
Trees	69	8	50	8	10	-	45	36
Shrubs	152	197	277	172	50	-	83	36
Dwarf shrubs	326	433	357	1 233	978	391	626	656
Total	547	638	684	1 413	1 038	391	754	728

[1]Trees >2 m, [2]Shrubs >1 m – 2 m, [3]Dwarf shrubs 0 m – 1 m
[4]Palatable, [5]Unpalatable

Table 4.36: A summary of the results obtained in the different fire treatments occurring in the Mopani Experimental Burn Plot, Kruger National Park

Treatment	**No Burn**		**February Triennial Burn**		**August Triennial Burn**		**August Annual Burn**	
			Mean canopy cover (%)					
Trees[1]	12		12.2		5.2		4.6	
Shrubs[2]	8.5		7.2		8.3		13.7	
Dwarf shrubs[3]	0.9		1.3		1.7		6.4	
Total	21.4		20.7		15.2		24.7	
			Mean density (ind/ha)					
Trees	285		30		57		30	
Shrubs	461		426		278		426	
Dwarf shrubs	487		1 470		488		585	
Total	1 233		1 926		823		1 041	
			Mean canopy cover (%) P[4]/UP[5]					
	P	UP	P	UP	P	UP	P	UP
Trees	11.7	0.3	12.2	-	5.2	-	4.6	-
Shrubs	8.4	0.1	7.2	-	8	0.3	13.7	-
Dwarf shrubs	0.8	0.1	1.2	0.1	1.6	0.1	6.4	-
Total	20.9	0.5	20.6	0.1	14.8	0.4	24.7	-
			Mean density (ind/ha) P/UP					
	P	UP	P	UP	P	UP	P	UP
Trees	284	-	30	-	57	-	30	-
Shrubs	392	69	426	-	278	-	426	-
Dwarf shrubs	376	111	995	475	488	-	585	-
Total	1 052	180	1 451	475	823	-	1 041	-

[1]Trees >2 m, [2]Shrubs >1 m – 2 m, [3]Dwarf shrubs 0 m – 1 m
[4]Palatable, [5]Unpalatable

CHAPTER 5: DISCUSSION

5.1 Dominance, structure and density of woody species recorded in the Experimental Burn Plots

Changes and trends in woody dominance, structure (growth forms and mean canopy cover) and mean density (ind/ha) between the different fire treatments will be discussed with special reference to the palatability and availability of browsable material for each broad Savanna type (Experimental Burn Plot).

5.2.1 Pretoriuskop Experimental Burn Plot

Van der Schijff (1958:26) described the vegetation of the Pretoriuskop EBP as large-leaved deciduous woodland with tall grass and dominant woody plants being *Dichrostachys cinerea* (palatable) and *Terminalia sericea* (unpalatable). Gertenbach (1983:10) classified the vegetation of the Pretoriuskop EBP as the Lowveld Sour Bushveld of Pretoriuskop compromising of sandy granitic soils, dominated by the woody *Terminalia sericea* and *Dichrostachys cinerea*. The Pretoriuskop EBP's vegetation has been classified by Mucina & Rutherford (2006:497) as the Pretoriuskop Sour Bushveld (SVl 10), as previously discussed. The palatability of the dominant woody species occurring in the Pretoriuskop EBP is summarized in Table 5.1.

Table 5.1: Palatability of the dominant woody species within the different treatments, occurring in the Pretoriuskop Experimental Burn Plot (* indicates presence)

Species name	**Treatment**	**Dominant height class**	**Palatability**	
			P[1]	**UP[2]**
Antidesma venosum	No Burn	T	*	
Cassia abbreviata subsp. *beareana*	AB3[3]	D1	*	
	AB1[4]	D0.5 & D1		
Combretum collinum subsp. *gazense*	FB3[5]	T	*	
	AB1	D0.5		
Dichrostachys cinerea	No Burn	All	*	
	FB3	All		
	AB3	All		
	AB1	All		
Diospyros mespiliformis	No Burn	S1.5	*	
Euclea natalensis subsp. *angustifolia*	No Burn	S1.5		*
	AB3	S1.5		
Grewia bicolor	AB3	D0.5	*	
Gymnosporia buxifolia	No Burn	S2 & T		*
Sclerocarya birrea subsp. *caffra*	FB3	T	*	
	AB3	T		
	AB1	T		
Terminalia sericea	No Burn	All		*
	FB3	All		
	AB3	All		
	AB1	All		

[1]Palatable, [2]Unpalatable
[3]August Triennial Burn, [4]August Annual Burn, [5]February Triennial Burn

The woody component of this EBP, representing the Pretoriuskop Sour Bushveld (SVl 10) was, irrespective of the applied fire treatment, dominated across all growth forms and height classes by the unpalatable *Terminalia sericea* and palatable *Dichrostachys cinerea* (Table 5.1). These results were similar to the results described by O'Regan (2005:V), Van der Schijff (1958:26); Gertenbach (1983:10); and Mucina & Rutherford (2006:497).

The No Burn treatment had a mean total mean woody canopy cover of 39.4% with the bulk of the cover being evenly spread between the shrub and tree layer (Figure 4.1). Of the total mean canopy cover, 27.3% was unpalatable and 12.1% palatable (Table 4.33). Mean density (ind/ha) was highest in the dwarf shrub and shrub layers (Figure 4.2), suggesting increased competition between browsers, especially in this vegetation unit with limited palatable browse. The results confirm the limitations in browse due to the sour nature of this savanna unit as the palatability and nutritional value of sour bushveld decreases after plants reach maturity, particularly in the dry seasons (Van Rooyen, 2010a:45; Van Rooyen, 2010b:784).

Burning, irrespective of the frequency or time of burning, reduced the total mean woody canopy cover, as well as the cover of the tree and shrub layers when compared to the No Burn treatment (Figure 4.1). Fire however, throughout all the treatments, led to an increase in the mean canopy cover of the dwarf shrub layer (Figure 4.1). The same trend was recorded by Devine, *et al*. (2015:475) with the No Burn treatment having the highest mean canopy cover when compared to the other treatments. Considering the rather unpalatable nature of this Sour Savanna vegetation unit, it is possible that fire either renders more herbaceous (grass) species acceptable by removing moribund material or providing “green bite” with an expected increase in grazing pressure (Trollope, 1999:237). This regular increase in grazing pressure might be an advantage for woody seedling recruitment and establishment by decreasing herbaceous competition (Shackleton & Scholes, 2000:79) which would explain the increase in dwarf shrub cover. The August Triennial Burn was the only treatment where the mean canopy cover of palatable species (18%) was greater than that of the unpalatable species (13.5%) (Table 4.33). This was caused by the increase in mean canopy cover of *Dichrostachys cinerea*, across all growth forms and height classes (Table 4.5).

The total mean density of the No Burn treatment was 3 422 ind/ha of which 2 152 ind/ha were unpalatable and 1 270 ind/ha palatable (Table 4.33). O'Regan (2005:V) found that the exclusion of fire in the Pretoriuskop Sour Bushveld (SVI 10) caused an increase in mean woody density. The same trend was found in this study irrespective of the fire regime. All fire treatments showed a decrease in total mean woody density (Figure 4.2) when compared to the No Burn treatment, with only dwarf shrubs increasing by 155 ind/ha. The August Triennial Burn showed the most significant ($p < 0.05$) decrease in mean woody density. Bodini & Clerici (2016:43) suggest that this was possibly as a result of the increase in grass production, thus increasing the fire intensity which could then result in the reduction of woody individuals.

Using the definition of woody thickening or encroachment occurring at ≥ 1 500 ind/ha of (Richter, Snyman & Smit, 2001:108), all the fire treatments in this EBP were encroached with the August Triennial Burn having the lowest mean woody density of 2 441 ind/ha. Although mean woody density decreased with fire, mean woody density was still high. This could be attributed to the increase in coppicing and/or germination of species post fire, as the mean density was greatest in the dwarf shrub growth form (Shackleton & Scholes, 2000:79).

Higgins, *et al*. (2007:1122) found that the August Triennial Burn and August Annual Burn had the highest small tree dominance, and the February Triennial Burn showed a decrease in small tree dominance. This differed slightly with the mean density of dwarf shrubs only increasing in the August Annual Burn. This difference was attributed to the use of only two height classes, namely anything less than or greater than two meters, by Higgins, *et al*. (2007:1120).

As with mean canopy cover, fires occurring in August had a higher total mean density of palatable woody species than unpalatable when compared to the No Burn- and February Triennial Burn treatments. These treatments had a higher number of palatable shrubs (August Triennial Burn) and palatable dwarf shrubs (August Annual Burn). *Dichrostachys cinerea* produces a large number of seeds, which could stay dormant in the soil for up to five years (Mudzengi *et al*. 2014:52) and as a result this could have caused the increase in the mean density of this palatable species (Table 4.6).

The introduction of fire, which decreased mean woody canopy cover and mean density, favourably changed the woody species ratio of unpalatable to palatable, with the August treatments providing the highest browse potential, considering both the structure and density of the palatable woody component. This would result in less competition between browsers, compared to the No Burn treatment. The dominant woody height classes favour browsers like, Black Rhino, Bushbuck, Eland, Elephant, Giraffe, Kudu, Grey Duiker, Grey Rhebok, Impala, Klipspringer, Nyala, Steenbok, Suni and Sharpe’s Grysbok.

5.2.2 Skukuza Experimental Burn Plot

The vegetation of the Skukuza EBP was described by Van der Schijff (1958:64-66) as *Combretum* veld dominated by the palatable tree species *Combretum apiculatum*; *C. collinum*; *C. zeyheri*; *Sclerocarya birrea* subsp. *caffra* and *Senegalia nigrescens*. Unpalatable woody species included *Terminalia sericea*. Gertenbach (1983:21-22) classified the vegetation of the Skukuza EBP as thickets of the Sabie and Crocodile River which is dominated by the palatable woody species *Combretum apiculatum*; *Senegalia nigrescens*; *Dichrostachys cinerea*; *Grewia bicolor* and *G. flavescens* and *Spirostachys africana*. Unpalatable woody species included *Euclea divinorum* and *Terminalia prunioides*. Mucina & Rutherford (2006:492) described the vegetation unit of the Skukuza EBP as the Granite Lowveld (SVI 3) dominated by trees greater than 10 m, as previously discussed. Palatability of the dominant woody species occurring in the Skukuza EBP is given in Table 5.2.

Table 5.2: Palatability of the dominant woody species within the different treatments, occurring in the Skukuza Experimental Burn Plot (* indicates presence)

Species name	Treatment	Dominant height class	Palatability	
			P[1]	UP[2]
Combretum apiculatum subsp. *apiculatum*	FB3[3]	D1, S1.5, S2 & T	*	
	AB1[4]	S1.5 & T		
Combretum collinum subsp. *gazense*	No Burn	S1.5 & T	*	
	FB3	T		
	AB3[5]	S1.5 & T		
	AB1	S1.5, S2 & T		
Dalbergia melanoxylon	No Burn	D1 & T	*	
Dichrostachys cinerea	FB3	S1.5, S2 & T	*	
Euclea divinorum	No Burn	S2		*
Euclea natalensis subsp. *angustifolia*	No Burn	T		*
Peltophorum africanum	FB3	T		*
Spirostachys africana	FB3	T		*
Strychnos madagascariensis	AB3	D0.5, D1 & S1.5	*	
	AB1	D1		
Terminalia sericea	No Burn	T		*
	FB3	All		
	AB3	T		
	AB1	D1, S1.5 & T		

[1]Palatable, [2]Unpalatable
[3]February Triennial Burn, [4]August Annual Burn, [5]August Triennial Burn

This study found the woody component of the No Burn treatment in the Skukuza EBP to be dominated by plants in the shrub and tree growth forms, particularly the unpalatable *Terminalia sericea* and *Euclea* species (Table 5.2). The three fire treatments have caused a change in the dominant woody species with *Terminalia sericea* no longer dominant and *Combretum species* and *Strychnos madagascariensis* increasing within all the growth forms and height classes (Table 5.2). These results reflect work done by Mucina & Rutherford (2006:492); Van der Schijff (1958:64-66); and Gertenbach (1983:21-22).

The total mean woody canopy cover of the No Burn treatment was 16.8% with primarily shrubs and trees contributing to this cover (Figure 4.3). Palatable and unpalatable woody species contributed 10.4% and 6.4%, respectively (Table 4.34). The change in the palatability of this vegetation unit when compared to the Pretoriuskop Sour Bushveld (SVI 10) was because the Granite Lowveld (SVI 3) has a lower mean annual rainfall and therefore is considered to be a Mixed Bushveld. This vegetation unit is thus considered as a transition zone between the sweet and sour bushveld with forage potentially occurring for longer time spans, compared to the Sour Bushveld associated with the Pretoriuskop EBP (Van Rooyen, 2010b:785).

The total mean woody canopy cover was influenced by the season of burning. The February Triennial Burn showed an increase in mean canopy cover in all the layers except the shrub layer. The August burns however caused a decrease of 7.5% in mean canopy cover, when compared to the No Burn treatment (Figure 4.3). This is probably as a result of the increase in fire intensity resulting in an increased “topkill” of woody species as suggested by Enslin, *et al*. (2000:35). This differed slightly from the results of Devine, *et al*. (2015:475) who found that the No Burn treatment had the highest mean woody canopy cover when compared to the other treatments. This slight difference in results was attributed to the use of modelling by Devine, *et al*. (2015:475) to analyze the woody data.

The No Burn treatment had a total mean woody density of 2 511 ind/ha with dwarf shrubs contributing the most (Figure 4.4). The majority of woody individuals (2 069 ind/ha) were palatable, with only 1 270 in/ha considered as unpalatable (Table 4.34). Devine, *et al*. (2015:475) found that the introduction of fire, and not frequency of fire, caused a decrease in mean density across all treatments. This study showed that the introduction of fire significantly ($p < 0.05$) reduced the total mean woody density, but the August burns showed a reduction of approximately half the total mean woody density when compared to the No Burn treatment (Figure 4.4). As with mean canopy cover, the reduction of mean woody density was as a result of the higher intensity of fires in the August burns causing a greater "topkill" of woody individuals (Enslin, *et al*. 2000:35).

The season of burning affected the influence of encroaching species in this savanna unit. Treatments having densities >1 500 ind/ha were the No Burn treatment and February Triennial Burn and were thus encroached (Richter, Snyman & Smit (2001:108).

The fire intensity in the August burns was potentially greater than that of the February Triennial Burn (Govender, Trollope & Van Wilgen, 2006:752) and this would prevent the growth of woody individuals to strata higher than the dwarf shrub and shrub layers (Enslin, *et al*. 2000:35). The mean density of the tree layer only increased in the February Triennial Burns, with the dwarf shrub, shrub and tree layer decreasing in the August burns (Figure 4.4), when compared to the No Burn treatment.

The introduction of fire, which decreased mean woody canopy cover and mean density, favourably changed the woody species ratio of unpalatable to palatable. The February Triennial Burn provided the highest browse potential in terms of both structure and density and the palatable woody component was evenly spread across all the growth forms and height classes. As a result, there will be less competition between browsers, as there is available browse at different heights. Therefore, the dominant woody height classes favour browsers like Black Rhino, Bushbuck, Eland, Elephant, Giraffe, Kudu, Grey Duiker, Grey Rhebok, Impala, Klipspringer, Nyala, Steenbok, Suni and Sharpe’s Grysbok.

5.2.3 Satara Experimental Burn Plot

Van der Schijff (1958:67) described the vegetation of the Satara EBP as the *Senegalia nigrescens*/*Sclerocarya birrea* bushveld community dominated by the palatable *Senegalia nigrescens*; *Sclerocarya birrea* subsp. *caffra* and *Dichrostachys cinerea* and unpalatable *Ormocarpum trichocarpum* and *Ehretia amoena*. Gertenbach (1983:62) described the vegetation of the Satara EBP as the *Sclerocarya birrea*/*Senegalia nigrescens Savanna* dominated by *Sclerocarya birrea* subsp. *caffra*; *Senegalia nigrescens*; *Dichrostachys cinerea*; and *Vachellia nilotica*. Mucina & Rutherford (2006:493-494) classified the vegetation of this EBP as the Tshokwane-Hlane Basalt Lowveld (SVI 5). A summary of the palatability of the dominant woody species occurring in the Satara EBP is provided in Table 5.3.

Table 5.3: Palatability of the dominant woody species within the different treatments, occurring in the Satara Experimental Burn Plot (* indicates presence)

Species name	Treatment	Dominant height class	Palatability	
			P[1]	UP[2]
Combretum imberbe	AB3[3]	T	*	
Commiphora africana subsp. africana	No Burn	S2	*	
Dichrostachys cinerea	FB3[4]	S1.5 & S2	*	
	AB3	D0.5, D1 & S1.5		
	AB1[5]	D0.5		
Flueggea virosa subsp. *virosa*	FB3	S1.5	*	
Maerua edulis	FB3	D1	*	
Senegalia nigrescens	AB3	T	*	
Vachellia exuvialis	No Burn	S2	*	

[1]Palatable, [2]Unpalatable
[3]August Triennial Burn, [4]February Triennial Burn, [5]August Annual Burn

The woody component of this EBP had been altered slightly to that described by Van der Schijff (1958:67), Gertenbach (1983:62) and Mucina & Rutherford (2006:493-494) with *Sclerocarya birrea* subsp. *caffra* no longer dominant in any of the treatments, growth forms, and height classes. All dominant species occurring in this EBP were palatable (Table 5.3), with the introduction of fire resulting in the increased dominance of *Dichrostachys cinerea* due to the large number of seeds produced and a seed dormancy of up to five years (Mudzengi *et al*. 2014:52).

The No Burn treatment had a total mean woody canopy cover of only 4.3%, suggesting limited browse volumes in this vegetation unit. The majority of the mean canopy cover occurred in the shrub layer (Figure 4.5). Of the total mean canopy cover 3.7% was palatable and 0.6% unpalatable (Table 4.35). The high palatability of woody species, in terms of mean woody canopy cover, is attributed to the Sweetveld nature of the Tshokwane-Hlane Basalt Lowveld (SVI 5). In a “sweet” bushveld, species maintain their palatability through-out their life cycle (Van Rooyen, 2010a:44), this is normally seen with grasses but can also be attributed to young woody species like *Senegalia nigrecens* which retain some of their leaves over the dry season (Smit, Rethman & Moore, 1996:79).

The two triennial burns increased the total mean woody canopy cover but the August Annual Burn treatment caused a reduction of 1.4% mean woody canopy cover when compared to the No Burn treatment (Figure 4.5). The same trend was described by Smit, *et al.* (2010:1872), where the introduction of fire into the system resulted in a reduction of the mean woody canopy cover, with the high intensity fires resulting in the reduction of woody individuals (Enslin, *et al*. 2000:35).

Woody seedlings have a greater chance of survival in burnt areas, due to the grass layer being removed by both fire and herbivory, thus reducing competition (Shackleton & Scholes, 2000:79). The increase in fire intensity, only achieved by a longer fire-return period to allow a buildup of fuel, prevents smaller woody plants from developing into larger ones (Enslin, *et al*. 2000:35). This was seen throughout the three burnt treatments. The introduction of fire increased the mean canopy cover of the dwarf shrub layer in all three burnt treatments, with the shrub layer only increasing in the February Triennial Burn and tree layer increasing only in the August Triennial Burn (Figure 4.5). The increase of the dwarf shrub layer could potentially be due to the grass layer being removed, thus reducing competition between the grass and tree layers, therefore favouring the woody component (Trollope, 1999:237).

The mean density of the No Burn treatment was 1 185 ind/ha with dwarf shrubs largely contributing (Figure 4.6), of which 638 ind/ha were unpalatable and 547 ind/ha considered as palatable (Table 4.35). The introduction of fire significantly ($p < 0.05$) increased the mean woody density of the three burnt treatments (Figure 4.6). Using the definition of woody thickening and/or encroachment of Richter, Snyman & Smit (2001:108), only the February Triennial Burn treatment was encroached (>1 500 ind/ha). This is as a result of the increased dwarf shrub layer, due to the increase in woody seedling germination and coppicing after fire (Shackleton & Scholes, 2000:79), with the greatest increase occurring in the February Triennial Burn.

Enslin, *et al*. (2000:35) found that the density of trees was greatest in the February Triennial Burn, which differed with the results found in this study, namely, the tree density decreased in the February Triennial Burn and then increased in the August burns. Enslin *et al*. (2000:28) surveyed all the replicates in 1998, with the current study only surveying three of the four replicates with a 20-year gap between studies. Enslin *et al*. (2000:28) study showed that the density of a particular species was only determined by the number of individuals found within transects and not the number of individuals per hectare. The fluctuation in annual rainfall, due to five droughts occurring between 1998 and 2017 (Phaduli, 2018:40), could be another contributing factor to the differences found between these studies.

Palatable woody species occurred throughout all the treatments, but the introduction of fire, which increased mean woody canopy cover and mean density, favourably changed the woody species ratio of unpalatable to palatable, with the

August Triennial Burn treatment providing the highest browse potential, considering both the structure and density of the palatable woody component. Both mean canopy cover and mean density of the shrub layer were lower than what was recorded in the No Burn and February Triennial Burn treatments (Figures 4.6 and 4.7) The dominant woody height classes favour browsers like Black Rhino, Bushbuck, Eland, Elephant, Giraffe, Kudu, Grey Duiker, Grey Rhebok, Impala, Klipspringer, Nyala, Steenbok, Suni and Sharpe's Grysbok.

5.2.4 Mopani Experimental Burn Plot

The vegetation of the Mopani EBP was described by Van der Schijff (1958:72) as the Mopane Veld dominated by the palatable *Colophospermum mopane*, *Senegalia nigrescens* and *Combretum imberbe*, and the unpalatable *Terminalia prunioides*. The vegetation of the Mopani EBP was classified by Gertenbach (1983:83) as the *Colophospermum mopane* shrubveld dominated by *Colophospermum mopane* with other species rarely occurring. Mucina & Rutherford (2006:486) described the vegetation of the area representing this EBP as Mopane Basalt Shrubland (SVmp 4). Table 5.4 provides a summary of the palatability of the dominant woody species, namely *Colophospermum mopane*. *The* Mopane Basalt Shrubland is considered to be the most arid of the four vegetation units, due to the low mean annual rainfall the area receives (Higgins, *et al*. 2007:1120). This Sweet Savanna unit, similar to the Tshokwane-Hlane Basalt Lowveld (SVl 5), has grass species which retain their nutritional value throughout their mature stages (Van Rooyen. 2010b:784).

Table 5.4: Palatability of the dominant woody species within the different treatments, occurring in the Mopani Experimental Burn Plot (* indicates presence)

Species name	Treatment	Dominant height class	Palatability	
			P[1]	UP[2]
Colophospermum mopane	No Burn	S1.5, S2 & T	*	
	FB3[3]	S1.5, S2 & T		
	AB3[4]	All		
	AB1[5]	All		

[1]Palatable, [2]Unpalatable
[3]February Triennial Burn, [4]August Triennial Burn, [5]August Annual Burn

The woody component of the Mopani EBP was, irrespective of the applied fire treatment, dominated by *Colophospermum mopane* (Table 5.4). This follows the description of Gertenbach (1983:83), with other woody species listed by Van der Schijff (1958:72) and Mucina & Rutherford (2006:486) either rarely occurring or absent in this EBP.

The total mean woody canopy cover of the No Burn treatment was higher at 21.4%, compared to the low cover recorded for the No Burn treatment. Trees and shrubs primarily contributed to the mean canopy cover (Figure 4.7). Palatable woody species contributed 20.9% mean canopy cover, with unpalatable woody species only contributing 0.5% cover (Table 4.36). The frequency of burning resulted in a decrease of the mean canopy cover in both the triennial burns, with an increase in cover occurring in the August Annual Burn (Figure 4.7). A study conducted by Smit, *et al*. (2010:1870) showed similar results, with the February Triennial Burn having the lowest cover and, with the August Annual Burn resulting in the highest cover, when compared to the No Burn treatment.

Fire in this Sweet Savanna unit, irrespective of the season or frequency of burning, led to an increase in the mean canopy cover of the woody species in the dwarf shrub layer and a decrease in the cover of the trees in all burn treatments (Figure 4.7). The establishment of the dwarf shrub layer is probably caused by the removal of the grass layer by fire and grazing, thus allowing dwarf shrubs to establish (Shackleton & Scholes, 2000:79). The fire interval may be too frequent, thus maintaining the woody component in the dwarf shrub and shrub layer and not allowing woody individuals to grow before the next fire occurs. (Enslin, *et al*. 2000:35).

The No Burn treatment had a total mean woody density of 1 233 ind/ha with the density being evenly spread, across all height classes and growth forms (Figure 4.8). The majority of the woody individuals (1 052 ind/ha) were palatable with only 180 ind/ha considered as unpalatable (Table 4.36). The February Triennial Burn treatment showed a significant ($p < 0.05$) increase in mean woody density (693 ind/ha), when compared to the No Burn treatment (Figure 4.8). Similar results were obtained by Kennedy & Potgieter (2003:188).

Using the definition of woody thickening or encroachment of Richter, Snyman & Smit (2001:108) the February Triennial Burn was the only treatment where the establishment of woody individuals, especially in the dwarf shrub layer, had resulted in the occurrence of woody encroachment. This is probably as a result of the increase in coppicing and/or post fire germination of species, specifically *Colospermum mopane*, (Shackleton & Scholes, 2000:79; Kennedy & Potgieter, 2003:188). Mean tree density significantly ($p > 0.05$) decreased with fire but mean density of the shrub layer remained constant, when compared to the No Burn treatment (Figure 4.8).

If “grazing potential” was the objective, then a lower mean woody canopy cover (less competition from woody plants on grass layer) would be the answer and any treatment that favoured grasses rather than woody plants would be recommended (Trollope, 1999:320-231). The focus of this study was however to investigate the influence of the different fire treatments on the availability of browse. Although specific fire treatments may have contributed positively to woody structure and density, thus suggesting a higher potential browse, it is important to acknowledge that these changes can also negatively influence browse availability. ITHigh woody densities will restrict animal movement to such a degree than no additional gain in browse is obtained. It may further cause “pseudo droughts” which might have a negative effect on the phenology of the woody plant, such as premature leaf fall and long periods without leaves before resprouting (Smit, Rethman & Moore, 1996:78).

Mopane Basalt Shrubland (SVmp 4) represents Sweetveld and is the most arid savanna unit in comparison to the previous three vegetation units (Kennedy & Potgieter, 2003:182). The woody and grass component of this savanna unit are extremely palatable (Kennedy & Potgieter, 2003:183) and one would expect an effective removal of vegetative cover by both grazers and browsers. Thus, although the August Annual Burn treatment may be seen as favorable in terms of an increase in mean canopy cover of woody species and thus a potential increase in available browse, the removal of the palatable grass layer is unjustified and even risky considering the low and erratic rainfall of these areas. Considering the structure, density and cover of the woody component of the No Burn treatment, it is strongly advised that this Savanna unit not be burned. The vegetation in the unburnt state would favour browsers like Black Rhino, Bushbuck, Eland, Elephant, Giraffe, Kudu, Grey Duiker, Grey Rhebok, Impala, Klipspringer, Nyala, Steenbok, Suni and Sharpe’s Grysbok.

CHAPTER 6: CONCLUSION

Burning or not burning are the two extremes of fire management decisions in the Kruger National Park (KNP). When this question is asked in relation to browse availability, four possible outcomes are evident. Not burning could result in browse forage being abundant in all height classes but with bush thickening occurring, which could exclude some browsers due to their inability to access forage or fear of predation in areas with high woody densities and cover. Extremely intense fires could result in the complete removal of browse forage with a concomitant increase in loss of condition and increased mortality amongst browsers and/or mass migration to unburned areas. In between these two extremes, two other scenarios are evident. The first of these two scenarios is a top-down reduction of trees and some shrubs causing an increase in competition for forage in the lower woody strata. The second scenario is a bottom-up reduction of browse forage availability in the dwarf shrub and shrub layer with lower level browser animals unable to access forage again causing death or migration away from the area. An additional factor to be considered is the effect of fire, in especially the last two scenarios, on the palatability of woody plant species *i.e*. does fire cause an increase or decrease in palatable browse plant species? With these scenarios in mind, the effect of the four different fire treatments on browse availability in each of the four savanna units will be provided here.

Compared to the No Burn treatment, the three fire treatments in the Pretoriuskop Experimental Burn Plot (EBP) caused a reduction in total mean woody canopy cover. Tree and shrub mean canopy cover decreased but dwarf shrub cover increased, especially in the two winter burns. Total mean woody density also decreased across all burn treatments when compared to the control (No Burn) with woody plants in the tree and shrub categories declining in numbers but dwarf shrubs in the August Annual Burn increasing. The February Triennial Burn mimicked the No Burn treatment, having a greater proportion (mean canopy cover and mean density) of unpalatable woody plants to palatable plants in all three height classes. The two winter burns had a positive effect, in all three height classes, of equalizing or even increasing the proportion of palatable plants' mean canopy cover and mean density.

Winter fires have had a top-down effect in the Pretoriuskop EBP causing a reduction in bush thickening and mean canopy cover, especially in the tree and shrub strata and has caused a more equitable proportion of palatable to unpalatable woody plants. Although changing the structure and providing less browse for animals in the tree layer (giraffe and elephant), it appears that winter fires of varying frequencies (one to three years or longer) provide a less dense, more palatable, shorter woody plant layer for use by a large number of browsing species.

The two August fire treatments in the Skukuza EBP reduced the mean total woody canopy cover by 7% and the mean total density by half when compared to the No Burn treatment. Mean canopy cover and mean density across all three height classes were also reduced by these winter burns, but the proportion of palatable woody browse plants compared to the control treatment decreased by more than 50%. Compared to the control treatment, the February Triennial Burn caused a 2%

increase in total mean canopy cover, a 30% reduction in mean total density but, unlike the August burns, provided a much more equitable spread (mean canopy cover and mean density) of palatable woody browse plants in all three height classes.

Intense fires in the August treatments succeeded in reducing mean woody plant density to a non-encroached state but also had the effect of reducing available browse following scenario two above. The February Triennial Burn, although causing a slight increase in mean canopy cover, decreased mean density and provided a much more equitable spread of browsable plants in all three height classes and is thus deemed the most suitable fire treatment in the Skukuza xeric bushveld.

Overall, mean woody canopy cover in the Satara EBP was low, ranging from 2.9% in the August Annual Burn to 6.3% in the February Triennial Burn which was also the only the encroached (≥1 500 ind/ha) treatment. The No Burn treatment and August Annual Burn both reflected the lowest total mean canopy cover as well as an almost 1:1 mean density ratio of palatable to unpalatable woody plants. A comparison of the two triennial treatments reflects a very high proportion of unpalatable to palatable densities in the February Triennial Burn but the opposite trend in the August Triennial Burn providing a mean density ratio of 2:1 (palatable vs unpalatable). Therefore, this last-mentioned burn treatment is recommended since it provides forage to most browsing species.

The Mopani EBP August burn treatments reflected a top-down effect by reducing trees quite drastically and increasing shrub and dwarf shrub mean canopy cover and mean density. The February Triennial Burn caused bush encroachment primarily as a result of a very high mean density of dwarf shrubs. The No Burn treatment provided a non-encroached area with a high mean density and even spread of palatable woody browse plants and as such it is recommended that Mopane veld not be burned as it provides forage for most browser species.

This study has provided a detailed and repeatable baseline for monitoring the effect of fire on browse accessibility and acceptability in the KNP. The importance of fires in our savanna ecosystems is once again illustrated by the results of this study. Fire contributed positively to both the availability and or the palatability of browse and has reduced bush encroachment in three of the four savanna types in the Kruger National Park.

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ANNEXURE A: Species cover relationships for the Pretoriuskop Experimental Burn Plot

No Burn treatment

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	Ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Antidesma venosum	D1	0.13	0.74	31	322.563	20.266	19.526
Cassia abbreviata subsp. beareana	D0.5	0.27	0.599	94	105.4993	11.59	10.991
Cassia abbreviata subsp. beareana	D1	0.17	0.74	38	258.0504	18.126	17.386
Catunaregam spinosa	D1	0.1	1.04	11	849.4868	32.888	31.848
Dichrostachys cinerea	D0.5	0.74	0.646	226	44.2461	7.506	6.86
Dichrostachys cinerea	D1	0.57	1.04	67	149.0328	13.775	12.735
Diospyros lycioides subsp. sericea	D1	0.03	0.74	7	1290.2521	40.531	39.791
Euclea divinorum	D1	0.2	0.89	32	311.057	19.901	19.011
Grewia bicolor	D1	0.03	1.19	2	3336.6069	65.179	63.989
Grewia flavescens	D0.5	0.03	1.19	2	3336.6069	65.179	63.989
Gymnosporia buxifolia	D0.5	0.17	0.559	59	168.7988	14.66	14.062
Parinari curatellifolia	D1	0.03	0.74	7	1290.2521	40.531	39.791
Pavetta schumanniana	D1	0.04	0.74	8	1172.9565	38.645	37.905
Philenoptera violacea	D0.5	0.03	1.19	2	3336.6069	65.179	63.989
Sclerocarya birrea subsp. caffra	D1	0.03	0.74	7	1290.2521	40.531	39.791
Sclerocarya birrea subsp. caffra	D0.5	0.1	0.74	23	430.084	23.401	22.661
Strychnos madagascariensis	D0.5	0.07	0.599	23	421.9971	23.18	22.581
Terminalia sericea	D0.5	0.87	0.796	175	56.9341	8.514	7.718
Terminalia sericea	D1	1.07	0.965	146	68.1412	9.315	8.35
Catunaregam spinosa	D0.5	0.07	0.599	23	421.9971	23.18	22.581
Combretum collinum subsp. gazense	D0.5	0.04	0.74	8	1172.9565	38.645	37.905
Dalbergia melanoxylon	D0.5	0.1	0.646	30	327.421	20.418	19.772
Euclea divinorum	D0.5	0.17	0.599	59	168.7988	14.66	14.062
Parinari curatellifolia	D0.5	0.03	1.19	2	3336.6069	65.179	63.989
Pavetta schumanniana	D1	0.3	1.19	27	366.6601	21.607	20.417
Psydrax locuples	D1	0.2	0.74	46	215.042	16.547	15.807
Dalbergia melanoxylon	D1	0.2	0.646	61	163.7105	14.438	13.792
Diospyros mespiliformis	D1	0.13	0.74	31	322.563	20.266	19.526
Euclea natalensis subsp. angustifolia	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Flueggea virosa subsp. virosa	D0.5	0.17	0.74	38	258.0504	18.126	17.386
Flueggea virosa subsp. virosa	D1	0.2	1.04	23	424.7434	23.255	22.215
Gymnosporia buxifolia	D1	0.2	0.769	40	248.6121	17.792	16.996
Lantana camara	D0.5	0.03	0.17	146	68.094	9.311	9.141
Ozoroa sphaerocarpa	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Ozoroa sphaerocarpa	D1	0.03	1.19	2	3336.6069	65.179	63.989
Searsia pyroides var. pyroides	D1	0.03	1.19	2	3336.6069	65.179	63.989
Strychnos madagascariensis	D1	0.07	0.551	29	341.0518	20.838	20.287
Zanthoxylum humile	D1	0.13	0.74	31	322.563	20.266	19.526
Combretum molle	D1	0.03	1.19	2	3336.6069	65.179	63.989
Solanum panduriforme	D0.5	0.07	0.559	23	421.9971	23.18	22.581
Solanum panduriforme	D1	0.07	0.74	15	645.126	28.66	27.92
Peltophorum africanum	D1	0.03	0.74	7	1290.2521	40.531	39.791
Philenoptera violacea	D1	0	0.74	0	12902.523	128.172	127.432
Psydrax locuples	D0.5	0.03	1.19	2	3336.6069	65.179	63.989
Grewia flavescens	D1	0.03	0.74	7	1290.2521	40.531	39.791

Lantana camara	D1	0	0.457	2	4920.8887	79.155	78.698
Searsia gueinzii	D1	0.03	0.457	20	492.0888	25.031	244.574
Searsia gueinzii	D0.5	0.03	1.19	2	3336.6069	65.179	63.989
Euclea natalensis subsp. angustifolia	D1	0.13	0.74	31	322.563	20.226	19.526
Pappea capensis	D1	0.03	0.74	7	1290.2521	40.531	39.791
Totals for growth form:		7.38	40.43	1718	69237.773	1736.44	1694.01

Shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	Ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	S2	1.45	1.04	170	48.7203	8.647	7.607
Dichrostachys cinerea	S1.5	1.45	1.19	130	76.8803	9.894	8.704
Euclea divinorum	S1.5	0.2	1.04	23	424.7434	23.255	22.215
Euclea divinorum	S2	0.2	1.19	17	556.1012	26.609	25.419
Parinari curatellifolia	S1.5	0	1.93	0	87765.891	334.286	332.356
Rhoicissus tridentata subsp. cuneifolia	S1.5	0.13	1.19	11	834.1517	32.589	31.399
Searsia gueinzii	S1.5	0.07	1.19	5	1668.3035	46.089	44.899
Searsia pyroides var. pyroides	S1.5	0.07	1.19	5	1668.3035	460.089	44.899
Terminalia sericea	S1.5	1.18	1.287	90	110.5016	11.861	10.575
Terminalia sericea	S2	3.39	1.19	305	32.7761	6.46	5.27
Combretum hereroense	S1.5	0.03	1.193	1	8776.5879	105.71	103.78
Diospyros mespiliformis	S2	0.54	1.19	48	207.2427	16.244	15.054
Psydrax locuples	S1.5	0.2	1.04	23	424.7434	23.255	22.215
Psydrax locuples	S2	0.17	0.74	38	258.0504	18.126	17.386
Antidesma venosum	S2	0.13	1.19	11	834.1517	32.589	31.399
Cassia abbreviata subsp. beareana	S1.5	0.07	1.437	4	2315.8149	54.301	52.864
Catunaregam spinosa	S1.5	0.1	0.89	16	622.114	28.144	27.254
Dalbergia melanoxylon	S1.5	0.2	1.287	15	650.1177	28.771	27.484
Diospyros mespiliformis	S1.5	0.57	1.19	51	195.1232	15.762	14.572
Euclea natalensis subsp. angustifolia	S1.5	2.32	1.437	142	69.9743	9.439	8.002
Flueggea virosa subsp. virosa	S1.5	0.2	1.04	23	424.7434	23.255	22.215
Gymnosporia buxifolia	S1.5	0.2	1.04	23	424.7434	23.255	22.215
Manilkara mochisia	S2	0.03	1.19	2	3336.6069	65.179	63.989
Mundulea sericea subsp. sericea	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Mundulea sericea subsp. sericea	S2	0.03	1.93	1	8776.5879	105.71	103.78
Olea europaea subsp. cuspidata	S1.5	0.13	1.19	11	834.1517	32.589	31.399
Olea europaea subsp. cuspidata	S2	0.13	1.93	4	2194.147	52.855	50.925
Pavetta schumanniana	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Sclerocarya birrea subsp. caffra	S2	0.07	1.56	3	2867.0176	60.419	58.859
Jasminum fluminense	S2	0.13	0.74	31	322.563	20.266	19.526
Zanthoxylum humile	S1.5	0.17	0.74	38	258.0504	18.126	17.386
Combretum molle	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Gymnosporia buxifolia	S2	1.24	1.19	111	89.4533	10.672	9.482
Combretum collinum subsp. gazense	S1.5	0	1.93	0	87765.891	334.286	332.356
Searsia gueinzii	S2	0.03	1.93	1	8776.5879	105.71	103.78
Philenoptera violacea	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Sclerocarya birrea subsp. caffra	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Catunaregam spinosa	S2	0.07	1.19	5	1668.3035	46.089	44.899
Dalbergia melanoxylon	S2	0.13	0.74	31	322.563	20.266	19.526
Grewia flavescens	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Peltophorum africanum	S2	0.07	1.56	3	2867.0176	60.419	58.859
Strychnos madagascariensis	S2	0.03	0.74	7	1290.2521	40.531	39.791

Ziziphus mucronata	S2	0.03	1.19	2	3336.6069	65.179	63.989
Antidesma venosum	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Strychnos madagascariensis	S1.5	0	1.19	0	33366.074	206.114	204.924
Combretum molle	S2	0.03	1.19	2	3336.6069	65.179	63.989
Pappea capensis	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Euclea natalensis subsp. angustifolia	S2	0.13	1.19	11	834.1517	32.589	31.399
Diospyros lycioides subsp. sericea	S2	0.03	1.19	2	3336.6069	65.179	63.989
Diospyros lycioides subsp. sericea	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Zanthoxylum humile	S2	0.03	1.19	2	3336.6069	65.179	63.989
Totals for growth form:		15.71	61.457	1487	299159.59	2885.19	2823.73

Trees

Species	Height class code	Mean cover %	Mean can. Dia, (m)	Ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	T	1.75	1.56	91	109.4281	11.804	10.244
Diospyros lycioides subsp. sericea	T	0.03	1.93	1	8776.5879	105.71	103.78
Diospyros mespiliformis	T	0	3.13	0	230834.03	542.132	539.002
Gymnosporia buxifolia	T	0.57	2.16	15	642.8691	542.132	539.002
Sclerocarya birrea subsp. caffra	T	0.3	6.51	0	11095.086	118.856	112.346
Searsia pyroides var. pyroides	T	0.03	3.13	0	23083.402	171.437	168.307
Strychnos madagascariensis	T	0.03	3.13	0	23083.402	171.437	168.307
Terminalia sericea	T	11.82	3.377	132	75.7402	9.82	6.443
Antidesma venosum	T	0.6	2.977	8	1153.4346	38.322	35.346
Psydrax locuples	T	0.1	2.083	2	3408.8459	65.881	63.797
Albizia harveyi	T	0.03	1.93	1	8776.5879	105.71	103.78
Euclea divinorum	T	0.2	1.683	8	1112.7565	37.64	35.957
Olea europaea subsp. cuspidata	T	0.44	3.5	4	2203.3115	52.965	49.465
Peltophorum africanum	T	0.17	1.93	5	1755.3176	47.275	45.345
Ximenia caffra	T	0	1.93	0	87765.891	334.286	332.356
Boscia albitrunca	T	0	1.93	0	87765.891	334.286	332.356
Catunaregam spinosa	T	0.07	1.93	2	4388.2939	74.749	72.819
Dalbergia melanoxylon	T	0.03	3.13	0	23089.402	171.437	168.307
Euclea natalensis subsp. angustifolia	T	0.17	2.53	3	3016.353	61.972	59.442
Combretum molle	T	0.03	1.19	2	3336.6069	65.179	63.989
Pappea capensis	T	0.03	1.19	2	3336.6069	65.179	63.989
Spirostachys africana	T	0	1.93	0	87765.891	334.286	332.356
Totals for growth form:		16.43	54.79	286	616569.69	2948.97	2894.18
Totals for community:		39.51	156.676	3492	984967.06	7570.6	7413.93
Means for community:		0.32	1.274	28	282.0199	61.55	60.276

February Triennial Burn

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	Ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Antidesma venosum	D1	0.03	1.19	2	3336.6069	65.179	63.989
Cassia abbreviata subsp. beareana	D0.5	0.03	1.19	2	3336.6069	65.179	63.989

Cassia abbreviata subsp. beareana	D1	0.03	1.19	2	3336.6069	65.179	63.989
Catunaregam spinosa	D1	0.07	0.965	9	1097.0736	37.374	36.409
Dichrostachys cinerea	D0.5	0.4	0.74	93	107.521	11.7	10.96
Dichrostachys cinerea	D1	0.4	0.74	93	107.521	11.7	10.96
Diospyros lycioides subsp. sericea	D1	0.03	0.74	7	1290.2521	40.531	39.791
Euclea divinorum	D1	0.03	1.19	2	3336.6069	65.179	63.989
Grewia bicolor	D1	0.03	1.19	2	3336.6069	65.179	63.989
Grewia flavescens	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Gymnosporia buxifolia	D0.5	0.2	0.551	83	119.3681	12.328	11.777
Annona senegalensis subsp. senegalensis	D0.5	0.07	0.965	9	1097.0736	37.374	36.409
Annona senegalensis subsp. senegalensis	D1	0.03	1.19	2	3336.6069	65.179	63.989
Parinari curatellifolia	D1	0.17	1.19	14	667.3214	29.149	27.959
Pavetta schumanniana	D0.5	0.07	0.599	23	421.9971	23.18	22.581
Rhoicissus tridentata subsp. cuneifolia	D0.5	0.03	0.282	53	187.374	15.446	15.164
Sclerocarya birrea subsp. caffra	D1	0.03	0.74	7	1290.2521	40.531	39.791
Sclerocarya birrea subsp. caffra	D0.5	0.07	0.511	32	307.6259	19.791	19.28
Strychnos madagascariensis	D0.5	0.17	0.599	59	168.7988	14.66	14.062
Terminalia sericea	D0.5	1.65	0.74	382	26.1185	5.767	5.027
Terminalia sericea	D1	1.65	1.19	148	67.5427	9.274	8.084
Catunaregam spinosa	D0.5	0.07	0.965	9	1097.0736	37.374	36.409
Combretum collinum subsp. gazense	D0.5	0.17	0.74	38	258.0504	18.126	17.386
Combretum molle	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Dalbergia melanoxylon	D0.5	0.1	0.646	30	327.421	20.418	19.772
Diospyros mespiliformis	D0.5	0.03	1.19	2	3336.6069	65.179	63.989
Parinari curatellifolia	D0.5	0.17	0.599	59	168.7988	14.66	14.062
Pavetta schumanniana	D1	0.07	0.74	15	645.126	28.66	27.92
Psydrax locuples	D1	0.03	1.19	2	3336.6069	65.179	63.989
Dalbergia melanoxylon	D1	0.1	0.646	30	327.421	20.418	19.772
Diospyros mespiliformis	D1	0.07	1.19	5	1668.3035	40.089	44.899
Euclea natalensis subsp. angustifolia	D1	0.03	1.19	2	3336.6069	65.179	63.989
Flueggea virosa subsp. virosa	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Flueggea virosa subsp. virosa	D1	0.03	1.19	2	3336.6069	65.179	63.989
Gymnosporia buxifolia	D1	0.2	0.74	46	215.042	16.547	15.807
Searsia pyroides var. pyroides	D1	0.07	1.19	5	1668.3035	40.089	44.899
Strychnos madagascariensis	D1	0.03	0.457	20	492.0888	25.031	24.574
Vachellia exuvialis	D1	0.07	0.599	23	421.9971	23.18	22.581
Vachellia exuvialis	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Antidesma venosum	D0.5	0.07	0.965	9	1097.0736	37.374	36.409
Combretum molle	D1	0.07	0.965	9	1097.0736	37.374	36.409
Dombeya rotundifolia var. rotundifolia	D1	0.07	1.19	5	1668.3035	40.089	44.899
Solanum panduriforme	D0.5	0.03	0.74	69	143.3614	13.51	12.77
Solanum panduriforme	D1	0.17	0.74	38	258.0504	18.126	17.386
Vangueria infausta	D1	0.03	1.19	2	3336.6069	65.179	63.989
Ziziphus mucronata	D0.5	0.07	1.19	5	1668.3035	40.089	44.899
Piliostigma thonningii	D1	0.03	0.74	7	1290.2521	40.531	39.791
Ehretia amoena	D0.5	0.07	0.74	15	645.126	28.66	27.92
Ziziphus mucronata	D1	0.03	1.19	2	3336.6069	65.179	63.989
Searsia gueinzii	D1	0.07	0.823	12	798.9292	31.894	31.071
Combretum collinum subsp. gazense	D1	0.07	1.19	5	1668.3035	40.089	44.899
Ochna pulchra	D0.5	0	0.282	5	1873.7402	48.844	48.652
Searsia gueinzii	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Searsia pyroides var. pyroides	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Pappea capensis	D1	0.03	1.19	2	3336.6069	65.179	63.989
Diospyros lycioides subsp. sericea	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Totals for growth form:		7,67	48,261	1606	77918,07	2108,64	2060,38

Shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	Ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Combretum collinum subsp. gazense	S2	0.03	1.93	1	8776.5879	105.71	103.78
Dichrostachys cinerea	S2	0.91	1.04	107	93.3502	10.902	9.862
Dichrostachys cinerea S	S1.5	0.74	1.19	66	150.2976	13.833	12.643
Euclea divinorum	S1.5	0.17	1.19	14	667.3214	29.149	27.959
Euclea divinorum	S2	0.3	1.683	13	741.8377	30.733	29.05
Piliostigma thonningii	S1.5	0.03	5.07	0	60565.742	277.695	272.625
Searsia gueinzii	S1.5	0.17	1.93	5	1755.3176	47.275	45.345
Searsia pyroides var. pyroides	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Terminalia sericea	S1.5	1.82	1.19	163	61.2221	8.829	7.639
Terminalia sericea	S2	6.79	1.19	610	16.3881	4.568	3.378
Psydrax locuples	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Cassia abbreviata subsp. beareana	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Dalbergia melanoxylon	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Diospyros mespiliformis	S1.5	0.07	1.19	5	1668.3035	46.089	44.899
Flueggea virosa subsp. virosa	S1.5	0.07	0.965	9	1097.0736	37.374	36.409
Gymnosporia buxifolia	S1.5	0.17	0.74	38	258.0504	18.126	17.386
Pavetta schumanniana	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Vachellia exuvialis	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Combretum molle	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Gymnosporia buxifolia	S2	0.27	1.19	23	417.0759	23.044	21.854
Philenoptera violacea	S2	0.07	0.965	9	1097.0736	37.374	36.409
Combretum collinum subsp. gazense	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Piliostigma thonningii	S2	0.03	1.93	1	8776.5879	105.71	103.78
Searsia gueinzii	S2	0.03	1.93	1	8776.5879	105.71	103.78
Grewia bicolor	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Sclerocarya birrea subsp. caffra	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Peltophorum africanum	S2	0.03	1.93	1	8776.5879	105.71	103.78
Antidesma venosum	S1.5	0.07	1.56	3	2867.0176	60.419	58.859
Strychnos madagascariensis	S1.5	0.07	0.599	23	421.9971	23.18	22.581
Ziziphus mucronata	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Euclea natalensis subsp. angustifolia	S2	0.03	1.19	2	3336.6069	65.179	63.989
Diospyros lycioides subsp. sericea	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Dombeya rotundifolia var. rotundifolia	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Pappea capensis	S2	0.03	1.93	1	8776.5879	105.71	103.78
Parinari curatellifolia	S2	0.03	1.19	2	3336.6069	65.179	63.989
Searsia pyroides var. pyroides	S2	0.03	5.07	0	60565.742	277.695	272.625
Totals for growth form:		12.39	54.842	1152	233163.13	2484.29	2429.45

Trees

Species	Height class code	Mean cover %	Mean can. Dia, (m)	Ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	T	1.45	2.73	24	404.6195	22.698	19.968
Gymnosporia buxifolia	T	0.2	1.437	12	810.5352	32.125	30.688
Sclerocarya birrea subsp. caffra	T	0.4	8.2	0	13202.542	129.653	121.453
Searsia pyroides var. pyroides	T	0.2	2.58	3	2613.9624	57.691	55.111
Terminalia sericea	T	8.13	4.423	52	189.016	15.513	11.09
Antidesma venosum	T	0.07	0.965	9	1097.0736	37.374	36.409
Euclea divinorum	T	0.3	1.437	18	540.3568	26.23	24.793
Peltophorum africanum	T	0.03	3.13	0	23083.402	171.437	168.307

Searsia gueinzii	T	0.07	2.53	1	7540.8823	97.986	95.456
Ximenia caffra	T	0.03	1.19	2	3336.6069	65.179	63.989
Piliostigma thonningii	T	0.03	8.2	0	158430.5	449.132	440.932
Euclea natalensis subsp. angustifolia	T	0.03	1.93	1	8776.5879	105.71	103.78
Combretum collinum subsp. gazense	T	1.21	3.13	15	635.9064	28.455	25.325
Albizia versicolor	T	0	1.19	0	33366.074	206.114	204.924
Totals for growth form:		12.16	43.072	144	254028.08	1445.3	1402.23
Totals for community:		32.21	146.175	2903	565109.25	6038.23	5892.05
Means for community:		0.3	1.379	27	194.6583	56.964	55.585

August Triennial Burn

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	Ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Antidesma venosum	D1	0.07	0.965	9	1097.0736	37.374	36,409
Cassia abbreviata subsp. beareana	D0.5	0.54	1.93	18	545.1297	26.345	24,415
Cassia abbreviata subsp. beareana	D1	0.57	0.965	77	128.3127	12.782	11,817
Catunaregam spinosa	D1	0.03	0.74	7	1290.2521	40.531	39,791
Dichrostachys cinerea	D0.5	1.38	0.74	320	31.241	6.307	5,567
Dichrostachys cinerea	D1	2.99	1.287	229	43.4861	7.441	6,154
Diospyros lycioides subsp. sericea	D1	0.03	0.74	7	1290.2521	40.531	39,791
Euclea divinorum	D1	0.03	1.19	2	3336.6069	65.179	63,989
Grewia bicolor	D0.5	0.57	1.56	29	335.3237	20.663	19,103
Grewia bicolor	D1	0.03	1.19	2	3336.6069	65.179	63,989
Grewia flavescens	D0.5	0.03	1.19	2	3336.6069	65.179	63,989
Gymnosporia buxifolia	D0.5	0.07	1.194	5	1678.1315	46.224	45,031
Annona senegalensis subsp. senegalensis	D1	0.03	1.93	1	8776.5879	105.71	103,78
Annona senegalensis subsp. Senegalensis	D0.5	0.03	1.19	2	3336.6069	65.179	63,989
Parinari curatellifolia	D1	0.13	1.93	4	2194.147	52.855	50,925
Pavetta schumanniana	D0.5	0.03	0.74	7	1290.2521	40.531	39,791
Philenoptera violacea	D0.5	0.03	0.74	7	1290.2521	40.531	39,791
Rhoicissus tridentata subsp. cuneifolia	D0.5	0.03	1.93	1	8776.5879	105.71	103,78
Sclerocarya birrea subsp. caffra	D1	0.07	0.965	9	1097.0736	37.374	36,409
Sclerocarya birrea subsp. caffra	D0.5	0.07	0.965	9	1097.0736	37.374	36,409
Solanum lichtensteinii	D0.5	0.03	0.74	7	1290.2521	40.531	39,791
Strychnos madagascariensis	D0.5	0.07	0.599	23	421.9971	23.18	22,581
Terminalia sericea	D0.5	1.28	0.701	330	30.2595	6.207	5,506
Terminalia sericea	D1	1.45	0.946	205	48.5509	7.862	6,917
Combretum molle	D0.5	0.03	1.19	2	3336.6069	65.179	63,989
Dalbergia melanoxylon	D0.5	0.03	0.74	7	1290.2521	40.531	39,791
Diospyros mespiliformis	D1	0.03	1.19	2	3336.6069	65.179	63,989
Euclea natalensis subsp. angustifolia	D1	0.3	1.19	27	366.6601	21.607	20,417
Flueggea virosa subsp. virosa	D0.5	0.03	1.19	2	3336.6069	65.179	63,989
Flueggea virosa subsp. virosa	D1	0.03	1.19	2	3336.6069	65.179	63,989
Gymnosporia buxifolia	D1	0.03	1.19	2	3336.6069	65.179	63,989
Antidesma venosum	D0.5	0.03	0.457	20	492.0888	25.031	24,574
Combretum molle	D1	0.03	0.74	7	1290.2521	40.531	39,791
Dombeya rotundifolia var. rotundifolia	D1	0.03	1.19	2	3336.6069	65.179	63,989
Solanum panduriforme	D0.5	0.03	0.457	20	492.0888	25.031	24,574
Solanum panduriforme	D1	0.03	0.457	20	492.0888	25.031	24,574

Ziziphus mucronata	D0.5	0.03	0.457	20	492.0888	25.031	24,574
Peltophorum africanum	D1	0.03	0.74	7	1290.2521	40.531	39,791
Philenoptera violacea	D1	0.13	0.74	31	322.563	20.266	19,526
Piliostigma thonningii	D1	0.07	1.56	3	2867.0176	60.419	58,859
Ehretia amoena	D0.5	0.03	1.19	2	3336.6069	65.179	63,989
Ehretia amoena	D1	0.03	0.74	7	1290.2521	40.531	39,791
Ziziphus mucronata	D1	0.03	0.74	7	1290.2521	40.531	39,791
Grewia flavescens	D1	0.03	1.19	2	3336.6069	65.179	63,989
Combretum collinum subsp. gazense	D1	0.03	0.74	7	1290.2521	40.531	39,791
Searsia pyroides var. pyroides	D0.5	0.03	1.93	1	8776.5879	105.71	103,78
Gymnosporia senegalensis	D0.5	0.03	0.74	7	1290.2521	40.531	39,791
Gymnosporia senegalensis	D1	0.03	0.74	7	1290.2521	40.531	39,791
Pappea capensis	D0.5	0.03	1.19	2	3336.6069	65.179	63,989
Searsia lancea	D1	0.03	1.19	2	3336.6069	65.179	63,989
Totals for growth form:		10.87	52.134	1563	104087.92	2280.95	2228.82

Shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	Ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Combretum collinum subsp. gazense	S2	0.03	1.93	1	8776.5879	105.71	103,78
Combretum zeyheri	S2	0.03	1.19	2	3336.6069	65.179	63,989
Dichrostachys cinerea	S2	2.59	1.437	159	62.6702	8.933	7,496
Dichrostachys cinerea	S1.5	2.59	1.437	159	62.6702	8.933	7,496
Euclea divinorum	S1.5	0.37	1.19	33	300.5952	19.563	18,373
Euclea divinorum	S2	0.03	1.93	1	8776.5879	105.71	103,78
Annona senegalensis subsp. senegalensis	S2	0.03	1.93	1	8776.5879	105.71	103,78
Parinari curatellifolia	S1.5	0.13	1.19	11	834.1517	32.589	31,399
Piliostigma thonningii	S1.5	0.03	1.93	1	8776.5879	105.71	103,78
Rhoicissus tridentata subsp. cuneifolia	S1.5	0.03	1.93	1	8776.5879	105.71	103,78
Albizia versicolor	S1.5	0.03	1.93	1	8776.5879	105.71	103,78
Albizia versicolor	S2	0.03	1.93	1	8776.5879	105.71	103,78
Searsia gueinzii	S1.5	0.07	1.19	5	1668.3035	46.089	44,899
Searsia pyroides var. pyroides	S1.5	0.07	1.19	5	1668.3035	46.089	44,899
Terminalia sericea	S1.5	2.89	1.683	129	77.0074	9.902	8,219
Terminalia sericea	S2	0.84	1.19	75	132.4051	12.984	11,794
Euclea natalensis subsp. angustifolia	S1.5	1.21	1.19	108	91.9175	10.818	9,628
Gymnosporia buxifolia	S1.5	0.03	1.93	1	8776.5879	105.71	103,78
Vachellia exuvialis	S1.5	0	0.74	0	12902.523	128.172	127,432
Combretum collinum subsp. gazense	S1.5	0.07	1.56	3	2867.0176	60.419	58,859
Piliostigma thonningii	S2	0.03	1.93	1	8776.5879	105.71	103,78
Searsia gueinzii	S2	0.07	2.53	1	7540.8823	97.986	95,456
Philenoptera violacea	S1.5	0	1.19	0	33366.074	206.114	204,924
Sclerocarya birrea subsp. caffra	S1.5	0.03	1.19	2	3336.6069	65.179	63,989
Peltophorum africanum	S2	0.03	3.13	0	23083.402	171.437	168,307
Antidesma venosum	S1.5	0.03	1.19	2	3336.6069	65.179	63,989
Vachellia gerrardii	S1.5	0	0.457	2	4920.8887	79.155	78,698
Combretum molle	S2	0.03	1.19	2	3336.6069	65.179	63,989
Gymnosporia senegalensis	S2	0.03	1.93	1	8776.5879	105.71	103,78
Pappea capensis	S1.5	0.03	1.19	2	3336.6069	65.179	63,989
Ximenia caffra	S1.5	0.03	1.19	2	3336.6069	65.179	63,989
Totals for growth form:		11.46	47.744	728	197364.34	2387.36	2339.62

Trees

Species	Height class code	Mean cover %	Mean can. Dia, (m)	Ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	T	2.42	1.683	108	92.0902	10.828	9.145
Diospyros lycioides subsp. sericea	T	0.03	1.19	2	3336.6069	65.179	63.989
Diospyros mespiliformis	T	0.07	3.5	0	14431.69	135.554	132.054
Gymnosporia buxifolia	T	0.07	2.53	1	7540.8823	97.986	95.456
Sclerocarya birrea subsp. caffra	T	0.97	5.665	3	2589.5725	57.421	51.756
Searsia pyroides var. pyroides	T	0.07	4.1	0	19803.813	158.792	154.692
Strychnos madagascariensis	T	0.03	0.74	7	1290.2521	40.531	39.791
Terminalia sericea	T	4.87	3.777	43	229.8693	17.108	13.331
Antidesma venosum	T	0.07	2.16	1	5496.5303	83.656	81.496
Euclea divinorum	T	0.3	5.07	1	6655.5762	92.055	86.985
Philenoptera violacea	T	0.13	3.13	1	5770.8506	85.719	82.589
Piliostigma thonningii	T	0.03	1.93	1	8776.5879	105.71	103.78
Euclea natalensis subsp. angustifolia	T	0.3	1.93	10	964.4603	35.043	33.113
Combretum collinum subsp. gazense	T	0.03	1.93	1	8776.5879	105.71	103.78
Ehretia amoena	T	0.03	1.19	2	3336.6069	65.179	63.989
Grewia bicolor	T	0.54	1.93	18	545.1297	26.345	24.415
Gymnosporia senegalensis	T	0.03	3.13	0	23083.402	171.437	168.307
Totals for growth form:		10.01	45.585	208	112720.52	1354.26	1308.67
Totals for community:		32.34	145.462	2500	414172.75	6022.57	5877.11
Means for community:		0.33	1.484	26	165.6479	61.455	59.97

August Annual Burn

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	Ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Cassia abbreviata subsp. beareana	D0.5	0.44	0.74	101	98.4925	11.198	10.458
Cassia abbreviata subsp. beareana	D1	0.44	0.965	59	167.4921	14.603	13.638
Catunaregam spinosa	D1	0.03	0.74	7	1290.2521	40.531	39.791
Dichrostachys cinerea	D0.5	2.59	0.796	520	19.2226	4.947	4.152
Dichrostachys cinerea	D1	2.59	1.04	304	32.841	6.466	5.426
Euclea divinorum	D1	0.07	0.965	9	1097.0736	37.374	36.409
Grewia bicolor	D0.5	0.03	1.19	2	3336.6069	65.179	63.989
Gymnosporia buxifolia	D0.5	0.1	0.646	30	327.421	20.418	19.772
Annona senegalensis subsp. senegalensis	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Annona senegalensis subsp. senegalensis	D1	0.03	0.74	7	1290.2521	40.531	39.791
Pavetta schumanniana	D0.5	0.17	0.599	59	168.7988	14.66	14.062
Philenoptera violacea	D0.5	0.07	0.599	23	421.9971	23.18	22.581
Rhoicissus tridentata subsp. cuneifolia	D0.5	0.03	1.93	1	8776.5879	105.71	103.78
Sclerocarya birrea subsp. caffra	D1	0.07	1.19	5	1668.3035	46.089	44.899
Sclerocarya birrea subsp. caffra	D0.5	0.1	1.04	11	849.4868	32.888	31.848
Solanum lichtensteinii	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Strychnos madagascariensis	D0.5	0.1	0.74	23	430.084	23.401	22.661
Terminalia sericea	D0.5	1.68	1.04	197	50.5647	8.024	6.984
Terminalia sericea	D1	1.51	1.19	135	73.6558	9.684	8.494
Catunaregam spinosa	D0.5	0.07	0.599	23	421.9971	23.18	22.581

Combretum collinum subsp. gazense	D0.5	0.54	1.19	48	207.2427	16.244	15.054
Combretum hereroense	D1	0.04	0.965	5	1994.6794	50.395	49.43
Combretum molle	D0.5	0.07	0.823	12	798.9292	31.894	31.071
Dalbergia melanoxylon	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Diospyros mespiliformis	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Euclea divinorum	D0.5	0.07	0.599	23	421.9971	23.18	22.581
Parinari curatellifolia	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Pavetta schumanniana	D1	0.17	1.56	8	1146.807	38.212	36.652
Albizia versicolor	D1	0.03	1.93	1	8776.5879	105.71	103.78
Diospyros mespiliformis	D1	0.03	1.19	2	3336.6069	65.179	63.989
Gymnosporia buxifolia	D1	0.07	0.74	15	645.126	28.66	27.92
Strychnos madagascariensis	D1	0.03	0.457	20	492.0888	25.031	24.574
Combretum molle	D1	0.03	1.19	2	3336.6069	65.179	63.989
Dombeya rotundifolia var. rotundifolia	D1	0.03	0.74	7	1290.2521	40.531	39.791
Solanum panduriforme	D0.5	0.17	0.74	38	258.0504	18.126	17.386
Solanum panduriforme	D1	0.13	0.74	31	322.563	20.266	19.526
Ziziphus mucronata	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Philenoptera violacea	D1	0.03	0.74	7	1290.2521	40.531	39.791
Ehretia amoena	D0.5	0.07	0.74	15	645.126	28.66	27.92
Ehretia amoena	D1	0.07	0.74	15	645.126	28.66	27.92
Ziziphus mucronata	D1	0.03	1.19	2	3336.6069	65.179	63.989
Lantana camara	D1	0.03	0.457	20	492.0888	25.031	24.574
Searsia gueinzii	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Ximenia caffra	D1	0.03	0.74	7	1290.2521	40.531	39.791
Ximenia caffra	D0.5	0.03	1.19	2	3336.6069	65.179	63.989
Totals for growth form:		12.04	40.588	1872	63616.492	1634.17	1593.58

Shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	Ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Combretum collinum subsp. gazense	S2	0.03	1.93	1	8776.5879	105.71	103.78
Dichrostachys cinerea	S2	2.35	1.19	211	47.2607	7.757	6.567
Dichrostachys cinerea	S1.5	2.05	1.437	126	79.0766	10.034	8.597
Euclea divinorum	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Rhoicissus tridentata subsp. cuneifolia	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Albizia versicolor	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Searsia gueinzii	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Terminalia sericea	S1.5	3.29	1.437	203	49.2228	7.917	6.48
Terminalia sericea	S2	3.29	1.437	203	49.2228	7.917	6.48
Combretum hereroense	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Diospyros mespiliformis	S2	0.03	1.19	2	3336.6069	65.179	63.989
Cassia abbreviata subsp. beareana	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Catunaregam spinosa	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Dalbergia melanoxylon	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Gymnosporia buxifolia	S1.5	0.07	0.965	9	1097.0736	37.374	36.409
Pavetta schumanniana	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Sclerocarya birrea subsp. caffra	S2	0.03	1.19	2	3336.6069	65.179	63.989
Combretum molle	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Cassia abbreviata subsp. beareana	S2	0.03	1.93	1	8776.5879	105.71	103.78
Grewia bicolor	S1.5	0.07	1.93	2	4388.2939	74.749	72.819
Philenoptera violacea	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Sclerocarya birrea subsp. caffra	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Ximenia caffra	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Ximenia caffra	S2	0.03	1.19	2	3336.6069	65.179	63.989

Totals for growth form:		11,72	33,065	805	90922,625	1496,98	1463,91

Trees

Species	Height class code	Mean cover %	Mean can. Dia, (m)	Ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	T	2.89	1.437	178	56.0924	8.451	7.014
Sclerocarya birrea subsp. caffra	T	0.57	5.065	2	3534.8738	67.088	62.023
Searsia pyroides var. pyroides	T	0.03	3.13	0	23083.402	171.437	168.307
Terminalia sericea	T	4.2	3.377	46	213.2146	16.476	13.1
Antidesma venosum	T	0.03	1.93	1	8776.5879	105.71	103.78
Combretum hereroense	T	0.03	1.93	1	8776.5879	105.71	103.78
Ximenia caffra	T	0.03	3.13	0	23083.402	171.437	167.307
Totals for growth form:		7.79	19.998	231	67524.156	646.31	626.312
Totals for community:		31.56	93.651	2908	222063.28	3777.45	3683.8
Means for community:		0.42	1.232	38	76.35	49.703	48.471

ANNEXURE B: Species cover relationships for the Skukuza Experimental Burn Plot

No Burn treatment

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	D0.5	0.2	0.457	121	82.0148	10.219	9.762
Dichrostachys cinerea	D1	0.13	0.457	81	123.0222	12.515	12.058
Euclea divinorum	D1	0.13	0.457	81	123.0222	12.515	12.058
Grewia bicolor	D1	0.07	0.965	9	1097.0736	37.374	36.409
Grewia flavescens	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Pavetta schumanniana	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Sclerocarya birrea subsp. caffra	D1	0.07	0.823	12	798.9292	31.894	31.071
Sclerocarya birrea subsp. caffra	D0.5	0.13	0.74	31	322.563	20.266	19.526
Solanum lichtensteinii	D0.5	0.13	1.19	11	834.1517	32.589	31.399
Strychnos madagascariensis	D0.5	0.13	0.457	81	123.0222	12.515	12.058
Terminalia sericea	D0.5	0.07	0.823	12	798.9292	31.894	31.071
Terminalia sericea	D1	0.47	0.74	109	91.5072	10.794	10.054
Combretum collinum subsp. gazense	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Combretum hereroense	D1	0.07	1.335	4	2099.6343	51.704	50.369
Dalbergia melanoxylon	D0.5	0.07	0.74	15	645.126	28.66	27.92
Dalbergia melanoxylon	D1	0.34	0.457	205	48.7217	7.876	7.419
Flueggea virosa subsp. virosa	D1	0.03	1.19	2	3336.6069	65.179	63.989
Gymnosporia buxifolia	D1	0.03	0.457	20	492.0888	25.031	24.574
Strychnos madagascariensis	D1	0.13	0.457	81	123.0222	12.515	12.058
Vachellia exuvialis	D1	0.17	0.74	38	258.0504	18.126	17.386
Vachellia exuvialis	D0.5	0.2	0.551	83	119.3681	12.328	11.777
Solanum panduriforme	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Ziziphus mucronata	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Ehretia amoena	D1	0.03	0.457	20	492.0888	25.031	24.574
Grewia flavescens	D1	0.03	1.19	2	3336.6069	65.179	63.989
Combretum collinum subsp. gazense	D1	0.03	0.457	20	492.0888	25.031	24.574
Diospyros lycioides subsp. sericea	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Senegalia nigrescens	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Albizia harveyi	D1	0.07	0.965	9	1097.0736	37.374	36.409
Combretum apiculatum subsp. apiculatum	D1	0.2	0.74	46	215.042	16.547	15.807
Vachellia gerrardii	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Cissus cornifolia	D1	0.07	0.823	12	798.9292	31.894	31.071
Ormocarpum trichocarpum	D0.5	0.07	0.457	40	246.0444	17.7	17.243
Ormocarpum trichocarpum	D1	0.07	0.457	40	246.0444	17.7	17.243
Capparis tomentosa	D1	0.03	1.19	2	3336.6069	65.179	63.989
Combretum hereroense	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Commiphora edulis subsp. edulis	D1	0.07	0.599	23	421.9971	23.18	22.581
Ehretia rigida subsp. nervifolia	D1	0.03	0.457	20	492.0888	25.031	24.574
Cissus cornifolia	D0.5	0.07	0.599	23	421.9971	23.18	22.581
Combretum zeyheri	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Aspargus setaceus	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Solanum lichtensteinii	D1	0.03	0.74	7	1290.2521	40.531	39.791
Pterocarpus rotunidifolius subsp. rotunidifolius	D1	0.03	1.19	2	3336.6069	65.179	63.989
Senegalia nigrescens	D1	0.03	1.19	2	3336.6069	65.179	63.989
Combretum zeyheri	D1	0.03	0.457	20	492.0888	25.031	24.574

Totals for growth form:		3.87	32.192	1462	42047.27	1365.548	1333.357

Shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Combretum zeyheri	S2	0.07	2.16	1	5496.5303	83.656	81.496
Dichrostachys cinerea	S2	0.13	0.457	81	123.0222	12.515	12.058
Dichrostachys cinerea	S1.5	0.13	0.457	81	123.0222	12.515	12.058
Euclea divinorum	S2	1.21	1.93	41	241.7793	17.545	15.615
Terminalia sericea	S2	0.54	1.19	48	207.2427	16.244	15.054
Combretum hereroense	S1.5	0.3	1.19	27	366.6601	21.607	20.417
Dalbergia melanoxylon	S1.5	0.07	0.965	9	1097.0736	37.374	36.409
Flueggea virosa subsp. virosa	S1.5	0.07	0.457	40	246.0444	17.7	17.243
Vachellia exuvialis	S1.5	0.44	0.74	101	98.4925	11.198	10.458
Searsia gueinzii	S2	0.03	3.13	0	23083.402	171.437	168.307
Sclerocarya birrea subsp. caffra	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Dalbergia melanoxylon	S2	0.03	1.19	2	3336.6069	65.179	63.989
Grewia flavescens	S1.5	0.07	2.333	8	115.6909	38.36	36.026
Albizia harveyi	S2	0.03	1.19	2	3336.6069	65.179	63.989
Cissus cornifolia	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Combretum zeyheri	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Vachellia exuvialis	S2	0.13	0.74	31	322.563	20.266	19.526
Vachellia gerrardii	S2	0.13	1.93	4	2194.147	52.855	50.925
Combretum apiculatum subsp. apiculatum	S1.5	0.84	0.74	195	51.2005	8.074	7.334
Senegalia nigrescens	S2	0.17	1.56	8	1146.807	38.212	36.652
Ormocarpum trichocarpum	S1.5	0.03	0.457	20	492.0888	25.031	24.574
Ormocarpum trichocarpum	S2	0.03	0.457	20	492.0888	25.031	24.574
Combretum apiculatum subsp. apiculatum	S2	1.38	0.965	188	53.1271	8.225	7.26
Pterocarpus rotunidifolius subsp. rotunidifolius	S2	0.13	1.93	4	2194.147	52.855	50.925
Pterocarpus rotunidifolius subsp. rotunidifolius	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Gardenia volkensii subsp. volkensii	S1.5	0.03	0.457	20	492.0888	25.031	24.574
Totals for growth form:		6.44	33.155	952	73970.453	1183.753	1150.598

Trees

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	T	0.07	1.19	5	1668.3035	46.089	44.899
Gymnosporia buxifolia	T	0.03	0.74	7	1290.2521	40.531	39.791
Sclerocarya birrea subsp. caffra	T	0.07	2.16	1	5496.5303	83.656	81.496
Terminalia sericea	T	1.07	3.13	13	716.8759	30.212	27.082
Combretum hereroense	T	0.03	3.13	3	2536.6377	56.831	53.701
Albizia harveyi	T	0.03	1.93	1	8776.5879	105.71	103.78
Euclea divinorum	T	2.15	3.13	27	357.8822	21.346	18.216
Peltophorum africanum	T	0.03	3.13	0	23083.402	171.437	168.307
Philenoptera violacea	T	0.03	3.13	0	23083.402	171.437	168.307
Dalbergia melanoxylon	T	0.54	3.13	6	1433.7517	42.726	39.596
Euclea natalensis subsp. angustifolia	T	0.03	1.93	1	8776.5879	105.71	103.78
Combretum collinum subsp. gazense	T	0.67	3.13	8	1148.428	38.239	35.109
Pappea capensis	T	0.03	1.19	2	3336.6069	65.179	63.989

Vachellia exuvialis	T	0.13	0.74	31	322.563	20.266	19.526
Combretum apiculatum subsp. apiculatum	T	1.38	3.13	17	558.9202	26.677	23.547
Combretum zeyheri	T	0.03	3.13	0	23083.402	171.437	168.307
Vachellia gerrardii	T	0.07	2.53	1	7540.8823	97.986	95.456
Senegalia nigrescens	T	0.03	3.13	0	23083.402	171.437	168.307
Capparis tomentosa	T	0.03	1.93	1	8776.5879	105.71	103.78
Grewia flavescens	T	0.17	2.53	3	3016.353	61.972	59.442
Lannea schweinfurthii	T	0.03	3.13	0	23083.402	171.437	168.307
Manilkara mochisia	T	0.03	5.07	0	60565.742	277.695	272.625
Ziziphus mucronata	T	0.07	2.53	1	7540.8823	97.986	95.456
Pterocarpus rotunidifolius subsp. rotunidifolius	T	0.13	1.93	4	2194.147	52.855	50.925
Ozoroa sphaerocarpa	T	0.03	3.13	0	23083.402	171.437	168.307
Totals for growth form:		7.21	63.96	145	264554.94	2406.002	2342.042
Totals for community:		17.52	129.307	2560	380572.66	4955.303	4825.966
Means for community:		0.18	1.347	27	148.6338	51.618	50.271

February Triennial Burn

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Catunaregam spinosa	D1	0.03	0.74	7	1290.2521	40.531	39.791
Dichrostachys cinerea	D0.5	0.13	0.74	31	322.563	20.266	19.526
Dichrostachys cinerea	D1	0.4	0.89	64	155.5285	14.072	13.182
Grewia flavescens	D0.5	0.27	1.56	13	716.7544	30.209	28.649
Gymnosporia buxifolia	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Sclerocarya birrea subsp. caffra	D1	0.17	0.74	38	258.0504	18.126	17.386
Sclerocarya birrea subsp. caffra	D0.5	0.2	0.551	83	119.3681	12.328	11.777
Solanum lichtensteinii	D0.5	0.01	0.551	41	238.7362	17.435	16.883
Strychnos madagascariensis	D0.5	0.07	0.457	40	246.0444	17.7	17.243
Terminalia sericea	D0.5	0.54	0.74	124	80.1399	10.101	9.361
Terminalia sericea	D1	0.7	0.89	113	88.4522	10.612	9.722
Combretum collinum subsp. gazense	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Dalbergia melanoxylon	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Pavetta schumanniana	D1	0.03	0.74	7	1290.2521	40.531	39.791
Dalbergia melanoxylon	D1	0.03	0.74	7	1290.2521	40.531	39.791
Flueggea virosa subsp. virosa	D1	0.07	0.74	15	645.126	28.66	27.92
Gymnosporia buxifolia	D1	0.03	0.457	20	492.0888	25.031	24.574
Strychnos madagascariensis	D1	0.03	0.457	20	492.0888	25.031	24.574
Vachellia exuvialis	D1	0.17	0.599	59	168.7988	14.66	14.062
Vachellia exuvialis	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Philenoptera violacea	D1	0.03	0.74	7	1290.2521	40.531	39.791
Ehretia amoena	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Ehretia amoena	D1	0.03	1.19	2	3336.6069	65.179	63.989
Ziziphus mucronata	D1	0.03	1.19	2	3336.6069	65.179	63.989
Grewia flavescens	D1	0.03	1.19	2	3336.6069	65.179	63.989
Combretum collinum subsp. gazense	D1	0.13	0.74	31	322.563	20.266	19.526
Pappea capensis	D1	0.03	1.19	2	3336.6069	65.179	63.989
Senegalia nigrescens	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Combretum apiculatum subsp. apiculatum	D0.5	0.27	0.965	36	274.2684	18.687	17.722
Cissus cornifolia	D1	0.1	1.533	5	1846.5582	48.488	46.955

Combretum apiculatum subsp. apiculatum	D1	0.17	0.74	38	258.0504	18.126	17.386
Ormocarpum trichocarpum	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Ormocarpum trichocarpum	D1	0.03	0.74	7	1290.2521	40.531	39.791
Commiphora edulis subsp. edulis	D1	0.07	0.74	15	645.126	28.66	27.92
Cissus cornifolia	D0.5	0.07	0.599	23	421.9971	23.18	22.581
Commiphora edulis subsp. Edulis	D0.5	0.07	0.599	23	421.9971	23.18	22.581
Lannea discolor	D1	0.03	0.457	20	492.0888	25.031	24.574
Lannea schweinfurthii	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Lannea schweinfurthii	D1	0.03	0.457	20	492.0888	25.031	24.574
Vachellia gerrardii	D1	0.03	0.74	7	1290.2521	40.531	39.791
Rhoicissus tridentata subsp. cuneifolia	D1	0.03	1.19	2	3336.6069	65.179	63.989
Solanum lichtensteinii	D1	0.03	0.74	7	1290.2521	40.531	39.791
Ochna natalitia	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Totals for growth form:		4.54	33.6	1079	44623.152	1427.808	1394.209

Shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Combretum collinum subsp. gazense	S2	0.13	1.19	11	834.1517	32.589	31.399
Combretum zeyheri	S2	0.13	1.93	4	2194.147	52.855	50.925
Dichrostachys cinerea	S2	0.67	0.74	155	64.1917	9.041	8.301
Dichrostachys cinerea	S1.5	0.8	1.287	61	161.855	14.355	13.069
Euclea divinorum	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Terminalia sericea	S1.5	0.6	1.137	59	168.1895	14.634	13.497
Catunaregam spinosa	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Dalbergia melanoxylon	S1.5	0.03	0.457	20	492.0888	25.031	24.574
Gymnosporia buxifolia	S1.5	0.03	0.457	20	492.0888	25.031	24.574
Mundulea sericea subsp. sericea	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Mundulea sericea subsp. sericea	S2	0.03	0.74	7	1290.2521	40.531	39.791
Sclerocarya birrea subsp. caffra	S2	0.03	0.74	7	1290.2521	40.531	39.791
Vachellia exuvialis	S1.5	0.13	0.74	31	322.563	20.266	19.526
Combretum molle	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Gymnosporia buxifolia	S2	0.03	1.19	2	3336.6069	65.179	63.989
Combretum collinum subsp. Gazense	S1.5	0.2	0.89	32	311.057	19.901	19.011
Searsia gueinzii	S2	0.03	1.93	1	8776.5879	105.71	103.78
Grewia bicolor	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Sclerocarya birrea subsp. Caffra	S1.5	0	1.19	0	33366.074	206.114	204.924
Grewia flavescens	S1.5	0.13	1.93	4	2194.147	52.855	50.925
Ziziphus mucronata	S2	0.03	1.19	2	3336.6069	65.179	63.989
Strychnos madagascariensis	S1.5	0.07	1.335	4	2099.6343	51.704	50.369
Ziziphus mucronata	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Ximenia caffra	S2	0.3	1.19	27	366.6601	21.607	20.417
Euclea natalensis subsp. angustifolia	S2	0.03	1.93	1	8776.5879	105.71	103.78
Albizia harveyi	S2	0.03	1.93	1	8776.5879	105.71	103.78
Cissus cornifolia	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Vachellia exuvialis	S2	0.03	1.19	2	3336.6069	65.179	63.989
Combretum apiculatum subsp. apiculatum	S2	0.27	1.56	13	716.7544	30.209	28.649
Combretum apiculatum subsp. apiculatum	S1.5	0.27	0.74	62	161.2815	14.33	13.59
Lannea schweinfurthii	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Pterocarpus rotunidifolius subsp. rotunidifolius	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Pterocarpus rotunidifolius subsp. rotunidifolius	S2	0.03	0.74	7	1290.2521	40.531	39.791
Flueggea virosa subsp. virosa	S2	0.03	0.74	7	1290.2521	40.531	39.791
Ochna natalitia	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Ozoroa sphaerocarpa	S1.5	0.03	1.19	2	3336.6069	65.179	63.989

Spirostachys africana	S2	0.3	0.74	70	141.7859	13.436	12.696
Commiphora edulis subsp. edulis	S1.5	0.03	0.457	20	492.0888	25.031	24.574
Jasminum fluminense	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Totals for growth form:		4.85	44.249	695	128813.17	2068.404	2024.155

Trees

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	T	0.97	1.683	43	228.6486	17.062	15.379
Diospyros lycioides subsp. Sericea	T	0.03	1.93	1	8776.5879	105.71	103.78
Gymnosporia buxifolia	T	0.13	1.93	4	2194.147	52.855	50.925
Sclerocarya birrea subsp. caffra	T	0.34	6.635	0	10270.028	114.351	107.716
Strychnos madagascariensis	T	0.03	0.74	7	1290.2521	40.531	39.791
Terminalia sericea	T	3.12	3.13	40	246.3544	17.711	14.581
Combretum hereroense	T	0.03	3.13	0	23083.402	171.437	168.307
Euclea divinorum	T	0.03	1.93	1	8776.5879	105.71	103.78
Peltophorum africanum	T	0.54	1.93	18	545.1297	26.345	24.415
Philenoptera violacea	T	0.03	5.07	0	60565.742	277.695	272.625
Boscia albitrunca	T	0.03	1.93	1	8776.5879	105.71	103.78
Combretum collinum subsp. Gazense	T	0.6	1.683	27	368.8695	21.672	19.988
Ehretia amoena	T	0.03	1.93	1	8776.5879	105.71	103.78
Spirostachys africana	T	0.54	1.93	18	545.1297	26.345	24.415
Vachellia exuvialis	T	0.03	1.19	2	3336.6069	65.179	63.989
Combretum apiculatum subsp. apiculatum	T	2.22	2.33	51	192.354	15.65	13.32
Combretum zeyheri	T	0.2	3.377	2	4477.5068	75.505	72.128
Senegalia nigrescens	T	0.03	1.93	1	8776.5879	105.71	103.78
Flueggea virosa subsp. virosa	T	0.03	1.93	1	8776.5879	105.71	103.78
Lannea schweinfurthii	T	0.03	1.93	1	8776.5879	105.71	103.78
Ziziphus mucronata	T	0.03	1.93	1	8776.5879	105.71	103.78
Cissus cornifolia	T	0.17	1.93	5	1755.3176	47.275	45.345
Pterocarpus rotunidifolius subsp. rotunidifolius	T	0.07	1.19	5	1668.3035	46.089	44.899
Ekebergia capensis	T	0.03	1.93	1	8776.5879	105.71	103.78
Pavetta schumanniana	T	0.03	1.93	1	8776.5879	105.71	103.78
Totals for growth form:		9.36	57.178	242	198533.69	2072.807	2015.629
Totals for community:		18.75	135.027	2017	371970	5569.02	5433.993
Means for community:		0.17	1.25	19	184.3472	51.565	50.315

August Triennial Burn

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	D0.5	0.1	0.796	20	497.2242	25.161	24.366
Philenoptera violacea	D1	0	0.457	2	4920.8887	79.155	87.698
Sclerocarya birrea subsp. caffra	D0.5	0.04	0.823	6	1452.5986	43.006	42.182
Sclerocarya birrea subsp. caffra	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Solanum lichtensteinii	D0.5	0.07	0.965	9	1097.0736	37.374	36.409

Strychnos madagascariensis	D0.5	0.44	0.823	81	121.9739	12.462	11.639
Terminalia sericea	D0.5	0.14	0.823	25	389.7216	22.276	21.452
Terminalia sericea	D1	0.14	0.965	18	535.1578	26.103	25.138
Catunaregam spinosa	D0.5	0.03	1.19	2	3336.6069	65.179	63.989
Dalbergia melanoxylon	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Dalbergia melanoxylon	D1	0.03	0.74	7	1290.2521	40.531	39.791
Strychnos madagascariensis	D1	0.44	0.823	81	121.9739	12.462	11.639
Vachellia exuvialis	D1	0.03	0.74	7	1290.2521	40.531	39.791
Vachellia exuvialis	D0.5	0.17	0.599	59	168.7988	14.66	14.062
Combretum collinum subsp. gazense	D1	0.07	1.56	3	2867.0176	60.419	58.859
Senegalia nigrescens	D0.5	0	0.457	2	4920.8887	79.155	78.698
Albizia harveyi	D1	0	0.74	0	12902.523	128.172	127.432
Combretum apiculatum subsp. apiculatum	D0.5	0.04	1.335	2	3817.5173	69.718	68.383
Cissus cornifolia	D1	0.03	1.93	1	8776.5879	105.71	103.78
Combretum apiculatum subsp. apiculatum	D1	0.03	0.457	20	492.0888	25.031	24.574
Ormocarpum trichocarpum	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Combretum hereroense	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Cissus cornifolia	D0.5	0.03	1.93	1	8776.5879	105.71	103.78
Gardenia volkensii subsp. volkensii	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Combretum zeyheri	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Pterocarpus rotunidifolius subsp. rotunidifolius	D1	0.03	1.93	1	8776.5879	105.71	103.78
Totals for growth form:		2.06	23.675	441	71899.352	1295.214	1271.539

Shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Combretum collinum subsp. gazense	S2	0.17	1.56	8	1146.807	38.212	36.652
Combretum zeyheri	S2	0.03	0.74	7	1290.2521	40.531	39.791
Dichrostachys cinerea	S2	0	1.19	0	33366.074	206.114	204.924
Dichrostachys cinerea	S1.5	0.04	1.93	1	7972.7173	100.791	98.861
Catunaregam spinosa	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Dalbergia melanoxylon	S1.5	0.07	0.965	9	1097.0736	37.374	36.409
Vachellia exuvialis	S1.5	0	1.19	0	33366.074	206.114	204.924
Gymnosporia buxifolia	S2	0.03	0.457	20	492.0888	25.031	24.574
Philenoptera violacea	S2	0	1.19	0	33366.074	206.114	204.924
Combretum collinum subsp. gazense	S1.5	0.17	1.56	8	1146.807	38.212	36.652
Philenoptera violacea	S1.5	0	1.19	0	33366.074	206.114	204.924
Sclerocarya birrea subsp. caffra	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Catunaregam spinosa	S2	0.13	1.93	4	2194.147	52.855	50.925
Dalbergia melanoxylon	S2	0.03	1.93	1	8776.5879	105.71	103.78
Strychnos madagascariensis	S2	0.72	0.74	62	161.2815	14.33	13.59
Strychnos madagascariensis	S1.5	0.44	0.599	155	64.427	9.057	8.459
Ximenia caffra	S1.5	0	0.457	2	4920.8887	79.155	78.698
Albizia harveyi	S2	0	0.457	2	4920.8887	79.155	78.698
Albizia harveyi	S1.5	0.3	0.74	70	141.7859	13.436	12.696
Cissus cornifolia	S1.5	0.04	1.93	1	7978.7173	100.791	98.861
Combretum zeyheri	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Lannea discolor	S1.5	0.17	1.56	8	1146.807	38.212	36.652
Vachellia exuvialis	S2	0.03	0.74	7	1290.2521	40.531	39.791
Combretum apiculatum subsp. apiculatum	S2	0.27	0.965	36	274.2684	18.687	17.722
Combretum apiculatum subsp. apiculatum	S1.5	0.67	0.965	91	109.1616	11.789	10.824
Protorhus longifolia	S2	0.03	1.19	2	3336.6069	65.179	63.989
Pterocarpus rotunidifolius subsp. rotunidifolius	S1.5	0	1.19	0	33366.074	206.114	204.924
Pterocarpus rotunidifolius subsp. rotunidifolius	S2	0.03	1.93	1	8776.5879	105.71	103.78

Cissus cornifolia	S2	0.03	1.93	1	8776.5879	105.71	103.78
Totals for growth form:		3.01	36.507	514	266586.72	2363.305	2326.799

Trees

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	T	0.17	1.56	8	1146.807	38.212	36.652
Sclerocarya birrea subsp. caffra	T	0.03	1.93	1	8776.5879	105.71	103.78
Strychnos madagascariensis	T	0.13	1.19	11	834.1517	32.589	31.399
Terminalia sericea	T	1.51	2.53	30	332.1975	20.566	18.036
Philenoptera violacea	T	0	1.93	0	87765.891	334.286	332.356
Combretum collinum subsp. gazense	T	0.17	2.53	3	3016.353	61.972	59.442
Vachellia exuvialis	T	0.04	1.56	1	5212.7598	81.468	79.908
Combretum apiculatum subsp. apiculatum	T	1.28	3.377	14	701.4371	29.885	26.508
Combretum zeyheri	T	0.34	2.53	6	1493.244	43.603	41.073
Cissus cornifolia	T	0.03	1.93	1	8776.5879	105.71	103.78
Pterocarpus rotunidifolius subsp. rotunidifolius	T	0.03	3.13	0	23083.402	171.437	168.307
Totals for growth form:		3.73	24.197	79	141139.41	1025.44	1001.244
Totals for community:		8.8	84.379	1035	479625.47	4683.959	4599.581
Means for community:		0.13	1.278	16	463.0734	70.969	69.691

August Annual Burn

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Catunaregam spinosa	D1	0.03	1.19	2	3336.6069	65.179	63.989
Dichrostachys cinerea	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Dichrostachys cinerea	D1	0.03	1.19	2	3336.6069	65.179	63.989
Grewia bicolor	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Grewia bicolor	D1	0.07	0.823	12	798.9292	31.894	31.071
Gymnosporia buxifolia	D0.5	0.03	1.19	2	3336.6069	65.179	63.989
Pavetta schumanniana	D0.5	0.07	0.965	9	1097.0736	37.374	36.409
Sclerocarya birrea subsp. caffra	D1	0.17	0.965	22	438.8294	23.638	22.673
Sclerocarya birrea subsp. caffra	D0.5	0.07	0.457	40	246.0444	17.7	17.243
Strychnos madagascariensis	D0.5	0.17	0.599	59	168.7988	14.66	14.062
Terminalia sericea	D1	0.44	0.965	59	167.4921	14.603	13.638
Catunaregam spinosa	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Combretum collinum subsp. gazense	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Dalbergia melanoxylon	D0.5	0.07	0.599	23	421.9971	23.18	22.581
Dalbergia melanoxylon	D1	0.03	1.19	2	3336.6069	65.179	63.989
Gymnosporia buxifolia	D1	0.03	0.74	7	1290.2521	40.531	39.791
Strychnos madagascariensis	D1	0.54	0.74	124	80.1399	10.101	9.361
Vachellia exuvialis	D1	0.17	1.335	11	839.8538	32.701	31.366
Vachellia exuvialis	D0.5	0.17	0.965	22	438.8294	23.638	22.673
Philenoptera violacea	D1	0.03	1.93	1	8776.5879	105.71	103.78

Ehretia amoena	D0.5	0.07	1.19	5	1668.3035	46.089	44.899
Searsia gueinzii	D1	0.03	1.19	2	3336.6069	65.179	63.989
Combretum collinum subsp. gazense	D1	0.34	0.823	63	158.2038	14.193	13.369
Combretum apiculatum subsp. apiculatum	D1	0.17	0.965	22	438.8294	23.638	22.673
Vachellia gerrardii	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Cissus cornifolia	D1	0.07	1.56	3	2867.0176	60.419	58.859
Combretum apiculatum subsp. apiculatum	D0.5	0.34	0.74	78	127.7477	12.754	12.014
Ormocarpum trichocarpum	D0.5	0.07	0.599	23	421.9971	23.18	22.581
Ormocarpum trichocarpum	D1	0.03	0.74	7	1290.2521	40.531	39.791
Cissus cornifolia	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Lannea discolor	D1	0.03	0.74	7	1290.2521	40.531	39.791
Schotia brachypetala	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Xerophyta retinervis	D0.5	0.13	0.457	81	123.0222	12.515	12.058
Totals for growth form:		368	29.493	833	46094.598	1220.372	1190.879

shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Combretum collinum subsp. gazense	S2	0.57	1.93	19	513.2508	25.563	23.633
Dichrostachys cinerea	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Terminalia sericea	S1.5	0.44	1.93	14	669.9685	28.207	27.277
Terminalia sericea	S2	0.34	1.56	17	567.7263	26.886	25.326
Dalbergia melanoxylon	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Flueggea virosa subsp. virosa	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Combretum collinum subsp. gazense	S1.5	0.57	1.56	29	335.3237	20.663	19.103
Sclerocarya birrea subsp. Caffra	S1.5	0.03	0.457	20	492.0888	25.031	24.574
Strychnos madagascariensis	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Vachellia gerrardii	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Diospyros lycioides subsp. sericea	S1.5	0.03	0.457	20	492.0888	25.031	24.574
Vachellia exuvialis	S2	0.03	1.19	2	3336.6069	65.179	63.989
Vachellia gerrardii	S2	0.03	0.74	7	1290.2521	40.531	39.791
Vachellia nilotica	S2	0.03	1.93	1	8776.5879	105.71	103.78
Combretum apiculatum subsp. apiculatum	S2	0.17	0.965	22	438.8294	23.638	22.673
Peltophorum africanum	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Combretum apiculatum subsp. apiculatum	S1.5	0.67	1.56	35	285.2754	19.058	17.498
Pterocarpus rotunidifolius subsp. rotunidifolius	S2	0.13	1.93	4	2194.147	52.855	50.925
Pterocarpus rotunidifolius subsp. rotunidifolius	S1.5	0.17	1.56	8	1146.807	38.212	36.652
Totals for growth form:		3.45	25.489	230	42957.559	889.445	863.956

Trees

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	T	0.07	2.53	1	7540.8823	97.986	95.456
Sclerocarya birrea subsp. caffra	T	0.3	5.07	1	6655.5762	92.055	86.985
Terminalia sericea	T	0.44	1.93	14	669.9685	29.207	27.277
Combretum collinum subsp. gazense	T	0.57	3.13	7	1349.9066	41.458	38.328
Vachellia exuvialis	T	0.03	1.93	1	8776.5879	105.71	103.78
Combretum apiculatum subsp. apiculatum	T	0.97	2.083	28	350.2239	21.117	19.033
Vachellia gerrardii	T	0.03	3.13	0	23083.402	171.437	168.307
Vachellia nilotica	T	0.03	1.93	1	8776.5879	105.71	103.78

Pterocarpus rotunidifolius subsp. rotunidifolius	T	0.13	1.93	4	2194.147	52.855	50.925
Totals for growth form:		2.58	23.663	60	59397.281	717.536	693.873
Totals for community:		9.71	78.645	1124	148449.44	2827.353	2748.708
Means for community:		0.16	1.268	18	131.9635	45.602	44.334

ANNEXURE C: Species cover relationships for the Satara Experimental Burn Plot

No Burn treatment

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Dichrostachys cinerea	D1	0.1	0.646	30	327.421	20.418	19.772
Grewia bicolor	D1	0.03	1.19	2	3336.6069	65.179	63.989
Sclerocarya birrea subsp. caffra	D1	0.03	0.282	53	187.374	15.446	15.164
Flueggea virosa subsp. virosa	D1	0.07	0.37	62	160.5459	14.311	39.791
Gymnosporia buxifolia	D1	0	0.457	2	4920.8887	79.155	78.698
Vachellia exuvialis	D1	0.03	0.74	7	1290.2521	40.531	39.791
Vachellia exuvialis	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Solanum panduriforme	D0.5	0.14	0.282	218	45.701	7.682	7.346
Ziziphus mucronata	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Philenoptera violacea	D1	0.07	0.457	40	246.0444	17.7	17.243
Ehretia amoena	D0.5	0.07	0.493	36	272.7003	18.634	18.141
Ehretia amoena	D1	0.17	0.599	59	168.7988	14.66	14.062
Ziziphus mucronata	D1	0.03	0.74	7	1290.2521	40.531	39.791
Combretum collinum subsp. gazense	D1	0.03	0.74	7	1290.2521	40.531	39.791
Senegalia nigrescens	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Combretum apiculatum subsp. apiculatum	D1	0.03	1.19	2	3336.6069	65.179	63.989
Aspargus setaceus	D0.5	0	0.17	14	680.9402	29.445	29.275
Senegalia nigrescens	D1	0.03	0.457	20	492.0888	25.031	24.574
Commiphora africana var. africana	D1	0.03	0.457	20	492.0888	25.031	24.574
Grewia flava	D1	0.03	0.74	7	1290.2521	40.531	39.791
Commiphora africana var. africana	D0.5	0.03	0.282	53	187.374	15.446	15.164
Combretum imberbe	D1	0.03	0.282	53	187.374	15.446	15.164
Totals for growth form:		1.11	12.684	771	22970.375	706.457	693.773

Shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	S2	0.03	1.19	2	3336.6069	65.179	63.989
Dichrostachys cinerea	S1.5	0.03	0.457	20	492.0888	25.031	24.574
Cassia abbreviata subsp. beareana	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Flueggea virosa subsp. virosa	S1.5	0.07	0.74	15	645.126	28.66	27.92
Vachellia exuvialis	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Philenoptera violacea	S2	0.13	0.74	31	322.563	20.266	19.526
Grewia bicolor	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Philenoptera violacea	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Diospyros lycioides subsp. sericea	S2	0.13	0.74	31	322.563	20.266	19.526
Diospyros lycioides subsp. sericea	S1.5	0.13	0.74	31	322.563	20.266	19.526
Vachellia exuvialis	S2	0.54	1.19	48	207.2427	16.244	15.054
Combretum apiculatum subsp. apiculatum	S2	0.03	0.74	7	1290.2521	40.531	39.791
Flueggea virosa subsp. virosa	S2	0.03	1.93	1	8776.5879	105.71	103.78

Commiphora africana var. africana	S1.5	0.17	1.56	8	1146.807	38.212	36.652
Grewia flava	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Grewia flava	S2	0.03	1.19	2	3336.6069	65.179	63.989
Commiphora africana var. africana	S2	0.47	0.89	75	132.3647	12.982	12.092
Ehretia amoena	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Combretum imberbe	S1.5	0.13	0.74	31	322.563	20.266	19.526
Combretum imberbe	S2	0.03	0.457	20	492.0888	25.031	24.574
Totals for growth form:		2.21	19.177	360	35023.609	820.86	801.682

Trees

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Diospyros lycioides subsp. sericea	T	0.13	1.19	11	834.1517	32.589	31.399
Combretum hereroense	T	0.03	1.19	2	3336.6069	65.179	63.989
Peltophorum africanum	T	0.03	1.19	2	3336.6069	65.179	63.989
Philenoptera violacea	T	0.13	1.19	11	834.1517	32.589	31.399
Combretum apiculatum subsp. apiculatum	T	0.03	1.19	2	3336.6069	65.179	63.989
Senegalia nigrescens	T	0.17	1.437	10	953.5708	34.844	33.408
Commiphora africana var. africana	T	0.17	1.56	8	1146.807	38.212	36.652
Combretum imberbe	T	0.27	1.56	13	716.7544	30.209	28.649
Cassia abbreviata subsp. beareana	T	0.13	1.19	11	834.1517	32.589	31.399
Pergularia daemia subsp. daemia	T	0.03	0.74	7	1290.2521	40.531	39.791
Totals for growth form:		1.14	12.437	85	16619.66	437.103	424.666
Totals for community:		4.46	44.298	1217	74613.641	1964.42	1920.121
Means for community:		0.08	0.836	23	61.2987	37.065	32.229

February Triennial Burn

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Dichrostachys cinerea	D1	0.2	0.796	40	248.6121	17.792	16.996
Grewia bicolor	D1	0.03	0.282	53	187.374	15.446	15.164
Sclerocarya birrea subsp. caffra	D1	0.07	0.796	40	248.6121	17.792	16.996
Sclerocarya birrea subsp. caffra	D0.5	0.04	0.457	22	447.3535	23.866	23.409
Dalbergia melanoxylon	D0.5	0.03	0.282	53	187.374	15.446	15.164
Euclea divinorum	D0.5	0	0.74	0	12902.523	128.172	127.432
Euclea natalensis subsp. angustifolia	D1	0.03	0.457	20	492.0888	25.031	24.574
Flueggea virosa subsp. virosa	D0.5	0.07	0.37	62	160.8459	14.311	13.941
Flueggea virosa subsp. virosa	D1	0.03	0.282	53	187.374	15.446	15.164
Vachellia exuvialis	D1	0.03	0.74	7	1290.2521	40.531	39.791
Vachellia exuvialis	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Solanum panduriforme	D0.5	0.03	0.282	53	187.374	15.446	15.164
Solanum panduriforme	D1	0.3	0.282	480	20.8193	5.149	4.867
Philenoptera violacea	D1	0.03	0.457	20	492.0888	25.031	24.574
Ehretia amoena	D1	0.07	0.599	23	421.9971	23.18	22.581

Senegalia nigrescens	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Senegalia nigrescens	D1	0.07	0.74	15	645.126	28.66	27.92
Maerua edulis	D0.5	0.13	0.282	213	46.8435	7.723	7.441
Commiphora africana var. africana	D1	0.03	0.457	20	492.0888	25.031	24.574
Grewia flava	D1	0.17	0.457	22	447.3535	23.866	23.409
Maerua edulis	D1	0.54	0.457	327	30.5645	6.238	5.781
Combretum imberbe	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Totals for growth form		2.04	11.494	1600	21892.09	589.458	577.965

Shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	S2	0.87	1.19	78	127.3514	12.734	11.544
Dichrostachys cinerea	S1.5	0.74	1.04	87	114.7955	12.09	11.05
Euclea divinorum	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Cassia abbreviata subsp. beareana	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Flueggea virosa subsp. virosa	S1.5	0.57	0.965	77	128.3127	12.782	11.817
Gymnosporia buxifolia	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Sclerocarya birrea subsp. caffra	S2	0.03	1.19	2	3336.6069	65.179	63.989
Philenoptera violacea	S2	0.13	1.19	11	834.1517	32.589	31.399
Cassia abbreviata subsp. beareana	S2	0.03	0.74	7	1290.2521	40.531	39.791
Philenoptera violacea	S1.5	0.17	0.599	59	168.7988	14.66	14.062
Peltophorum africanum	S2	0	1.93	0	87765.891	334.286	332.356
Ziziphus mucronata	S1.5	0	0.74	0	12902.523	128.172	127.432
Cissus cornifolia	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Vachellia exuvialis	S2	0.03	1.93	1	8776.5879	105.71	103.78
Flueggea virosa subsp. virosa	S2	0.13	1.93	4	2194.147	52.855	50.925
Balanites maughamii	S1.5	0.13	1.19	11	834.1517	32.589	31.399
Commiphora africana var. africana	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Grewia flava	S1.5	0.07	0.965	9	1097.0736	37.374	36.409
Ehretia amoena	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Combretum imberbe	S1.5	0.13	1.19	11	834.1517	32.589	31.399
Aspargus setaceus	S1.5	0.03	0.282	53	187.374	15.446	15.164
Maerua edulis	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Pergularia daemia subsp. daemia	S1.5	0.03	0.457	20	492.0888	25.031	24.574
Capparis tomentosa	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Totals for growth form:		3.39	28.078	463	156610.75	1532.47	1504.389

Trees

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	T	0.13	1.19	11	834.1517	32.589	31.399
Sclerocarya birrea subsp. caffra	T	0	1.19	0	33366.074	206.114	204.924
Philenoptera violacea	T	0.27	1.19	23	417.0759	23.044	21.854
Grewia bicolor	T	0.03	1.93	1	8776.5879	105.71	103.78
Senegalia nigrescens	T	0.13	3.13	1	5770.8506	85.719	82.589
Balanites maughamii	T	0.13	1.19	11	834.1517	32.589	31.399
Commiphora africana var. africana	T	0.17	1.56	8	1146.807	38.212	36.652
Grewia flava	T	0.03	1.19	2	3336.6069	65.179	63.989
Combretum imberbe	T	0.13	3.13	1	5770.8506	85.719	82.589

Totals for growth form:		1.04	15.7	64	60253.16	674.876	659.176
Totals for community:		6.47	55.271	2128	238756	2796.8	2741.529
Means for community:		0.12	0.987	38	112.169	49.943	48.956

August Triennial Burn

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	D0.5	0.44	0.457	266	37.564	6.916	6.459
Dichrostachys cinerea	D1	0.37	0.493	193	51.592	8.105	7.612
Sclerocarya birrea subsp. caffra	D1	0.03	0.457	20	492.0888	25.031	24.574
Sclerocarya birrea subsp. caffra	D0.5	0.07	0.457	40	246.0444	17.7	17.243
Flueggea virosa subsp. virosa	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Flueggea virosa subsp. virosa	D1	0.17	1.335	11	839.8538	32.701	31.366
Vachellia exuvialis	D1	0.03	0.457	20	492.0888	25.031	24.574
Vachellia exuvialis	D0.5	0.1	0.282	159	62.6057	8.928	8.646
Solanum panduriforme	D0.5	0.13	0.282	213	46.8435	7.723	7.441
Solanum panduriforme	D1	0.27	0.457	162	61.511	8.85	8.393
Ziziphus mucronata	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Philenoptera violacea	D1	0.03	1.19	2	3336.6069	65.179	63.989
Ehretia amoena	D0.5	0.03	1.19	2	3336.6069	65.179	63.989
Ehretia amoena	D1	0.2	0.587	73	135.4656	13.133	12.546
Senegalia nigrescens	D1	0.03	0.74	7	1290.2521	40.531	39.791
Commiphora africana var. africana	D1	0.03	0.74	7	1290.2521	40.531	39.791
Grewia flava	D1	0.07	0.965	9	1097.0736	37.374	36.409
Commiphora africana var. africana	D0.5	0.03	0.282	53	187.374	15.446	15.164
Aspargus setaceus	D1	0	0.282	5	1873.7402	478.844	48.562
Totals for growth form:		2.11	11.568	1292	15864.741	517.263	505.696

Shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	S2	0.13	1.19	11	834.1517	32.589	31.399
Dichrostachys cinerea	S1.5	0.61	1.56	31	315.0569	20.029	18.469
Vachellia exuvialis	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Grewia bicolor	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Grewia flavescens	S1.5	0	1.19	0	33366.074	206.114	204.924
Vachellia exuvialis	S2	0.03	1.19	2	3336.6069	65.179	63.989
Senegalia nigrescens	S2	0.03	0.74	7	1290.2521	40.531	39.791
Commiphora africana var. africana	S1.5	0.13	0.74	31	322.563	20.266	19.526
Grewia flava	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Commiphora africana var. africana	S2	0.13	1.93	4	2194.147	52.855	50.925
Ehretia amoena	S1.5	0.13	1.19	11	834.1517	32.589	31.399
Combretum imberbe	S2	0.13	1.19	11	834.1517	32.589	31.399
Totals for growth form:		1.44	14.04	128	51290.621	673.632	659.592

Trees

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	T	0.03	1.19	2	3336.6069	65.179	63.989
Gymnosporia buxifolia	T	0	0.457	2	4920.8887	79.155	78.698
Searsia pyroides var. pyroides	T	0.03	1.19	2	3336.6069	65.179	63.989
Combretum hereroense	T	0.17	1.935	5	1764.4246	47.398	45.463
Vachellia exuvialis	T	0.13	1.19	11	834.1517	32.589	31.399
Senegalia nigrescens	T	1.28	2.73	21	458.4983	24.162	21.432
Combretum imberbe	T	0.67	1.56	35	285.2754	19.058	17.498
Cassia abbreviata subsp. beareana	T	0.03	1.19	2	3336.6069	65.179	63.989
Vachellia tortilis subsp. heteracantha	T	0.03	1.93	1	8776.8579	105.71	103.78
Totals for growth form:		2.38	13.372	86	27049.648	503.609	490.237
Totals for community:		5.94	38.98	1507	94202.008	1694.5	1655.525
Means for community:		0.15	0.974	38	62.4877	42.363	41.388

August Annual Burn

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	D0.5	0.57	0.457	347	28.7771	6.053	5.596
Dichrostachys cinerea	D1	0.17	0.457	101	98.4178	11.194	10.737
Grewia bicolor	D0.5	0.03	0.282	53	187.374	15.446	15.164
Sclerocarya birrea subsp. caffra	D0.5	0.07	0.457	40	246.0444	17.7	17.243
Flueggea virosa subsp. virosa	D0.5	0.13	0.282	213	46.8435	7.723	7.441
Flueggea virosa subsp. virosa	D1	0.07	1.19	5	1668.3035	46.089	44.899
Vachellia exuvialis	D0.5	0.07	0.599	23	421.9971	23.18	22.581
Solanum panduriforme	D0.5	0.17	0.399	136	73.4278	9.669	9.27
Ziziphus mucronata	D0.5	0.03	0.282	53	187.374	15.446	15.164
Philenoptera violacea	D1	0.03	0.74	7	1290.2521	40.531	39.791
Ehretia amoena	D0.5	0.2	0.363	193	51.7456	8.117	7.754
Pappea capensis	D0.5	0.03	1.19	2	3336.6069	65.179	63.989
Senegalia nigrescens	D0.5	0.07	0.457	40	246.0444	17.7	17.243
Cissus cornifolia	D1	0.03	1.19	2	3336.6069	65.179	63.989
Senegalia nigrescens	D1	0.13	0.74	31	322.563	20.266	19.526
Maerua edulis	D0.5	0.03	0.282	53	187.374	15.446	15.164
Grewia flava	D1	0.07	0.823	12	798.9292	31.894	31.071
Grewia flava	D0.5	0.03	0.282	53	187.374	15.446	15.164
Aspargus setaceus	D1	0	0.282	5	1873.7402	48.844	48.862
Totals for growth form:		1.94	10.754	1379	14589.796	481.1	470.346

Shrubs

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	S2	0.03	3.13	0	23083.402	171.437	168.307
Combretum hereroense	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Flueggea virosa subsp. virosa	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Gymnosporia buxifolia	S2	0.03	1.93	1	8776.5879	105.71	103.78
Philenoptera violacea	S1.5	0.07	1.19	5	1668.3035	46.089	44.899
Pappea capensis	S1.5	0	1.93	0	87765.891	334.286	332.356
Diospyros lycioides subsp. sericea	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Cissus cornifolia	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Vachellia tortilis subsp. heteracantha	S2	0	1.93	0	87765.891	334.286	332.356
Combretum imberbe	S1.5	0.13	1.19	11	834.1517	32.589	31.399
Senegalia nigrescens	S1.5	0.03	0.457	20	492.0888	25.031	24.574
Totals for growth form:		0.44	16.067	56	221686.39	1285.5	1269.43

Trees

Species	Height class code	Mean cover %	Mean can, Dia, (m)	ind./ ha.	Area per individ, sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Sclerocarya birrea subsp. caffra	T	0.07	5.665	0	37807.758	219.404	213.74
Philenoptera violacea	T	0	1.19	0	33366.074	206.114	204.924
Combretum apiculatum subsp. apiculatum	T	0.03	1.93	1	8776.5879	105.71	103.78
Senegalia nigrescens	T	0.34	2.16	9	1088.4219	37.227	35.067
Combretum imberbe	T	0.03	3.13	0	23083.402	171.437	168.307
Totals for growth form:		0.47	14.075	11	104122.23	739.893	725.818
Totals for community:		2.86	40.896	1447	340398.44	2506.49	2465.594
Means for community:		0.08	1.168	41	235.2039	71.614	70.446

ANNEXURE D: Species cover relationships for the Mopani Experimental Burn Plot

No Burn treatment

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	D0.5	0.07	0.457	40	246.0444	17.7	17.243
Dichrostachys cinerea	D1	0.03	0.067	945	10.577	3.67	3.603
Grewia bicolor	D0.5	0	0.282	5	1873.7402	48.844	48.562
Flueggea virosa subsp. virosa	D1	0.03	0.74	7	1290.2521	40.531	39.791
Vachellia exuvialis	D1	0.03	0.067	20	10.577	3.67	3.603
Vachellia exuvialis	D0.5	0.07	0.599	23	421.9971	23.18	22.581
Solanum panduriforme	D0.5	0.13	0.457	81	123.0222	12.515	12.058
Senegalia nigrescens	D0.5	0.13	0.282	213	46.8435	7.723	7.441
Cissus cornifolia	D1	0.07	2.53	1	7540.8823	97.986	95.456
Ormocarpum trichocarpum	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Ormocarpum trichocarpum	D1	0.03	1.19	2	3336.6069	65.179	63.989
Lannea schweinfurthii	D1	0.03	0.74	7	1290.2521	40.531	39.791
Aspargus setaceus	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Commiphora africana var. africana	D1	0.03	0.457	20	492.0888	25.031	24.574
Commiphora africana var. africana	D0.5	0.07	0.455	41	243.8956	17.622	17.167
Colophospermum mopane	D0.5	0.07	0.74	15	645.126	28.66	27.92
Colophospermum mopane	D1	0.03	1.19	2	3336.6069	65.179	63.989
Commiphora glandulosa	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Commiphora glandulosa	D1	0.03	1.93	1	8776.5879	105.71	103.78
Totals for growth form:		0.97	14.227	1479	32441.041	715.686	701.46

Shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Philenoptera violacea	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Flueggea virosa subsp. virosa	S2	0.03	1.93	1	8776.5879	105.71	103.78
Commiphora africana var. africana	S2	0.03	1.19	2	3336.6069	65.179	63.989
Colophospermum mopane	S2	5.54	1.93	189	52.7756	8.197	6.267
Colophospermum mopane	S1.5	2.82	1.437	173	57.4848	8.555	7.119
Jasminum stenolobum	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Totals for growth form:		8.5	8.867	373	18896.67	318	309.133

Trees

Species	Height class code	Mean cover %	Mean can. Dia, (m)	ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Philenoptera violacea	T	0.03	1.93	1	8776.5879	105.71	103.78
Vachellia exuvialis	T	0.03	0.457	20	492.0888	25.031	24.574
Colophospermum mopane	T	11.56	2.33	271	36.8951	6.854	4.524
Terminalia prunioides	T	0.3	5.07	1	6655.5762	92.055	86.985
Commiphora glandulosa	T	0.03	1.93	1	8776.5879	105.71	103.78

Totals for growth form:		11.96	11.717	295	24737.736	335.361	323.644
Totals for community:		21.43	34.333	2148	76075.445	1369.047	1334.237
Means for community:		0.71	1.16	72	35.4152	45.635	44.475

February Triennial Burn

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea							
Dichrostachys cinerea	D1	0.03	0.74	7	1290.2521	40.531	39.791
Flueggea virosa subsp. virosa	D1	0.03	0.74	7	1290.2521	40.531	39.791
Solanum panduriforme	D0.5	0.03	0.282	53	187.374	15.446	15.164
Senegalia nigrescens	D0.5	0.13	0.74	31	322.563	20.266	19.526
Lannea schweinfurthii	D0.5	0	0.74	0	12902.523	128.172	127.432
Aspargus setaceus	D0.5	0.03	0.282	53	187.374	15.446	15.164
Senegalia nigrescens	D1	0.13	0.74	31	322.563	20.266	19.526
Commiphora africana var. africana	D1	0.27	0.511	130	76.9065	9.895	9.384
Commiphora africana var. africana	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Aspargus setaceus	D1	0	0.457	2	4920.8887	79.155	78.698
Colophospermum mopane	D0.5	0.2	0.547	85	117.6423	12.239	11.691
Colophospermum mopane	D1	0.3	0.89	48	207.3713	16.249	15.359
Totals for growth form:		1.24	7.583	490	22809.885	448.258	440.674

Shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Commiphora africana var. africana	S1.5	0.03	1.19	2	3336.6069	65.179	63.989
Commiphora africana var. africana	S2	0.03	0.74	7	1290.2521	40.531	39.791
Colophospermum mopane	S2	5.41	1.683	243	41.137	7.237	5.554
Colophospermum mopane	S1.5	1.78	1.04	209	47.724	7.795	6.755
Totals for growth form:		7.26	4.653	463	4715.7202	120.743	116.089

Trees

Species	Height class code	Mean cover %	Mean can. Dia, (m)	ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Philenoptera violacea	T	0.03	1.93	1	8776.5879	105.71	103.78
Commiphora africana var. africana	T	0.03	1.93	1	8776.5879	105.71	103.78
Colophospermum mopane	T	12.09	2.33	283	35.2578	6.7	4.37
Jasminum stenolobum	T	0	0.74	0	12902.523	128.172	127.432
Totals for growth form:		12.16	6.93	286	30490.957	346.293	339.363

Totals for community:	20.66	19.167	1241	58016.563	915.293	896.127
Means for community:	0.98	0.913	59	46.7498	43.585	42.673

August Triennial Burn

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	D0.5	0.03	0.17	146	68.094	9.311	9.141
Grewia bicolor	D0.5	0.03	0.282	53	187.374	15.446	15.146
Solanum lichtensteinii	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Pappea capensis	D1	0	0.457	2	4920.8887	79.155	78.698
Combretum apiculatum subsp. apiculatum	D1	0.03	1.19	2	3336.6069	65.179	63.989
Commiphora africana var. africana	D1	0.13	1.19	11	834.1517	32.589	31.399
Commiphora africana var. africana	D0.5	0.17	0.457	101	98.4178	11.194	10.737
Colophospermum mopane	D0.5	0.6	0.769	121	82.4128	10.244	9.448
Colophospermum mopane	D1	0.6	1.533	32	306.0594	19.74	18.207
Totals for growth form:		1.64	6.532	493	10326.095	267.889	261.357

Shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Colophospermum mopane	S2	7.16	2.083	209	47.6318	7.788	5.704
Colophospermum mopane	S1.5	1.11	1.437	68	146.4823	13.657	12.22
Senna petersiana	S2	0.03	1.93	1	8776.5879	105.71	103.78
Totals for growth form:		8.3	5.45	279	8970.7021	127.155	121.705

Trees

Species	Height class code	Mean cover %	Mean can. Dia, (m)	ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Combretum apiculatum subsp. apiculatum	T	0.03	3.13	0	23083.402	171.437	168.307
Combretum imberbe	T	0.03	1.93	1	8776.5879	105.71	103.78
Colophospermum mopane	T	5.1	3.377	56	175.4738	14.947	11.571
Totals for growth form:		517	8.437	58	32035.465	292.095	283.658
Totals for community:		15.11	20.419	831	51332.262	687.139	666.72
Means for community:		1.01	1.361	55	61.7644	45.809	44.448

August Annual Burn

Dwarf shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Dichrostachys cinerea	D0.5	0.03	0.17	146	68.094	9.311	9.141
Grewia bicolor	D1	0.13	0.457	81	123.0222	12.515	12.058
Philenoptera violacea	D0.5	0	0.457	2	4920.8887	79.155	78.698
Vachellia exuvialis	D0.5	0.03	0.17	146	68.074	9.311	9.141
Combretum apiculatum subsp. apiculatum	D1	0.03	0.74	7	1290.2521	40.531	39.791
Cissus cornifolia	D1	0.03	1.19	2	3336.6069	65.179	63.989
Ormocarpum trichocarpum	D0.5	0.34	0.599	119	83.5638	10.315	9.716
Ormocarpum trichocarpum	D1	0.34	0.599	119	83.5638	10.315	9.716
Commiphora africana var. africana	D1	0.13	1.19	11	834.1517	32.589	31.399
Commiphora africana var. africana	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Aspargus setaceus	D1	0	0.457	2	4920.8887	79.155	78.698
Colophospermum mopane	D0.5	1.75	0.965	238	41.873	7.302	6.337
Colophospermum mopane	D1	3.53	1.19	317	31.5369	6.337	5.147
Terminalia prunioides	D0.5	0.03	0.74	7	1290.2521	40.531	39.791
Commiphora glandulosa	D0.5	0.03	0.457	20	492.0888	25.031	24.574
Totals for growth form:		6.45	9.837	1245	18076.965	452.609	442.772

Shrubs

Species	Height class code	Mean cover %	Mean can. Dia, (m)	ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Philenoptera violacea	S1.5	0	1.19	0	33366.074	206.114	204.924
Cissus cornifolia	S1.5	0.03	1.93	1	8776.5879	105.71	103.78
Commiphora africana var. africana	S1.5	0.03	0.74	7	1290.2521	40.531	39.791
Colophospermum mopane	S2	6.22	1.437	383	26.0622	5.761	4.324
Colophospermum mopane	S1.5	7.42	1.56	388	25.7478	5.726	4.166
Totals for growth form:		13.71	6.857	781	43484.727	363.842	356.985

Trees

Species	Height class code	Mean cover %	Mean can. Dia, (m)	ind./ ha.	Area per individ. sq m	Spacing cen-cen (m)	Spacing gap-gap (m)
Colophospermum mopane	T	4.6	2.083	135	74.0517	9.71	7.627
Totals for growth form:		4.6	2.083	135	74.0517	9.71	7.627
Totals for community:		24.77	18.777	2161	61635.742	826.161	807.384
Means for community:		1.18	0.894	103	28.512	39.341	38.447

ANNEXURE E: Community composition analysis grouped according to growth forms for the Pretoriuskop Experimental Burn Plot

No Burn treatment

Trees

Correlation coefficient = +0.40
Standard error of the mean = 2.36

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	T	3	11.82	2.28	+9.55
Normal competition range:					
Dichrostachys cinerea	T	2	1.75	1.07	+0.67
Pappea capensis	T	3	0.6	2.28	-1.67
Combretum molle	T	2	0.57	1.07	-0.5
Dalbergia melanoxylon	T	2	0.44	1.07	-0.64
Albizia harveyi	T	3	0.3	2.28	-1.98
Strychnos madagascariensis	T	3	0.2	2.28	-2.08
Searsia pyroides var. pyroides	T	2	0.17	1.07	-0.91
Diospyros lycioides subsp. sericea	T	2	0.17	1.07	-0.91
Spirostachys africana	T	3	0.1	2.28	-2.18
Boscia albitrunca	T	2	0.07	1.07	-1.01
Ximenia caffra	T	1	0.03	-0.13	+0.16
Diospyros mespiliformis	T	1	0.03	-0.13	+0.16
Gymnosporia buxifolia	T	1	0.03	-0.13	+0.16
Olea europaea subsp. cuspidata	T	1	0.03	-0.13	+0.16
Euclea natalensis subsp. angustifolia	T	1	0.03	-0.13	+0.16
Peltophorum africanum	T	1	0.03	-0.13	+0.16
Catunaregam spinosa	T	1	0.03	-0.13	+0.16
Antidesma venosum	T	1	0	-0.13	+0.13
Sclerocarya birrea subsp. caffra	T	1	0	-0.13	+0.13
Euclea divinorum	T	1	0	-0.13	+0.13
Psydrax locuples	T	1	0	-0.13	+0.13
Total cover for species in group:			16.43		

Shrubs

Correlation coefficient = +0.51
Standard error of the mean = 0.55

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	S2	3	3.39	0.81	+2.59
Euclea natalensis subsp. angustifolia	S1.5	3	2.32	0.81	+1.51
Gymnosporia buxifolia	S2	2	1.24	0.43	+0.82

Dichrostachys cinerea	S1.5	3	1.45	0.81	+0.64
Dichrostachys cinerea	S2	3	1.45	0.81	+0.64

Normal competition range:

Diospyros mespiliformis	S2	1	0.54	0.05	+0.49
Terminalia sericea	S1.5	3	1.18	0.81	+0.37
Diospyros mespiliformis	S1.5	2	0.57	0.43	+0.14
Euclea natalensis subsp. angustifolia	S2	1	0.13	0.05	+0.09
Dalbergia melanoxylon	S2	1	0.13	0.05	+0.09
Jasminum fluminense	S2	1	0.13	0.05	+0.09
Olea europaea subsp. cuspidata	S2	1	0.13	0.05	+0.09
Olea europaea subsp. cuspidata	S1.5	1	0.13	0.05	+0.09
Antidesma venosum	S2	1	0.13	0.05	+0.09
Rhoicissus tridentata subsp. cuneifolia	S1.5	1	0.13	0.05	+0.09
Zanthoxylum humile	S2	1	0.03	0.05	-0.01
Diospyros lycioides subsp. sericea	S1.5	1	0.03	0.05	-0.01
Diospyros lycioides subsp. sericea	S2	1	0.03	0.05	-0.01
Pappea capensis	S1.5	1	0.03	0.05	-0.01
Combretum molle	S2	1	0.03	0.05	-0.01
Antidesma venosum	S1.5	1	0.03	0.05	-0.01
Ziziphus mucronata	S2	1	0.03	0.05	-0.01
Strychnos madagascariensis	S2	1	0.03	0.05	-0.01
Grewia flavescens	S1.5	1	0.03	0.05	-0.01
Sclerocarya birrea subsp. caffra	S1.5	1	0.03	0.05	-0.01
Philenoptera violacea	S1.5	1	0.03	0.05	-0.01
Searsia gueinzii	S2	1	0.03	0.05	-0.01
Combretum molle	S1.5	1	0.03	0.05	-0.01
Pavetta schumanniana	S1.5	1	0.03	0.05	-0.01
Mundulea sericea subsp. sericea	S2	1	0.03	0.05	-0.01
Mundulea sericea subsp. sericea	S1.5	1	0.03	0.05	-0.01
Manilkara mochisia	S2	1	0.03	0.05	-0.01
Combretum hereroense	S1.5	1	0.03	0.05	-0.01
Strychnos madagascariensis	S1.5	1	0	0.05	-0.04
Combretum collinum subsp. gazense	S1.5	1	0	0.05	-0.04
Parinari curatellifolia	S1.5	1	0	0.05	-0.04
Zanthoxylum humile	S1.5	2	0.17	0.43	-0.26
Psydrax locuples	S2	2	0.17	0.43	-0.26
Peltophorum africanum	S2	2	0.07	0.43	-0.36
Catunaregam spinosa	S2	2	0.07	0.43	-0.36
Sclerocarya birrea subsp. caffra	S2	2	0.07	0.43	-0.36
Searsia pyroides var. pyroides	S1.5	2	0.07	0.43	-0.36
Searsia gueinzii	S1.5	2	0.07	0.43	-0.36

Weak competitors:

Gymnosporia buxifolia	S1.5	3	0.2	0.81	-0.61
Flueggea virosa subsp. virosa	S1.5	3	0.2	0.81	-0.61
Dalbergia melanoxylon	S1.5	3	0.2	0.81	-0.61
Psydrax locuples	S1.5	3	0.2	0.81	-0.61
Euclea divinorum	S2	3	0.2	0.81	-0.61
Euclea divinorum	S1.5	3	0.2	0.81	-0.61
Catunaregam spinosa	S1.5	3	0.1	0.81	-0.71
Cassia abbreviata subsp. beareana	S1.5	3	0.07	0.81	-0.74

Total cover for species in group: 15.71

Dwarf Shrubs

Correlation coefficient = +0.47
Standard error of the mean = 0.19

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	D1	2	1.07	0.18	+0.89
Terminalia sericea	D0.5	3	0.87	0.3	+0.57
Dichrostachys cinerea	D0.5	3	0.74	0.3	+0.44
Dichrostachys cinerea	D1	3	0.57	0.3	+0.27
Pavetta schumanniana	D1	1	0.3	0.06	+0.24
Normal competition range:					
Cassia abbreviata subsp. beareana	D0.5	2	0.27	0.18	+0.09
Euclea natalensis subsp. angustifolia	D1	3	0.2	0.3	-0.1
Zanthoxylum humile	D1	3	0.2	0.3	-0.1
Diospyros mespiliformis	D1	3	0.2	0.3	-0.1
Antidesma venosum	D1	3	0.2	0.3	-0.1
Flueggea virosa subsp. virosa	D0.5	2	0.17	0.18	-0.01
Euclea divinorum	D0.5	2	0.17	0.18	-0.01
Gymnosporia buxifolia	D0.5	2	0.17	0.18	-0.01
Cassia abbreviata subsp. beareana	D1	3	0.2	0.3	-0.1
Pappea capensis	D1	2	0.17	0.18	-0.01
Searsia gueinzii	D0.5	2	0.07	0.18	-0.11
Searsia gueinzii	D1	1	0.13	0.06	+0.07
Grewia flavescens	D1	1	0.13	0.06	+0.07
Psydrax locuples	D0.5	2	0.07	0.18	-0.11
Peltophorum africanum	D1	1	0.13	0.06	+0.07
Combretum molle	D1	1	0.13	0.06	+0.07
Searsia pyroides var. pyroides	D1	2	0.07	0.18	-0.11
Ozoroa sphaerocarpa	D1	1	0.03	0.06	-0.03
Ozoroa sphaerocarpa	D0.5	2	0.07	0.18	-0.11
Lantana camara	D0.5	2	0.04	0.18	-0.14
Euclea natalensis subsp. Angustifolia	D0.5	2	0.04	0.18	-0.14
Parinari curatellifolia	D0.5	1	0.03	0.06	-0.03
Sclerocarya birrea subsp. caffra	D1	1	0.03	0.06	-0.03
Philenoptera violacea	D0.5	1	0.03	0.06	-0.03
Parinari curatellifolia	D1	1	0.03	0.06	-0.03
Grewia flavescens	D0.5	1	0.03	0.06	-0.03
Grewia bicolor	D1	1	0.03	0.06	-0.03
Diospyros lycioides subsp. sericea	D1	1	0.03	0.06	-0.03
Lantana camara	D1	1	0.03	0.06	-0.03
Philenoptera violacea	D1	1	0.03	0.06	-0.03
Gymnosporia buxifolia	D1	1	0.03	0.06	-0.03
Flueggea virosa subsp. virosa	D1	1	0.03	0.06	-0.03
Dalbergia melanoxylon	D1	1	0.03	0.06	-0.03
Psydrax locuples	D1	1	0.03	0.06	-0.03
Euclea divinorum	D1	1	0	0.06	-0.06
Solanum panduriforme	D1	1	0	0.06	-0.06
Solanum panduriforme	D0.5	1	0.03	0.06	-0.03
Catunaregam spinosa	D0.5	1	0.03	0.06	-0.03
Strychnos madagascariensis	D0.5	1	0.03	0.06	-0.03
Combretum collinum subsp. gazense	D0.5	1	0.03	0.06	-0.03
Pavetta schumanniana	D0.5	1	0.03	0.06	-0.03

Weak competitors:

Dalbergia melanoxylon	D0.5	3	0.1	0.3	-0.2
Sclerocarya birrea subsp. caffra	D0.5	3	0.1	0.3	-0.2
Catunaregam spinosa	D1	3	0.1	0.3	-0.2
Strychnos madagascariensis	D1	3	0.07	0.3	-0.23

Total cover for species in group: 7.38

Community Structure

Growth Form

Tree	16.43
Shrub	15.71
Dwarf shrub	7.38
Total class cover	39.51
Dwarf shrub proportion	18.67
Shrub proportion	39.76
Tree proportion	41.57

February Triennial Burn

Trees

Correlation coefficient = +0.35
Standard error of the mean = 2.09

	Height class	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	T	3	8.13	1.65	+6.48
Normal competition range:					
Combretum collinum subsp. gazense	T	3	1.45	1.65	-0.2
Euclea natalensis subsp. angustifolia	T	1	1.21	0.09	+1.12
Piliostigma thonningii	T	3	0.4	1.65	-1.25
Ximenia caffra	T	3	0.3	1.65	-1.35
Peltophorum africanum	T	3	0.2	1.65	-1.45
Albizia versicolor	T	3	0.2	1.65	-1.45
Dichrostachys cinerea	T	2	0.07	0.87	-0.8
Searsia gueinzii	T	2	0.07	0.87	-0.8
Antidesma venosum	T	1	0.03	0.09	-0.06
Sclerocarya birrea subsp. caffra	T	1	0.03	0.09	-0.06
Euclea divinorum	T	1	0.03	0.09	-0.06
Searsia pyroides var. pyroides	T	1	0.03	0.09	-0.06
Gymnosporia buxifolia	T	1	0	0.09	-0.09

Total cover for species in group: 12.16

Shrubs

Correlation coefficient = +0.53
Standard error of the mean = 1.00

	Height class	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	S2	3	6.79	1.56	+5.23
Normal competition range:					
Terminalia sericea	S1.5	3	1.82	1.56	+0.26
Searsia pyroides var. pyroides	S2	3	0.91	1.56	-0.65
Parinari curatellifolia	S1.5	3	0.74	1.56	-0.82
Pappea capensis	S2	2	0.27	0.73	-0.47
Dombeya rotundifolia var. rotundifolia	S1.5	2	0.17	0.73	-0.57
Diospyros lycioides subsp. sericea	S1.5	2	0.17	0.73	-0.57
Euclea natalensis subsp. angustifolia	S1.5	2	0.17	0.73	-0.57
Ziziphus mucronata	S2	2	0.07	0.73	-0.67
Peltophorum africanum	S1.5	2	0.07	0.73	-0.67
Sclerocarya birrea subsp. caffra	S1.5	2	0.07	0.73	-0.67
Grewia bicolor	S1.5	2	0.07	0.73	-0.67
Searsia gueinzii	S1.5	2	0.07	0.73	-0.67
Piliostigma thonningii	S2	1	0.03	-0.09	+0.13
Combretum collinum subsp. gazense	S2	1	0.03	-0.09	+0.13
Combretum molle	S2	1	0.03	-0.09	+0.13
Vachellia exuvialis	S2	1	0.03	-0.09	+0.13
Pavetta schumanniana	S2	1	0.03	-0.09	+0.13
Dalbergia melanoxylon	S1.5	1	0.03	-0.09	+0.13
Cassia abbreviata subsp. beareana	S1.5	1	0.03	-0.09	+0.13
Psydrax locuples	S1.5	1	0.03	-0.09	+0.13
Searsia pyroides var. pyroides	S1.5	1	0.03	-0.09	+0.13
Piliostigma thonningii	S1.5	1	0.03	-0.09	+0.13
Combretum collinum subsp. gazense	S2	1	0.03	-0.09	+0.13
Gymnosporia buxifolia	S2	1	0.03	-0.09	+0.13
Gymnosporia buxifolia	S1.5	1	0.03	-0.09	+0.13
Searsia gueinzii	S1.5	1	0.03	-0.09	+0.13
Euclea divinorum	S1.5	1	0.03	-0.09	+0.13
Dichrostachys cinerea	S2	1	0.03	-0.09	+0.13
Strychnos madagascariensis	S1.5	1	0.03	-0.09	+0.13
Antidesma venosum	S1.5	1	0.03	-0.09	+0.13
Philenoptera violacea	S2	1	0.03	-0.09	+0.13
Flueggea virosa subsp. virosa	S1.5	1	0.03	-0.09	+0.13
Diospyros mespiliformis	S1.5	1	0.03	-0.09	+0.13
Dichrostachys cinerea	S1.5	1	0.03	-0.09	+0.13
Weak competitors:					
Euclea divinorum	S2	3	0.3	1.56	-1.26
Total cover for species in group:			12.39		

Dwarf Shrubs

Correlation coefficient = +0.52

Standard error of the mean = 0.26

	Height class	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	D1	3	1.65	0.42	+1.23
Terminalia sericea	D0.5	3	1.65	0.42	+1.23
Normal competition range:					
Diospyros lycioides subsp. sericea	D0.5	3	0.4	0.42	-0.02
Pappea capensis	D1	3	0.4	0.42	-0.02
Searsia pyroides var. pyroides	D0.5	3	0.3	0.42	-0.12
Searsia gueinzii	D0.5	3	0.2	0.42	-0.22
Ziziphus mucronata	D1	3	0.2	0.42	-0.22
Piliostigma thonningii	D1	2	0.17	0.2	-0.04
Vangueria infausta	D1	2	0.17	0.2	-0.04
Vachellia exuvialis	D0.5	2	0.17	0.2	-0.04
Strychnos madagascariensis	D1	2	0.07	0.2	-0.14
Flueggea virosa subsp. virosa	D1	2	0.07	0.2	-0.14
Flueggea virosa subsp. virosa	D0.5	2	0.17	0.2	-0.04
Euclea natalensis subsp. angustifolia	D1	2	0.07	0.2	-0.14
Psydrax locuples	D1	2	0.07	0.2	-0.14
Diospyros mespiliformis	D0.5	2	0.17	0.2	-0.04
Combretum molle	D0.5	2	0.07	0.2	-0.14
Sclerocarya birrea subsp. caffra	D1	2	0.07	0.2	-0.14
Rhoicissus tridentata subsp. cuneifolia	D0.5	2	0.07	0.2	-0.14
Annona senegalensis subsp. senegalensis	D1	2	0.07	0.2	-0.14
Grewia flavescens	D0.5	2	0.07	0.2	-0.14
Grewia bicolor	D1	2	0.07	0.2	-0.14
Euclea divinorum	D1	2	0.07	0.2	-0.14
Diospyros lycioides subsp. sericea	D1	2	0.04	0.2	-0.17
Cassia abbreviata subsp. beareana	D1	1	0.03	-0.01	+0.05
Cassia abbreviata subsp. beareana	D0.5	2	0.07	0.2	-0.14
Antidesma venosum	D1	1	0.03	-0.01	+0.05
Ochna pulchra	D0.5	2	0.07	0.2	-0.14
Dichrostachys cinerea	D1	1	0.03	-0.01	+0.05
Dichrostachys cinerea	D0.5	2	0.07	0.2	-0.14
Solanum panduriforme	D1	1	0.03	-0.01	+0.05
Parinari curatellifolia	D0.5	2	0.04	0.2	-0.17
Combretum collinum subsp. gazense	D0.5	1	0.03	-0.01	+0.05
Strychnos madagascariensis	D0.5	1	0.03	-0.01	+0.05
Parinari curatellifolia	D1	1	0.03	-0.01	+0.05
Solanum panduriforme	D0.5	1	0.03	-0.01	+0.05
Combretum collinum subsp. gazense	D1	1	0.03	-0.01	+0.05
Searsia gueinzii	D1	1	0.03	-0.01	+0.05
Ehretia amoena	D0.5	1	0.03	-0.01	+0.05
Combretum molle	D1	1	0.03	-0.01	+0.05
Antidesma venosum	D0.5	1	0.03	-0.01	+0.05
Vachellia exuvialis	D1	1	0.03	-0.01	+0.05
Searsia pyroides var. pyroides	D1	1	0.03	-0.01	+0.05
Diospyros mespiliformis	D1	1	0.03	-0.01	+0.05
Pavetta schumanniana	D1	1	0.03	-0.01	+0.05
Catunaregam spinosa	D0.5	1	0.03	-0.01	+0.05
Sclerocarya birrea subsp. caffra	D0.5	1	0.03	-0.01	+0.05

Pavetta schumanniana	D0.5	1	0.03	-0.01	+0.05
Annona senegalensis subsp. senegalensis	D0.5	1	0.03	-0.01	+0.05
Catunaregam spinosa	D1	1	0.03	-0.01	+0.05
Ziziphus mucronata	D0.5	1	0.03	-0.01	+0.05
Dombeya rotundifolia var. rotundifolia	D1	1	0.03	-0.01	+0.05
Gymnosporia buxifolia	D1	1	0.03	-0.01	+0.05
Gymnosporia buxifolia	D0.5	1	0	-0.01	+0.02
Weak competitors:					
Dalbergia melanoxylon	D1	3	0.1	0.42	-0.32
Dalbergia melanoxylon	D0.5	3	0.1	0.42	-0.32
Total cover for species in group:			7.67		
Growth Form					
Tree			12.16		
Shrub			12.39		
Dwarf Shrub			7.67		
Total class cover			32.21		
Dwarf shrub proportion			23.81		
Shrub proportion			38.45		
Tree proportion			37.74		

August Triennial Burn

Trees

Correlation coefficient = + 0.73
Standard error of the mean = 0.88

	Height class	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	T	3	4.87	2.47	+2.41
Normal competition range:					
Dichrostachys cinerea	T	3	2.42	2.47	-0.05
Sclerocarya birrea subsp. caffra	T	2	0.97	1.19	-0.22
Grewia bicolor	T	1	0.54	-0.09	+0.62
Euclea natalensis subsp. angustifolia	T	1	0.3	-0.09	+0.39
Euclea divinorum	T	1	0.3	-0.09	+0.39
Philenoptera violacea	T	1	0.13	-0.09	+0.22
Gymnosporia senegalensis	T	1	0.03	-0.09	+0.12
Ehretia amoena	T	1	0.03	-0.09	+0.12
Combretum collinum subsp. gazense	T	1	0.03	-0.09	+0.12
Piliostigma thonningii	T	1	0.03	-0.09	+0.12
Strychnos madagascariensis	T	1	0.03	-0.09	+0.12
Diospyros lycioides subsp. sericea	T	1	0.03	-0.09	+0.12

Weak competitors:

Antidesma venosum	T	2	0.07	1.19	-1.12
Searsia pyroides var. pyroides	T	2	0.07	1.19	-1.13
Gymnosporia buxifolia	T	2	0.07	1.19	-1.14
Diospyros mespiliformis	T	2	0.07	1.19	-1.15

Total cover for species in group: 10.01

Shrubs

Correlation coefficient = + 0.73
Standard error of the mean = 0.57

	Height class	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	S1.5	3	2.89	1.7	+1.19
Dichrostachys cinerea	S1.5	3	2.59	1.7	+0.88
Dichrostachys cinerea	S2	3	2.59	1.7	+0.88
Euclea natalensis subsp. angustifolia	S1.5	1	1.21	0.05	+1.16
Terminalia sericea	S2	1	0.84	0.05	+0.79
Normal competition range:					
Parinari curatellifolia	S1.5	1	0.13	0.05	0.08
Ximenia caffra	S1.5	1	0.03	0.05	-0.02
Pappea capensis	S1.5	1	0.03	0.05	-0.02
Gymnosporia senegalensis	S2	1	0.03	0.05	-0.02
Combretum molle	S2	1	0.03	0.05	-0.02
Antidesma venosum	S1.5	1	0.03	0.05	-0.02
Peltophorum africanum	S2	1	0.03	0.05	-0.02
Sclerocarya birrea subsp. caffra	S1.5	1	0.03	0.05	-0.02
Piliostigma thonningii	S2	1	0.03	0.05	-0.02
Gymnosporia buxifolia	S1.5	1	0.03	0.05	-0.02
Albizia versicolor	S2	1	0.03	0.05	-0.02
Albizia versicolor	S1.5	1	0.03	0.05	-0.02
Rhoicissus tridentata subsp. cuneifolia	S1.5	1	0.03	0.05	-0.02
Piliostigma thonningii	S1.5	1	0.03	0.05	-0.02
Annona senegalensis subsp. senegalensis	S2	1	0.03	0.05	-0.02
Euclea divinorum	S2	1	0.03	0.05	-0.02
Combretum zeyheri	S2	1	0.03	0.05	-0.02
Combretum collinum subsp. gazense	S2	1	0.03	0.05	-0.02
Vachellia gerrardii	S1.5	1	0	0.05	-0.05
Philenoptera violacea	S1.5	1	0	0.05	-0.05
Vachellia exuvialis	S1.5	1	0	0.05	-0.05
Weak competitors:					
Searsia gueinzii	S2	2	0.07	0.88	-0.81
Combretum collinum subsp. gazense	S1.5	2	0.07	0.88	-0.81
Searsia pyroides var. pyroides	S1.5	2	0.07	0.88	-0.81
Searsia gueinzii	S1.5	2	0.07	0.88	-0.81
Euclea divinorum	S1.5	3	0.37	1.7	-1.33

Total cover for species in group: 11.46

Dwarf Shrubs

Correlation coefficient = +0.77
Standard error of the mean = 0.34

	Height class	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Dichrostachys cinerea	D1	3	2.99	1.31	+1.68
Cassia abbreviata subsp. beareana	D0.5	1	0.54	0.01	+0.53
Normal competition range:					
Terminalia sericea	D1	3	1.45	1.31	+0.14
Cassia abbreviata subsp. Beareana	D1	2	0.57	0.66	-0.09
Euclea natalensis subsp. angustifolia	D1	1	0.3	0.01	+0.29
Philenoptera violacea	D1	1	0.13	0.01	+0.12
Dichrostachys cinerea	D0.5	3	1.38	1.31	+0.07
Parinari curatellifolia	D1	1	0.13	0.01	+0.12
Terminalia sericea	D0.5	3	1.28	1.31	-0.03
Searsia lancea	D1	1	0.03	0.01	+0.02
Grewia bicolor	D0.5	2	0.57	0.66	-0.09
Pappea capensis	D0.5	1	0.03	0.01	+0.02
Gymnosporia senegalensis	D1	1	0.03	0.01	+0.02
Combretum collinum subsp. gazense	D1	1	0.03	0.01	+0.02
Grewia flavescens	D1	1	0.03	0.01	+0.02
Ziziphus mucronata	D1	1	0.03	0.01	+0.02
Gymnosporia senegalensis	D0.5	1	0.03	0.01	+0.02
Ehretia amoena	D1	1	0.03	0.01	+0.02
Searsia pyroides var. pyroides	D0.5	1	0.03	0.01	+0.02
Peltophorum africanum	D1	1	0.03	0.01	+0.02
Ehretia amoena	D0.5	1	0.03	0.01	+0.02
Solanum panduriforme	D1	1	0.03	0.01	+0.02
Dombeya rotundifolia var. rotundifolia	D1	1	0.03	0.01	+0.02
Ziziphus mucronata	D0.5	1	0.03	0.01	+0.02
Combretum molle	D1	1	0.03	0.01	+0.02
Gymnosporia buxifolia	D1	1	0.03	0.01	+0.02
Solanum panduriforme	D0.5	1	0.03	0.01	+0.02
Flueggea virosa subsp. virosa	D1	1	0.03	0.01	+0.02
Antidesma venosum	D0.5	1	0.03	0.01	+0.02
Flueggea virosa subsp. virosa	D0.5	1	0.03	0.01	+0.02
Dalbergia melanoxylon	D0.5	1	0.03	0.01	+0.02
Combretum molle	D0.5	1	0.03	0.01	+0.02
Solanum lichtensteinii	D0.5	1	0.03	0.01	+0.02
Rhoicissus tridentata subsp. cuneifolia	D0.5	1	0.03	0.01	+0.02
Philenoptera violacea	D0.5	1	0.03	0.01	+0.02
Diospyros mespiliformis	D1	1	0.03	0.01	+0.02
Pavetta schumanniana	D0.5	1	0.03	0.01	+0.02
Annona senegalensis subsp. senegalensis	D1	1	0.03	0.01	+0.02
Grewia bicolor	D1	1	0.03	0.01	+0.02
Euclea divinorum	D1	1	0.03	0.01	+0.02
Diospyros lycioides subsp. sericea	D1	1	0.03	0.01	+0.02

Annona senegalensis subsp. senegalensis	D0.5	1	0.03	0.01	+0.02
Grewia flavescens	D0.5	1	0.03	0.01	+0.02
Catunaregam spinosa	D1	1	0.03	0.01	+0.02

Weak competitors:

Piliostigma thonningii	D1	2	0.07	0.66	-0.59
Strychnos madagascariensis	D0.5	2	0.07	0.66	-0.60
Sclerocarya birrea subsp. caffra	D0.5	2	0.07	0.66	-0.61
Sclerocarya birrea subsp. caffra	D1	2	0.07	0.66	-0.62
Gymnosporia buxifolia	D0.5	2	0.07	0.66	-0.63
Antidesma venosum	D1	2	0.07	0.66	-0.64

Total cover for species in group: 10.87

Community Structure

Growth Form	
Tree	10.01
Shrub	11.46
Dwarf shrub	10.87
Total class cover	32.34
Dwarf shrub proportion	33.62
Shrub proportion	35.44
Tree proportion	30.95

August Annual Burn

Trees

Correlation coefficient = +0.94
Standard error of the mean = 0.65

	Height class	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	T	3	4.2	3.29	+0.91
Normal competition range:					
Ximenia caffra	T	1	0.03	-0.10	+0.13
Combretum hereroense	T	1	0.03	-0.10	+0.13
Antidesma venosum	T	1	0.03	-0.10	+0.13
Searsia pyroides var. pyroides	T	1	0.03	-0.10	+0.13
Dichrostachys cinerea	T	3	2.89	3.29	-0.4
Weak competitors:					
Sclerocarya birrea subsp. Caffra	T	2	0.57	1.6	-1.03

Total cover for species in group: 7.79

Shrubs

Correlation coefficient = +0.91
Standard error of the mean = 0.44

	Height class	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	S2	3	3.29	2.46	+0.83
Terminalia sericea	S1.5	3	3.29	2.46	+0.83
Normal competition range:					
Ximenia caffra	S2	1	0.03	-0.03	+0.06
Ximenia caffra	S1.5	1	0.03	-0.03	+0.06
Sclerocarya birrea subsp. caffra	S1.5	1	0.03	-0.03	+0.06
Philenoptera violacea	S1.5	1	0.03	-0.03	+0.06
Cassia abbreviata subsp. beareana	S2	1	0.03	-0.03	+0.06
Combretum molle	S1.5	1	0.03	-0.03	+0.06
Sclerocarya birrea subsp. caffra	S2	1	0.03	-0.03	+0.06
Pavetta schumanniana	S1.5	1	0.03	-0.03	+0.06
Dalbergia melanoxylon	S1.5	1	0.03	-0.03	+0.06
Catunaregam spinosa	S1.5	1	0.03	-0.03	+0.06
Cassia abbreviata subsp. beareana	S1.5	1	0.03	-0.03	+0.06
Diospyros mespiliformis	S2	1	0.03	-0.03	+0.06
Combretum hereroense	S1.5	1	0.03	-0.03	+0.06
Searsia gueinzii	S1.5	1	0.03	-0.03	+0.06
Albizia versicolor	S1.5	1	0.03	-0.03	+0.06
Rhoicissus tridentata subsp. cuneifolia	S1.5	1	0.03	-0.03	+0.06
Euclea divinorum	S1.5	1	0.03	-0.03	+0.06
Combretum collinum subsp. gazense	S2	1	0.03	-0.03	+0.06
Dichrostachys cinerea	S2	3	2.35	2.46	-0.11
Dichrostachys cinerea	S1.5	3	2.05	2.46	-0.41
Weak competitors:					
Grewia bicolor	S1.5	2	0.07	1.21	-1.15
Gymnosporia buxifolia	S1.5	2	0.07	1.21	-1.15
Total cover for species in group:			11.72		

Dwarf Shrubs

Correlation coefficient = +0.58
Standard error of the mean = 0.50

	Height class	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Dichrostachys cinerea	D1	3	2.59	0.91	+1.67
Dichrostachys cinerea	D0.5	3	2.59	0.91	+1.68
Terminalia sericea	D0.5	3	1.68	0.91	+0.77
Terminalia sericea	D1	3	1.51	0.91	+0.6
Combretum collinum subsp. gazense	D0.5	1	0.54	-0.04	+0.58

Normal competition range:

Cassia abbreviata subsp. beareana	D1	2	0.44	0.44	-0
Ximenia caffra	D0.5	1	0.03	-0.04	+0.07
Pavetta schumanniana	D1	2	0.17	0.44	0.27
Searsia gueinzii	D0.5	1	0.03	-0.04	+0.07
Solanum panduriforme	D1	1	0.13	-0.04	+0.17
Ehretia amoena	D1	2	0.07	0.44	0.37
Gymnosporia buxifolia	D1	2	0.07	0.44	0.37
Ziziphus mucronata	D0.5	1	0.03	-0.04	+0.07
Sclerocarya birrea subsp. caffra	D1	2	0.07	0.44	0.37
Euclea divinorum	D1	2	0.07	0.44	0.37
Combretum hereroense	D1	2	0.04	0.44	0.4
Ximenia caffra	D1	1	0.03	-0.04	+0.07
Lantana camara	D1	1	0.03	-0.04	+0.07
Parinari curatellifolia	D0.5	1	0.03	-0.04	+0.07
Diospyros mespiliformis	D0.5	1	0.03	-0.04	+0.07
Dalbergia melanoxylon	D0.5	1	0.03	-0.04	+0.07
Solanum lichtensteinii	D0.5	1	0.03	-0.04	+0.07
Rhoicissus tridentata subsp. cuneifolia	D0.5	1	0.03	-0.04	+0.07

Annona senegalensis subsp. senegalensis	D0.5	1	0.03	-0.04	+0.07
Ziziphus mucronata	D1	1	0.03	-0.04	+0.07
Grewia bicolor	D0.5	1	0.03	-0.04	+0.07
Philenoptera violacea	D1	1	0.03	-0.04	+0.07
Dombeya rotundifolia var. rotundifolia	D1	1	0.03	-0.04	+0.07
Cassia abbreviata subsp. beareana	D0.5	2	0.44	0.44	-0
Solanum panduriforme	D0.5	2	0.17	0.44	0.27
Combretum molle	D1	1	0.03	-0.04	+0.07
Pavetta schumanniana	D0.5	2	0.17	0.44	0.27
Strychnos madagascariensis	D1	1	0.03	-0.04	+0.07
Ehretia amoena	D0.5	2	0.07	0.44	0.37
Diospyros mespiliformis	D1	1	0.03	-0.04	+0.07
Euclea divinorum	D0.5	2	0.07	0.44	0.37
Combretum molle	D0.5	2	0.07	0.44	0.37
Catunaregam spinosa	D0.5	2	0.07	0.44	0.37
Albizia versicolor	D1	1	0.03	-0.04	+0.07
Philenoptera violacea	D0.5	2	0.07	0.44	0.37

Annona senegalensis subsp. senegalensis	D1	1	0.03	-0.04	+0.07
Catunaregam spinosa	D1	1	0.03	-0.04	+0.07

Weak competitors:

Strychnos madagascariensis	D0.5	3	0.1	0.91	-0.81
Sclerocarya birrea subsp. caffra	D0.5	3	0.1	0.91	-0.81
Gymnosporia buxifolia	D0.5	3	0.1	0.91	-0.81

Total cover for species in group: 12.04

Community Structure

Growth Form	
Tree	7.79
Shrub	11.72
Dwarf shrub	12.04

Total class cover	31.56
Dwarf shrub proportion	38.16
Shrub proportion	37.15
Tree proportion	24.69

ANNEXURE F: Community composition analysis grouped according to growth forms for the Skukuza Experimental Burn Plot

No Burn Treatment

Trees

Correlation coefficient=+0.21
Standard error of the mean= 0.52

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Euclea divinorum	T	1	2.15	0.22	+1.93
Combretum apiculatum subsp. apiculatum	T	2	1.38	0.44	+0.93
Terminalia sericea	T	2	1.07	0.44	+0.63
Normal competition range:					
Dalbergia melanoxylon	T	1	0.54	0.22	+0.32
Combretum collinum subsp. gazense	T	2	0.67	0.44	+0.23
Combretum hereroense	T	1	0.3	0.22	+0.09
Pterocarpus rotunidifolius subsp. rotunidifolius	T	1	0.13	0.22	-0.08
Vachellia exuvialis	T	1	0.13	0.22	-0.08
Ozoroa sphaerocarpa	T	1	0.03	0.22	-0.18
Manilkara mochisia	T	1	0.03	0.22	-0.18
Lannea schweinfurthii	T	1	0.03	0.22	-0.18
Capparis tomentosa	T	1	0.03	0.22	-0.18
Senegalia nigrescens	T	1	0.03	0.22	-0.18
Combretum zeyheri	T	1	0.03	0.22	-0.18
Pappea capensis	T	1	0.03	0.22	-0.18
Euclea natalensis subsp. angustifolia	T	1	0.03	0.22	-0.18
Philenoptera violacea	T	1	0.03	0.22	-0.18
Peltophorum africanum	T	1	0.03	0.22	-0.18
Albizia harveyi	T	1	0.03	0.22	-0.18
Gymnosporia buxifolia	T	1	0.03	0.22	-0.18
Grewia flavescens	T	2	0.17	0.44	-0.28
Ziziphus mucronata	T	2	0.07	0.44	-0.38
Vachellia gerrardii	T	2	0.07	0.44	-0.38
Sclerocarya birrea subsp. caffra	T	2	0.07	0.44	-0.38
Dichrostachys cinerea	T	2	0.07	0.44	-0.38
Total cover for species in group:			7.21		

Shrubs

Correlation coefficient=+0.19
Standard error of the mean= 0.37

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					

Combretum apiculatum subsp. apiculatum	S1.5	2	1.38	0.33	+1.04
Euclea divinorum	S2	1	1.21	0.21	+1
Combretum apiculatum subsp. apiculatum	S2	1	0.84	0.21	+0.63

Normal competition range:

Terminalia sericea	S2	1	0.54	0.21	+0.33
Vachellia exuvialis	S1.5	2	0.44	0.33	+0.10
Combretum hereroense	S1.5	3	0.37	0.46	-0.09
Pterocarpus rotunidifolius subsp. rotunidifolius	S2	2	0.17	0.33	-0.17
Vachellia gerrardii	S2	1	0.13	0.21	-0.08
Vachellia exuvialis	S2	1	0.13	0.21	-0.08
Dichrostachys cinerea	S1.5	1	0.3	0.21	+0.09
Dichrostachys cinerea	S2	1	0.13	0.21	-0.08
Grewia flavescens	S1.5	1	0.13	0.21	-0.08
Senegalia nigrescens	S2	1	0.13	0.21	-0.08
Gardenia volkensii subsp. volkensii	S1.5	2	0.07	0.33	-0.27
Pterocarpus rotunidifolius subsp. rotunidifolius	S1.5	2	0.07	0.33	-0.27
Ormocarpum trichocarpum	S2	2	0.07	0.33	-0.27
Ormocarpum trichocarpum	S1.5	1	0.03	0.21	-0.18
Combretum zeyheri	S1.5	1	0.03	0.21	-0.18
Cissus cornifolia	S1.5	1	0.03	0.21	-0.18
Albizia harveyi	S2	1	0.03	0.21	-0.18
Dalbergia melanoxylon	S2	1	0.03	0.21	-0.18
Sclerocarya birrea subsp. caffra	S1.5	1	0.03	0.21	-0.18
Searsia gueinzii	S2	1	0.03	0.21	-0.18
Flueggea virosa subsp. virosa	S1.5	1	0.03	0.21	-0.18
Dalbergia melanoxylon	S1.5	1	0.03	0.21	-0.18
Combretum zeyheri	S2	1	0.03	0.21	-0.18

Total cover for species in group: 6.44

Dwarf Shrubs

Correlation coefficient=+0.61
Standard error of the mean= 0.07

	Height class code	(F)	Actual Cover	Pred. cover	Difference

Strong competitors:

Terminalia sericea	D1	3	0.47	0.21	+0.26
Dalbergia melanoxylon	D1	2	0.34	0.13	+0.21
Strychnos madagascariensis	D1	1	0.13	0.05	+0.09
Strychnos madagascariensis	D0.5	1	0.13	0.05	+0.09
Solanum lichtensteinii	D0.5	1	0.13	0.05	+0.09
Sclerocarya birrea subsp. caffra	D0.5	1	0.13	0.05	+0.09
Euclea divinorum	D1	1	0.13	0.05	+0.09
Dichrostachys cinerea	D1	1	0.13	0.05	+0.09

Normal competition range:

Vachellia exuvialis	D1	2	0.17	0.13	+0.04
Combretum apiculatum subsp. Apiculatum	D1	3	0.2	0.21	-0.01
Vachellia exuvialis	D0.5	3	0.2	0.21	-0.01
Dichrostachys cinerea	D0.5	3	0.2	0.21	-0.01
Combretum zeyheri	D1	1	0.03	0.05	-0.01

Senegalia nigrescens	D1	1	0.03	0.05	-0.01
Pterocarpus rotunidifolius subsp. rotunidifolius	D1	1	0.03	0.05	-0.01
Solanum lichtensteinii	D1	1	0.03	0.05	-0.01
Aspargus setaceus	D0.5	1	0.03	0.05	-0.01
Combretum zeyheri	D0.5	1	0.03	0.05	-0.01
Ehretia rigida subsp. nervifolia	D1	1	0.03	0.05	-0.01
Combretum hereroense	D0.5	1	0.03	0.05	-0.01
Capparis tomentosa	D1	1	0.03	0.05	-0.01
Vachellia gerrardii	D0.5	1	0.03	0.05	-0.01
Senegalia nigrescens	D0.5	1	0.03	0.05	-0.01
Diospyros lycioides subsp. sericea	D0.5	1	0.03	0.05	-0.01
Combretum collinum subsp. gazense	D1	1	0.03	0.05	-0.01
Ehretia amoena	D1	1	0.03	0.05	-0.01
Ziziphus mucronata	D0.5	1	0.03	0.05	-0.01
Solanum panduriforme	D0.5	1	0.03	0.05	-0.01
Gymnosporia buxifolia	D1	1	0.03	0.05	-0.01
Flueggea virosa subsp. virosa	D1	1	0.03	0.05	-0.01
Combretum collinum subsp. gazense	D0.5	1	0.03	0.05	-0.01
Pavetta schumanniana	D0.5	1	0.03	0.05	-0.01
Grewia flavescens	D0.5	1	0.03	0.05	-0.01
Cissus cornifolia	D0.5	2	0.07	0.13	-0.06
Commiphora edulis subsp. edulis	D1	2	0.07	0.13	-0.06
Ormocarpum trichocarpum	D1	2	0.07	0.13	-0.06
Ormocarpum trichocarpum	D0.5	2	0.07	0.13	-0.06
Cissus cornifolia	D1	2	0.07	0.13	-0.06
Albizia harveyi	D1	2	0.07	0.13	-0.06
Grewia flavescens	D1	2	0.07	0.13	-0.06
Dalbergia melanoxylon	D0.5	2	0.07	0.13	-0.06
Combretum hereroense	D1	2	0.07	0.13	-0.06
Terminalia sericea	D0.5	2	0.07	0.13	-0.06
Sclerocarya birrea subsp. caffra	D1	2	0.07	0.13	-0.06
Grewia bicolor	D1	2	0.07	0.13	-0.06

Total cover for species in group: 3.87

Community Structure

Growth Form

Tree	7.21
Shrub	6.44
Dwarf Shrub	3.87

Total class cover 17.52

Dwarf shrub proportion	22.1
Shrub proportion	36.75
Tree proportion	41.15

February Triennial Burn

Trees

Correlation coefficient=+0.21
Standard error of the mean= 0.52

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	T	3	3.12	1.28	+1.84
Combretum apiculatum subsp. apiculatum	T	3	2.22	1.25	+0.94
Normal competition range:					
Spirostachys africana	T	1	0.54	0.06	+0.48
Peltophorum africanum	T	1	0.54	0.06	+0.48
Gymnosporia buxifolia	T	1	0.13	0.06	+0.08
Pavetta schumanniana	T	1	0.03	0.06	+0.02
Ekebergia capensis	T	1	0.03	0.06	+0.02
Ziziphus mucronata	T	1	0.03	0.06	+0.02
Lannea schweinfurthii	T	1	0.03	0.06	+0.02
Flueggea virosa subsp. virosa	T	1	0.03	0.06	+0.02
Senegalia nigrescens	T	1	0.03	0.06	+0.02
Vachellia exuvialis	T	1	0.03	0.06	+0.02
Ehretia amoena	T	1	0.03	0.06	+0.02
Boscia albitrunca	T	1	0.03	0.06	+0.02
Philenoptera violacea	T	1	0.03	0.06	+0.02
Euclea divinorum	T	1	0.03	0.06	+0.02
Combretum hereroense	T	1	0.03	0.06	+0.02
Strychnos madagascariensis	T	1	0.03	0.06	+0.02
Diospyros lycioides subsp. sericea	T	1	0.03	0.06	+0.02
Dichrostachys cinerea	T	3	0.97	1.28	-0.31
Sclerocarya birrea subsp. caffra	T	2	0.34	0.67	-0.33
Cissus cornifolia	T	2	0.17	0.67	-0.50
Weak competitors:					
Pterocarpus rotunidifolius subsp. rotunidifolius	T	2	0.07	0.67	-0.60
Combretum collinum subsp. gazense	T	3	0.6	1.28	-0.68
Combretum zeyheri	T	3	0.2	1.28	-1.08
Total cover for species in group:			9.36		

Shrubs

Correlation coefficient=+0.77
Standard error of the mean= 0.12

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Dichrostachys cinerea	S2	2	0.67	0.3	+0.37
Dichrostachys cinerea	S1.5	3	0.8	0.54	+0.26
Spirostachys africana	S2	1	0.3	0.06	+0.24
Ximenia caffra	S2	1	0.3	0.06	+0.24
Normal competition range:					
Grewia flavescens	S1.5	3	0.6	0.54	+0.06
Vachellia exuvialis	S1.5	2	0.27	0.3	-0.04

Combretum zeyheri	S2	2	0.27	0.3	-0.04
Combretum collinum subsp. gazense	S2	1	0.13	0.06	+0.07
Terminalia sericea	S1.5	1	0.13	0.06	+0.07
Jasminum fluminense	S1.5	1	0.13	0.06	+0.07
Commiphora edulis subsp. edulis	S1.5	1	0.03	0.06	-0.03
Ozoroa sphaerocarpa	S1.5	1	0.03	0.06	-0.03
Ochna natalitia	S1.5	1	0.03	0.06	-0.03
Flueggea virosa subsp. virosa	S2	1	0.13	0.06	+0.07
Pterocarpus rotunidifolius subsp. rotunidifolius	S1.5	1	0.03	0.06	-0.03
Pterocarpus rotunidifolius subsp. rotunidifolius	S2	1	0.03	0.06	-0.03
Lannea schweinfurthii	S1.5	1	0.03	0.06	-0.03
Vachellia exuvialis	S2	1	0.03	0.06	-0.03
Cissus cornifolia	S1.5	1	0.03	0.06	-0.03
Albizia harvey	S2	1	0.03	0.06	-0.03
Euclea natalensis subsp. angustifolia	S2	1	0.03	0.06	-0.03
Ziziphus mucronata	S1.5	1	0.03	0.06	-0.03
Ziziphus mucronata	S2	1	0.03	0.06	-0.03
Grewia bicolor	S1.5	1	0.03	0.06	-0.03
Searsia gueinzii	S2	1	0.03	0.06	-0.03
Gymnosporia buxifolia	S2	1	0.03	0.06	-0.03
Combretum molle	S1.5	1	0.03	0.06	-0.03
Sclerocarya birrea subsp. caffra	S2	1	0.03	0.06	-0.03
Mundulea sericea subsp. sericea	S2	1	0.03	0.06	-0.03
Mundulea sericea subsp. sericea	S1.5	1	0.03	0.06	-0.03
Gymnosporia buxifolia	S1.5	1	0.03	0.06	-0.03
Dalbergia melanoxylon	S1.5	1	0.03	0.06	-0.03
Catunaregam spinosa	S1.5	1	0.03	0.06	-0.03
Euclea divinorum	S1.5	1	0.03	0.06	-0.03
Combretum apiculatum subsp. apiculatum	S1.5	1	0.03	0.06	-0.03
Combretum apiculatum subsp. apiculatum	S2	1	0.03	0.06	-0.03
Sclerocarya birrea subsp. caffra	S1.5	1	0	0.06	-0.06
Weak competitors:					
Strychnos madagascariensis	S1.5	2	0.07	0.3	-0.24
Combretum collinum subsp. gazense	S1.5	3	0.2	0.54	-0.34
Total cover for species in group:			4.85		

Dwarf Shrubs

Correlation coefficient=+0.55
Standard error of the mean= 0.12

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	D0.5	1	0.54	0.05	+0.48
Terminalia sericea	D1	3	0.7	0.27	+0.43
Dichrostachys cinerea	D1	3	0.4	0.27	+0.13
Normal competition range:					
Combretum apiculatum subsp. apiculatum	D1	2	0.27	0.16	+0.10
Grewia flavescens	D0.5	2	0.27	0.16	+0.10
Combretum collinum subsp. gazense	D1	2	0.17	0.16	+0

Dichrostachys cinerea	D0.5	3	0.2	0.27	-0.07
Combretum apiculatum subsp. apiculatum	D0.5	2	0.17	0.16	+0
Vachellia exuvialis	D1	2	0.17	0.16	+0
Sclerocarya birrea subsp. caffra	D1	1	0.13	0.05	+0.08
Ochna natalitia	D0.5	1	0.13	0.05	+0.08
Solanum lichtensteinii	D1	2	0.07	0.16	-0.10
Rhoicissus tridentata subsp. cuneifolia		1	0.03	0.05	-0.02
Vachellia gerrardii	D1	2	0.07	0.16	-0.10
Lannea schweinfurthii	D1	1	0.03	0.05	-0.02
Lannea schweinfurthii	D0.5	2	0.07	0.16	-0.10
Lannea discolor	D1	1	0.03	0.05	-0.02
Ormocarpum trichocarpum	D1	1	0.03	0.05	-0.02
Ormocarpum trichocarpum	D0.5	2	0.07	0.16	-0.10
Senegalia nigrescens	D0.5	2	0.07	0.16	-0.10
Pappea capensis	D1	1	0.03	0.05	-0.02
Grewia flavescens	D1	1	0.03	0.05	-0.02
Ziziphus mucronata	D1	1	0.03	0.05	-0.02
Ehretia amoena	D1	1	0.03	0.05	-0.02
Ehretia amoena	D0.5	1	0.03	0.05	-0.02
Philenoptera violacea	D1	1	0.03	0.05	-0.02
Vachellia exuvialis	D0.5	1	0.03	0.05	-0.02
Strychnos madagascariensis	D1	1	0.03	0.05	-0.02
Gymnosporia buxifolia	D1	1	0.03	0.05	-0.02
Dalbergia melanoxylon	D1	1	0.03	0.05	-0.02
Pavetta schumanniana	D1	1	0.03	0.05	-0.02
Dalbergia melanoxylon	D0.5	1	0.03	0.05	-0.02
Combretum collinum subsp. gazense	D0.5	1	0.03	0.05	-0.02
Gymnosporia buxifolia	D0.5	1	0.03	0.05	-0.02
Catunaregam spinosa	D1	1	0.03	0.05	-0.02
Sclerocarya birrea subsp. caffra	D0.5	1	0.03	0.05	-0.02
Commiphora edulis subsp. edulis	D0.5	1	0.03	0.05	-0.02
Cissus cornifolia	D0.5	1	0.03	0.05	-0.02
Commiphora edulis subsp. edulis	D1	1	0.03	0.05	-0.02
Flueggea virosa subsp. virosa	D1	1	0.03	0.05	-0.02
Strychnos madagascariensis	D0.5	1	0.03	0.05	-0.02

Weak competitors:

Cissus cornifolia	D1	3	0.1	0.27	-0.17
Solanum lichtensteinii	D0.5	3	0.1	0.27	-0.17

Total cover for species in group: 4.54

Community Structure

Growth Form

Tree	9.36
Shrub	4.85
Dwarf Shrub	4.54
Total class cover	18.75
Dwarf shrub proportion	24.21
Shrub proportion	25.88
Tree proportion	49.91

August Triennial Burn

Trees

Correlation coefficient=+0.67
Standard error of the mean= 0.42

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia sericea	T	2	1.51	0.53	+0.98
Normal competition range:					
Combretum apiculatum subsp. apiculatum	T	3	1.28	1.06	+0.22
Strychnos madagascariensis	T	2	0.34	0.53	-0.19
Pterocarpus rotunidifolius subsp. rotunidifolius	T	2	0.17	0.53	-0.36
Cissus cornifolia	T	2	0.17	0.53	-0.37
Sclerocarya birrea subsp. caffra	T	1	0.13	0	+0.13
Philenoptera violacea	T	1	0.03	0	+0.03
Combretum zeyheri	T	1	0.03	0	+0.03
Combretum collinum subsp. gazense	T	1	0.03	0	+0.03
Dichrostachys cinerea	T	1	0	0	-0
Weak competitors:					
Vachellia exuvialis	T	2	0.04	0.53	-0.49
Total cover for species in group:			3.73		

Shrubs

Correlation coefficient=+0.46
Standard error of the mean= 0.14

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Combretum apiculatum subsp. apiculatum	S1.5	2	0.67	0.18	+0.49
Strychnos madagascariensis	S1.5	2	0.44	0.18	+0.25
Albizia harveyi	S1.5	1	0.3	0.06	+0.25
Normal competition range:					
Combretum apiculatum subsp. apiculatum	S2	2	0.27	0.18	+0.08
Strychnos madagascariensis	S2	2	0.27	0.18	+0.08
Catunaregam spinosa	S2	2	0.17	0.18	-0.02
Combretum collinum subsp. gazense	S1.5	2	0.17	0.18	-0.02
Combretum collinum subsp. gazense	S2	1	0.13	0.06	+0.08
Cissus cornifolia	S1.5	2	0.07	0.18	-0.12
Pterocarpus rotunidifolius subsp. rotunidifolius	S2	1	0.03	0.06	-0.02
Pterocarpus rotunidifolius subsp. rotunidifolius	S1.5	1	0.03	0.06	-0.02
Protorhus longifolia	S2	1	0.03	0.06	-0.02
Vachellia exuvialis	S2	1	0.03	0.06	-0.02

Combretum zeyheri	S2	1	0.03	0.06	-0.02
Dalbergia melanoxylon	S1.5	1	0.03	0.06	-0.02
Sclerocarya birrea subsp. caffra	S2	1	0.03	0.06	-0.02
Gymnosporia buxifolia	S1.5	1	0.03	0.06	-0.02
Catunaregam spinosa	S2	1	0.03	0.06	-0.02
Combretum zeyheri	S1.5	1	0.03	0.06	-0.02
Albizia harveyi	S2	1	0.03	0.06	-0.02
Ximenia caffra	S2	1	0	0.06	-0.05
Philenoptera violacea	S1.5	1	0	0.06	-0.05
Philenoptera violacea	S1.5	1	0	0.06	-0.05
Vachellia exuvialis	S2	1	0	0.06	-0.05
Dichrostachys cinerea	S1.5	1	0	0.06	-0.05
Dalbergia melanoxylon	S2	1	0	0.06	-0.05
Weak competitors:					
Cissus cornifolia	S1.5	2	0.04	0.18	-0.15
Dichrostachys cinerea	S1.5	2	0.04	0.18	-0.15
Lannea discolor	S1.5	3	0.07	0.31	-0.24
Total cover for species in group:			3.01		

Dwarf Shrubs

Correlation coefficient=+0.52
Standard error of the mean= 0.10

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Strychnos madagascariensis	D1	2	0.44	0.14	+0.30
Strychnos madagascariensis	D0.5	2	0.44	0.14	+0.30
Normal competition range:					
Terminalia sericea	D1	2	0.14	0.14	-0
Pterocarpus rotunidifolius subsp. rotunidifolius	D1	2	0.07	0.14	-0.07
Combretum apiculatum subsp. apiculatum	D1	1	0.03	0.04	-0
Cissus cornifolia	D1	1	0.03	0.04	-0
Vachellia exuvialis	D1	1	0.03	0.04	-0
Dalbergia melanoxylon	D1	1	0.03	0.04	-0
Albizia harveyi	D1	1	0.03	0.04	-0
Combretum collinum subsp. gazense	D1	1	0	0.04	-0.03
Weak competitors:					
Combretum apiculatum subsp. apiculatum	D0.5	2	0.04	0.14	-0.1
Sclerocarya birrea subsp. caffra	D1	2	0.04	0.14	-0.1
Dichrostachys cinerea	D0.5	3	0.1	0.24	-0.14
Total cover for species in group:			2.06		

Community Structure

Growth Form			3.73		
Tree			3.01		

Shrub	2.06
Dwarf shrub	
Total class cover	8.8
Dwarf shrub proportion	23.44
Shrub proportion	34.15
Tree proportion	42.41

August Annual Burn

Trees

Correlation coefficient=+0.84
Standard error of the mean= 0.19

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Sclerocarya birrea subsp. caffra	T	1	0.03	0.08	+0.22
Normal competition range:					
Combretum apiculatum subsp. apiculatum	T	3	0.97	0.45	+0.12
Combretum collinum subsp. gazense	T	2	0.57	0.45	+0.12
Pterocarpus rotunidifolius subsp. rotunidifolius	T	2	0.44	0.45	-0.02
Terminalia sericea	T	1	0.13	0.08	+0.05
Vachellia nilotica	T	1	0.03	0.08	0.05
Vachellia gerrardii	T	1	0.03	0.08	0.05
Vachellia exuvialis	T	1	0.03	0.08	0.05
Weak competitors:					
Dichrostachys cinerea	T	2	0.07	0.45	-0.39
Total cover for species in group:			2.58		

Shrubs

Correlation coefficient=+0.76
Standard error of the mean= 0.15

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Combretum apiculatum subsp. apiculatum	S1.5	2	0.67	0.37	+0.3
Combretum collinum subsp. gazense	S1.5	2	0.57	0.37	+0.2
Combretum collinum subsp. gazense	S2	2	0.57	0.37	+0.2
Normal competition range:					
Pterocarpus rotunidifolius subsp. rotunidifolius	S1.5	2	0.44	0.37	+0.06
Terminalia sericea	S1.5	1	0.13	0.04	+0.09

Peltophorum africanum	S1.5	1	0.03	0.04	-0.01
Vachellia nilotica	S2	1	0.03	0.04	-0.01
Vachellia gerrardii	S2	1	0.03	0.04	-0.01
Diospyros lycioides subsp. sericea	S1.5	1	0.03	0.04	-0.01
Vachellia gerrardii	S1.5	1	0.03	0.04	-0.01
Strychnos madagascariensis	S1.5	1	0.03	0.04	-0.01
Sclerocarya birrea subsp. caffra	S1.5	1	0.03	0.04	-0.01
Flueggea virosa subsp. virosa	S1.5	1	0.03	0.04	-0.01
Dalbergia melanoxylon	S1.5	1	0.03	0.04	-0.01
Dichrostachys cinerea	S1.5	1	0.03	0.04	-0.01
Terminalia sericea	S2	2	0.34	0.37	-0.04
Weak competitors:					
Pterocarpus rotunidifolius subsp. rotunidifolius	S2	2	0.17	0.37	-0.21
Combretum apiculatum subsp. apiculatum	S2	2	0.17	0.37	-0.21
Vachellia exuvialis	S2	2	0.07	0.37	-0.31
Total cover for species in group:			3.45		

Dwarf Shrubs

Correlation coefficient=+0.36
Standard error of the mean= 0.12

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Strychnos madagascariensis	D1	1	0.54	0.07	+0.47
Terminalia sericea	D1	2	0.44	0.15	+0.28
Combretum apiculatum subsp. apiculatum	D0.5	2	0.34	0.15	+0.18
Combretum collinum subsp. gazense	D1	2	0.34	0.15	+0.18
Normal competition range:					
Xerophyta retinervis D	D0.5	2	0.17	0.15	+0.01
Combretum apiculatum subsp. apiculatum	D1	2	0.17	0.15	+0.01
Vachellia exuvialis	D0.5	2	0.17	0.15	+0.01
Vachellia exuvialis	D1	2	0.17	0.15	+0.01
Strychnos madagascariensis	D0.5	1	0.13	0.07	+0.07
Sclerocarya birrea subsp. caffra	D1	2	0.17	0.15	+0.01
Schotia brachypetala	D0.5	2	0.07	0.15	-0.09
Lannea discolor	D1	1	0.03	0.07	-0.03
Cissus cornifolia	D0.5	2	0.07	0.15	-0.09
Ormocarpum trichocarpum	D1	1	0.03	0.07	-0.03
Vachellia gerrardii	D0.5	2	0.07	0.15	-0.09
Searsia gueinzii	D1	1	0.03	0.07	-0.03
Philenoptera violacea	D1	1	0.03	0.07	-0.03
Gymnosporia buxifolia	D1	1	0.03	0.07	-0.03
Dalbergia melanoxylon	D1	1	0.03	0.07	-0.03
Combretum collinum subsp. gazense	D0.5	2	0.07	0.15	-0.09
Catunaregam spinosa	D0.5	2	0.07	0.15	-0.09
Gymnosporia buxifolia	D0.5	1	0.03	0.07	-0.03
Grewia bicolor	D0.5	1	0.03	0.07	-0.03
Dichrostachys cinerea	D1	1	0.03	0.07	-0.03
Dichrostachys cinerea	D0.5	1	0.03	0.07	-0.03

Catunaregam spinosa	D1	1	0.03	0.07	-0.03
Ormocarpum trichocarpum	D0.5	1	0.03	0.07	-0.03
Cissus cornifolia	D1	2	0.07	0.15	-0.09
Ehretia amoena	D0.5	1	0.03	0.07	-0.03
Dalbergia melanoxylon	D0.5	1	0.03	0.07	-0.03
Sclerocarya birrea subsp. caffra	D0.5	1	0.03	0.07	-0.03
Pavetta schumanniana	D0.5	1	0.03	0.07	-0.03
Grewia bicolor	D1	2	0.07	0.15	-0.09

Total cover for species in group:	3.68

Community Structure

Growth Form	
Tree	2.58
Shrub	3.45
Dwarf shrub	3.68
Total class cover	9.71
Dwarf shrub proportion	37.89
Shrub proportion	35.52
Tree proportion	26.6

ANNEXURE G: Community composition analysis grouped according to growth forms for the Satara Experimental Burn Plot

No Burn treatment

Trees

Correlation coefficient=+0.64
Standard error of the mean= 0.06

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Combretum imberbe	T	2	0.27	0.16	+0.11
Normal competition range:					
Cassia abbreviata subsp. beareana	T	2	0.17	0.16	+0.01
Philenoptera violacea	T	3	0.17	0.23	-0.06
Diospyros lycioides subsp. sericea	T	1	0.13	0.08	+0.05
Commiphora africana var. africana	T	1	0.13	0.08	+0.05
Pergularia daemia subsp. daemia	T	1	0.13	0.08	+0.05
Combretum apiculatum subsp. apiculatum	T	1	0.03	0.08	-0.05
Peltophorum africanum	T	1	0.03	0.08	-0.05
Combretum hereroense	T	1	0.03	0.08	-0.05
Senegalia nigrescens	T	1	0.03	0.08	-0.05
Total cover for species in group:			1.14		

Shrubs

Correlation coefficient=+0.53
Standard error of the mean= 0.13

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Vachellia exuvialis	S2	1	0.54	0.08	+0.46
Normal competition range:					
Commiphora africana var. africana	S2	3	0.47	0.35	+0.12
Diospyros lycioides subsp. sericea	S1.5	2	0.17	0.21	-0.05
Diospyros lycioides subsp. sericea	S2	1	0.13	0.08	+0.06
Philenoptera violacea	S2	1	0.13	0.08	+0.06
Combretum imberbe	S2	1	0.03	0.08	-0.04
Ehretia amoena	S1.5	2	0.17	0.21	-0.05
Grewia flava	S2	1	0.03	0.08	-0.04
Grewia flava	S1.5	1	0.13	0.08	+0.06
Flueggea virosa subsp. virosa	S2	1	0.03	0.08	-0.04
Combretum apiculatum subsp. apiculatum	S2	1	0.03	0.08	-0.04
Philenoptera violacea	S1.5	1	0.03	0.08	-0.04

Grewia bicolor	S1.5	1	0.03	0.08	-0.04
Vachellia exuvialis	S1.5	1	0.03	0.08	-0.04
Cassia abbreviata subsp. beareana	S1.5	1	0.03	0.08	-0.04
Dichrostachys cinerea	S1.5	1	0.03	0.08	-0.04
Dichrostachys cinerea	S2	1	0.03	0.08	-0.04
Combretum imberbe	S1.5	1	0.03	0.08	-0.04
Commiphora africana var. africana	S1.5	1	0.03	0.08	-0.04
Weak competitors:					
Flueggea virosa subsp. virosa	S1.5	2	0.07	0.21	-0.15
Total cover for species in group:			2.21		

Dwarf Shrubs

Correlation coefficient=+0.71
Standard error of the mean= 0.03

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Ehretia amoena	D1	2	0.17	0.08	+0.09
Solanum panduriforme	D0.5	2	0.14	0.08	+0.06
Normal competition range:					
Combretum imberbe	D1	3	0.1	0.12	-0.02
Commiphora africana var. africana	D0.5	1	0.03	0.03	-0
Grewia flava	D1	2	0.07	0.08	-0.01
Commiphora africana var. africana	D1	2	0.07	0.08	-0.01
Senegalia nigrescens	D1	1	0.03	0.03	-0
Combretum apiculatum subsp. apiculatum	D1	1	0.03	0.03	-0
Senegalia nigrescens	D0.5	1	0.03	0.03	-0
Combretum collinum subsp. gazense	D1	1	0.03	0.03	-0
Ziziphus mucronata	D1	1	0.03	0.03	-0
Ziziphus mucronata	D0.5	1	0.03	0.03	-0
Vachellia exuvialis	D0.5	1	0.03	0.03	-0
Vachellia exuvialis	D1	1	0.03	0.03	-0
Sclerocarya birrea subsp. caffra	D1	1	0.03	0.03	-0
Grewia bicolor	D1	1	0.03	0.03	-0
Dichrostachys cinerea	D0.5	1	0.03	0.03	-0
Philenoptera violacea	D1	1	0.03	0.03	-0
Flueggea virosa subsp. virosa	D1	1	0.03	0.03	-0
Dichrostachys cinerea	D1	1	0.03	0.03	-0
Weak competitors:					
Aspargus setaceus	D0.5	1	0	0.03	-0.03
Gymnosporia buxifolia	D1	1	0	0.03	-0.03
Ehretia amoena	D0.5	3	0.07	0.12	-0.05
			1.11		
Total cover for species in group:					

Community Structure

Growth Form	
Tree	1.14
Shrub	2.21
Dwarf shrub	1.11
Total class cover	4.46
Dwarf shrub proportion	24.98
Shrub proportion	49.51
Tree proportion	25.5

February Triennial Burn

Trees

Correlation coefficient=+0.71
Standard error of the mean= 0.06

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Normal competition range:					
Philenoptera violacea	T	2	0.27	0.22	+0.05
Combretum imberbe	T	2	0.17	0.22	-0.05
Balanites maughamii	T	1	0.13	0.09	+0.05
Senegalia nigrescens	T	1	0.13	0.09	+0.05
Dichrostachys cinerea	T	1	0.13	0.09	+0.05
Commiphora africana var. africana	T	1	0.13	0.09	+0.05
Grewia flava	T	1	0.03	0.09	-0.05
Grewia bicolor	T	1	0.03	0.09	-0.05
Weak competitors:					
Sclerocarya birrea subsp. caffra	T	1	0	0.09	-0.08
Total cover for species in group:			1.04		

Shrubs

Correlation coefficient=+0.90
Standard error of the mean= 0.10

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Flueggea virosa subsp. virosa	S1.5	2	0.57	0.38	+0.19
Dichrostachys cinerea	S2	3	0.87	0.72	+0.15
Normal competition range:					
Combretum imberbe	S1.5	3	0.74	0.72	+0.02
Balanites maughamii	S1.5	1	0.13	0.04	+0.09

Flueggea virosa subsp. virosa	S2	1	0.13	0.04	+0.09
Philenoptera violacea	S2	1	0.13	0.04	+0.09
Dichrostachys cinerea	S1.5	1	0.13	0.04	+0.09
Capparis tomentosa	S1.5	1	0.03	0.04	-0.01
Pergularia daemia subsp. daemia	S1.5	1	0.03	0.04	-0.01
Maerua edulis	S1.5	1	0.03	0.04	-0.01
Aspargus setaceus	S1.5	1	0.03	0.04	-0.01
Ehretia amoena	S1.5	1	0.03	0.04	-0.01
Commiphora africana var. africana	S1.5	1	0.03	0.04	-0.01
Vachellia exuvialis	S2	1	0.03	0.04	-0.01
Cissus cornifolia	S1.5	1	0.03	0.04	-0.01
Cassia abbreviata subsp. beareana	S2	1	0.03	0.04	-0.01
Sclerocarya birrea subsp. caffra	S2	1	0.03	0.04	-0.01
Gymnosporia buxifolia	S1.5	1	0.03	0.04	-0.01
Cassia abbreviata subsp. beareana	S1.5	1	0.03	0.04	-0.01
Euclea divinorum	S1.5	1	0.03	0.04	-0.01
Ziziphus mucronata	S1.5	1	0.03	0.04	-0.01
Peltophorum africanum	S2	1	0.03	0.04	-0.01
Weak competitors:					
Philenoptera violacea	S1.5	2	0.17	0.38	-0.22
Grewia flava	S1.5	2	0.07	0.38	-0.32
Total cover for species in group:			3.39		

Dwarf Shrubs

Correlation coefficient=+0.33
Standard error of the mean= 0.12

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Maerua edulis	D1	1	0.54	0.06	+0.47
Solanum panduriforme	D1	3	0.03	0.18	+0.12
Normal competition range:					
Maerua edulis	D0.5	1	0.13	0.06	+0.07
Grewia flava	D1	3	0.2	0.18	+0.02
Dichrostachys cinerea	D1	2	0.17	0.12	+0.04
Combretum imberbe	D0.5	2	0.07	0.12	-0.06
Commiphora africana var. africana	D1	2	0.07	0.12	-0.06
Senegalia nigrescens	D0.5	2	0.04	0.12	-0.09
Philenoptera violacea	D1	2	0.07	0.12	-0.06
Solanum panduriforme	D0.5	1	0.03	0.06	-0.03
Vachellia exuvialis	D0.5	1	0.03	0.06	-0.03
Vachellia exuvialis	D1	2	0.07	0.12	-0.06
Flueggea virosa subsp. virosa	D1	1	0.03	0.06	-0.03
Euclea natalensis subsp. angustifolia	D1	1	0.03	0.06	-0.03
Dalbergia melanoxylon	D0.5	1	0.03	0.06	-0.03
Grewia bicolor	D1	1	0.03	0.06	-0.03
Dichrostachys cinerea	D0.5	1	0.03	0.06	-0.03
Senegalia nigrescens	D1	1	0.03	0.06	-0.03
Ehretia amoena	D1	1	0.03	0.06	-0.03

Flueggea virosa subsp. virosa	D0.5	1	0.03	0.06	-0.03
Sclerocarya birrea subsp. caffra	D1	1	0.03	0.06	-0.03
Euclea divinorum	D0.5	1	0.03	0.06	-0.03
Sclerocarya birrea subsp. caffra	D0.5	1	0	0.06	-0.06

Total cover for species in group: 2.04

Community Structure

Growth Form

Tree	1.04
Shrub	3.39
Dwarf Shrub	2.04
Total class cover	6.47
Dwarf shrub proportion	31.58
Shrub proportion	52.4
Tree proportion	16.02

August Triennial Burn

Trees

Correlation coefficient=+0,93
Standard error of the mean= 0,17

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Normal competition range:					
Senegalia nigrescens	T	3	1.28	1.12	+0.15
Vachellia exuvialis	T	2	0.67	0.57	+0.10
Combretum imberbe	T	1	0.13	0.02	+0.11
Vachellia tortilis subsp. heteracantha	T	1	0.03	0.02	+0.01
Cassia abbreviata subsp. beareana	T	1	0.03	0.02	+0.02
Searsia pyroides var. pyroides	T	1	0.03	0.02	+0.03
Dichrostachys cinerea	T	1	0.03	0.02	+0.04
Gymnosporia buxifolia	T	1	0	0.02	-0.02
Weak competitors:					
Combretum hereroense	T	2	0.17	0.57	-0.40

Total cover for species in group: 2.38

Shrubs

Correlation coefficient=+0.95
Standard error of the mean= 0.06

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					

Combretum imberbe	S2	1	0.13	0.08	+0.06
Ehretia amoena	S1.5	1	0.13	0.08	+0.06
Commiphora africana var. africana	S2	1	0.13	0.08	+0.06
Commiphora africana var. africana	S1.5	1	0.13	0.08	+0.06
Dichrostachys cinerea	S2	1	0.13	0.08	+0.06

Normal competition range:

Dichrostachys cinerea	S1.5	2	0.61	0.61	+0
Grewia flava	S1.5	1	0.03	0.08	-0.04
Senegalia nigrescens	S2	1	0.03	0.08	-0.04
Vachellia exuvialis	S2	1	0.03	0.08	-0.04
Grewia bicolor	S1.5	1	0.03	0.08	-0.04
Vachellia exuvialis	S1.5	1	0.03	0.08	-0.04

Weak competitors:

Grewia flavescens	S1.5	1	0	0.08	-0.07

Total cover for species in group: 1.44

Dwarf Shrubs

Correlation coefficient=+0.65
Standard error of the mean= 0.10

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Dichrostachys cinerea	D0.5	2	0.44	0.16	+0.28
Solanum panduriforme	D1	2	0.27	0.16	+0.11
Dichrostachys cinerea	D1	3	0.37	0.26	+0.11
Normal competition range:					
Flueggea virosa subsp. virosa	D1	3	0.2	0.26	-0.06
Commiphora africana var. africana	D1	2	0.17	0.16	+0.01
Senegalia nigrescens	D1	2	0.07	0.16	-0.09
Philenoptera violacea	D1	1	0.03	0.05	-0.02
Vachellia exuvialis	D1	1	0.03	0.05	-0.02
Sclerocarya birrea subsp. caffra	D1	1	0.03	0.05	-0.02
Aspargus setaceus	D1	1	0.03	0.05	-0.02
Ehretia amoena	D1	1	0.03	0.05	-0.02
Grewia flava	D1	1	0	0.05	-0.05
Weak competitors:					
Vachellia exuvialis	D0.5	3	0.1	0.26	-0.16

Total cover for species in group: 2.11

Community Structure

Growth Form

Tree	13.23
Shrub	1.44
Dwarf Shrub	2.11
Total class cover	16.79
Dwarf shrub proportion	12.57
Shrub proportion	8.6
Tree proportion	78.83

August Annual Burn

Trees

Correlation coefficient=+0.71
Standard error of the mean= 0.11

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Senegalia nigrescens	T	2	0.34	0.2	+0.13
Normal competition range:					
Combretum imberbe	T	1	0.03	0.02	+0.01
Combretum apiculatum subsp. apiculatum	T	1	0.03	0.02	+0.01
Philenoptera violacea	T	1	0	0.02	-0.02
Weak competitors:					
Sclerocarya birrea subsp. caffra	T	2	0.07	0.2	-0.14
Total cover for species in group:			0.47		

Shrubs

Correlation coefficient=+0.25
Standard error of the mean= 0.04

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Combretum imberbe	S1.5	1	0.13	0.04	+0.1
Normal competition range:					
Philenoptera violacea	S1.5	2	0.07	0.07	+0
Senegalia nigrescens	S1.5	1	0.03	0.04	-0
Cissus cornifolia	S1.5	1	0.03	0.04	-0
Diospyros lycioides subsp. sericea	S1.5	1	0.03	0.04	-0
Gymnosporia buxifolia	S2	1	0.03	0.04	-0
Flueggea virosa subsp. virosa	S1.5	1	0.03	0.04	-0

Combretum hereroense	S1.5	1	0.03	0.04	-0
Dichrostachys cinerea	S2	1	0.03	0.04	-0
Vachellia tortilis subsp. heteracantha	S2	1	0	0.04	-0.03
Pappea capensis	S1.5	1	0	0.04	-0.03

Total cover for species in group: 0.44

Dwarf Shrubs

Correlation coefficient=+0.43
Standard error of the mean= 0.12

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Dichrostachys cinerea	D0.5	2	0.57	0.14	+0.43
Normal competition range:					
Senegalia nigrescens	D1	2	0.17	0.14	+0.03
Flueggea virosa subsp. virosa	D0.5	3	0.2	0.22	-0.02
Dichrostachys cinerea	D1	1	0.13	0.06	+0.08
Ehretia amoena	D0.5	3	0.17	0.22	-0.05
Grewia flava	D0.5	1	0.13	0.06	+0.08
Maerua edulis	D0.5	2	0.07	0.14	-0.07
Cissus cornifolia	D1	2	0.07	0.14	-0.07
Pappea capensis	D0.5	2	0.07	0.14	-0.07
Philenoptera violacea	D1	2	0.07	0.14	-0.07
Ziziphus mucronata	D0.5	2	0.07	0.14	-0.07
Grewia bicolor	D0.5	1	0.03	0.06	-0.02
Solanum panduriforme	D0.5	1	0.03	0.06	-0.02
Aspargus setaceus	D1	1	0.03	0.06	-0.02
Grewia flava	D1	1	0.03	0.06	-0.02
Senegalia nigrescens	D0.5	1	0.03	0.06	-0.02
Vachellia exuvialis	D0.5	1	0.03	0.06	-0.02
Flueggea virosa subsp. virosa	D1	1	0	0.06	-0.05
Sclerocarya birrea subsp. caffra	D0.5	1	0.03	0.06	-0.02

Total cover for species in group: 1.94

Community Structure

Growth Form

Tree	0.47
Shrub	0.44
Dwarf Shrub	1.94
Total class cover	2.86
Dwarf shrub proportion	68.03
Shrub proportion	15.4
Tree proportion	16.57

ANNEXURE H: Community composition analysis grouped according to growth forms for the Mopani Experimental Burn Plot

No Burn treatment

Trees

Correlation coefficient=+1.00
Standard error of the mean= 0.14

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Terminalia prunioides	T	1	0.3	0.1	+0.20
Normal competition range:					
Colophospermum mopane	T	3	11.56	11.56	+0
Commiphora glandulosa	T	1	0.03	0.1	-0.07
Vachellia exuvialis	T	1	0.03	0.1	-0.07
Philenoptera violacea	T	1	0.03	0.1	-0.07
Total cover for species in group:			11.96		

Shrubs

Correlation coefficient=+0.93
Standard error of the mean= 0.96

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Colophospermum mopane	S2	3	5.54	4.18	+1.36
Normal competition range:					
Jasminum stenolobum	S1.5	1	0.03	0.03	-0
Commiphora africana var. africana	S2	1	0.03	0.03	-0
Flueggea virosa subsp. virosa	S2		0.03	0.03	-0
Philenoptera violacea	S1.5		0.03	0.03	-0
Weak competitors:					
Colophospermum mopane	S1.5	3	2.82	4.18	-1.36
Total cover for species in group:			8.5		

Dwarf Shrubs

Correlation coefficient=+0.28
Standard error of the mean= 0.03

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Senegalia nigrescens	D0.5	1	0.13	0.05	+0.09
Solanum panduriforme	D0.5	1	0.13	0.05	+0.09
Normal competition range:					
Colophospermum mopane	D0.5	2	0.07	0.07	-0
Commiphora africana var. africana	D0.5	2	0.07	0.07	-0
Cissus cornifolia	D1	2	0.07	0.07	-0
Vachellia exuvialis	D0.5	2	0.07	0.07	-0
Dichrostachys cinerea	D0.5	2	0.07	0.07	-0
Commiphora glandulosa	D1	1	0.03	0.05	-0.01
Commiphora glandulosa	D0.5	1	0.03	0.05	-0.01
Colophospermum mopane	D1	1	0.03	0.05	-0.01
Commiphora africana var. africana	D1	1	0.03	0.05	-0.01
Aspargus setaceus	D0.5	1	0.03	0.05	-0.01
Lannea schweinfurthii	D1	1	0.03	0.05	-0.01
Ormocarpum trichocarpum	D1	1	0.03	0.05	-0.01
Ormocarpum trichocarpum	D0.5	1	0.03	0.05	-0.01
Vachellia exuvialis	D1	1	0.03	0.05	-0.01
Flueggea virosa subsp. Virosa	D1	1	0.03	0.05	-0.01
Dichrostachys cinerea	D1	1	0.03	0.05	-0.01
Weak competitors:					
Grewia bicolor	D0.5	1	0	0.05	-0.04
Total cover for species in group:			0.97		

Community Structure

Growth Form	
Tree	11.96
Shrub	8.5
Dwarf shrub	0.97
Total class cover	21.43
Dwarf shrub proportion	4.53
Shrub proportion	39.65
Tree proportion	55.82

February Triennial Burn

Trees

Correlation coefficient=+1.00
Standard error of the mean= 0.02

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Normal competition range:					

Commiphora africana var. africana	T	1	0.03	0.02	+0.01
Philenoptera violacea	T	1	0.03	0.02	+0.01
Colophospermum mopane	T	3	12.09	12.09	0

Weak competitors:

Jasminum stenolobum	T	1	0	0.02	-0.02

Total cover for species in group: 12.16

Shrubs

Correlation coefficient=+0.81
Standard error of the mean= 1.81

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Normal competition range:					
Colophospermum mopane	S2	3	5.41	3.6	+1.81
Commiphora africana var. africana	S2	1	0.03	0.03	+0
Commiphora africana var. africana	S1.5	1	0.03	0.03	+1
Weak competitors:					
Colophospermum mopane			1.78		

Total cover for species in group: 7.26

Dwarf Shrubs

Correlation coefficient=+0.84
Standard error of the mean= 0.06

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Commiphora africana var. africana	D1	2	0.27	0.16	+0.10
Senegalia nigrescens	D1	1	0.13	0.05	+0.08
Senegalia nigrescens	D0.5	1	0.13	0.05	+0.09
Normal competition range:					
Colophospermum mopane	D1	3	0.3	0.28	+0.02
Commiphora africana var. africana	D0.5	1	0.03	0.05	-0.02
Aspargus setaceus	D0.5	1	0.03	0.05	-0.02
Solanum panduriforme	D0.5	1	0.03	0.05	-0.02
Flueggea virosa subsp. virosa	D1	1	0.03	0.05	-0.02
Dichrostachys cinerea	D1	1	0.03	0.05	-0.02
Dichrostachys cinerea	D0.5	1	0.03	0.05	-0.02
Aspargus setaceus	D1	1	0	0.05	-0.05
Lannea schweinfurthii	D0.5	1	0	0.05	-0.06

Weak competitors:

Colophospermum mopane	D0.5	3	0.2	0.28	-0.08

Total cover for species in group: 1.24

Community Structure

Growth Form	
Tree	12.16
Shrub	7.26
Dwarf shrub	1.24
Total class cover	20.66
Dwarf shrub proportion	6
Shrub proportion	35.12
Tree proportion	58.87

August Triennial Burn

Trees

Correlation coefficient=+1.00
Standard error of the mean= 0.00

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Normal competition range:					
Colophospermum mopane	T	3	5.1	5.1	+0
Combretum imberbe	T	1	0.03	0.03	-0
Combretum apiculatum subsp. apiculatum	T	1	0.03	0.03	-0

Total cover for species in group: 5.17

Shrubs

Correlation coefficient=+0.62
Standard error of the mean= 4.28

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Normal competition range:					
Colophospermum mopane	S2	3	7.16	4.13	+3.02
Senna petersiana	S2	1	0.03	0.03	+0
Colophospermum mopane	S1,5	3	1.11	4.13	-3.03

Total cover for species in group: 8.3

Dwarf Shrubs

Correlation coefficient=+0.97

Standard error of the mean= 0.07

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Commiphora africana var. africana	D1	1	0.13	0.03	+1.10
Normal competition range:					
Colophospermum mopane	D1	3	0.6	0.57	0.03
Colophospermum mopane	D0.5	3	0.6	0.57	0.04
Combretum apiculatum subsp. apiculatum		1	0.03	0.03	-0
Solanum lichtensteinii	D0.5	1	0.03	0.03	-1
Grewia bicolor	D0.5	1	0.03	0.03	-2
Dichrostachys cinerea	D0.5	1	0.03	0.03	-3
Pappea capensis	D1	1	0	0.03	-0.03
Weak competitors:					
Commiphora africana var. africana	D0.5	2	0.17	0.3	-0.14
Total cover for species in group:			1.64		

Community Structure

Growth Form	
Tree	5.17
Shrub	8.3
Dwarf shrub	2.64
Total class cover	15.11
Dwarf shrub proportion	10.88
Shrub proportion	54.91
Tree proportion	34.22

August Annual Burn

Trees

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Colophospermum mopane	T		4.6		
Total cover for species in group:			4.6		

Shrubs

Correlation coefficient=+0.87
Standard error of the mean= 2.15

	Height class code	(F)	Actual Cover	Pred. cover	Difference

Strong competitors:

Colophospermum mopane	S1.5	2	7.42	4.2	+3.23

Normal competition range:

Commiphora africana var. africana	S1.5	1	0.03	0.56	-0.53
Cissus cornifolia	S1.5	1	0.03	0.56	-0.53
Philenoptera violacea	S1.5	1	0	0.56	-0.56
Colophospermum mopane	S2	3	6.22	7.83	-1.61

Total cover for species in group: 13.71

Dwarf Shrubs

Correlation coefficient=+0.88
Standard error of the mean= 0.47

	Height class code	(F)	Actual Cover	Pred. cover	Difference
Strong competitors:					
Colophospermum mopane	D1	3	3.53	2.72	+0.81
Normal competition range:					
Colophospermum mopane	D0.5	2	1.75	1.35	+0.40
Commiphora africana var. africana	D1	1	0.13	-0.03	+0.16
Grewia bicolor	D1	1	0.13	-0.03	+0.16
Commiphora glandulosa	D0.5	1	0.03	-0.03	+0.06
Terminalia prunioides	D0.5	1	0.03	-0.03	+0.06
Commiphora africana var. africana	D0.5	1	0.03	-0.03	+0.06
Cissus cornifolia	D1	1	0.03	-0.03	+0.06
Combretum apiculatum subsp. Apiculatum		1	0.03	-0.03	+0.06
Vachellia exuvialis	D0.5	1	0.03	-0.03	+0.06
Dichrostachys cinerea	D0.5	1	0.03	-0.03	+0.06
Aspargus setaceus	D1	1	0	-0.03	+0.03
Philenoptera violacea	D0.5	1	0	-0.03	+0.03
Weak competitors:					
Ormocarpum trichocarpum	D1	2	0.34	1.35	-1.01
Ormocarpum trichocarpum	D0.5	2	0.34	1.35	-1.02

Total cover for species in group: 6.45

Community Structure

Growth Form	
Tree	4.6
Shrub	13.71
Dwarf shrub	6.45
Total class cover	24.77

Dwarf shrub proportion	26.05
Shrub proportion	55.36
Tree proportion	18.58