

important factor in providing a mosaic of structurally diverse vegetation. If prescribed burns are necessary, avoid implementation during Spring. When planning prescribed burns, refer to the periods of vulnerability of species likely to be located within the burn area, and develop appropriate mitigation measures for their protection. Avoid prescribed fire during times of prolonged drought. Minimise introduction of high intensity fires during prescribed burning and backburning operations.

Avoid damaging/felling hollow-bearing and known nest/feed trees when establishing control lines, mopping up and during prescribed burning. If habitat trees are located on control lines remove fuel from base of tree, prior to prescribed burning or backburning. During mop up activities try to extinguish fire rather then falling tree. Species known to occur within Park

DECCW Cultural Heritage Databases must be accessed during incidents and in planning for hazard reduction burning or other works to ensure new records are considered. Aboriginal site information from AHIMS is sensitive and subject to a Memorandum of Understanding. Site data must be used appropriately. Identified sites will be protected. Protection measures will be addressed in impact assessments and operational plans for Where possible, trained officers will provide advice on site protection methods. A thorough survey of Aboriginal cultural heritage has not been conducted within the Park. It is therefore not known with any certainty whether there are sites that can be damaged by fire. Known sites consist of open artefact scatters, but in areas adjacent to the Park, art sites have been found. Other

MAP 5: CULTURAL HERITAGE

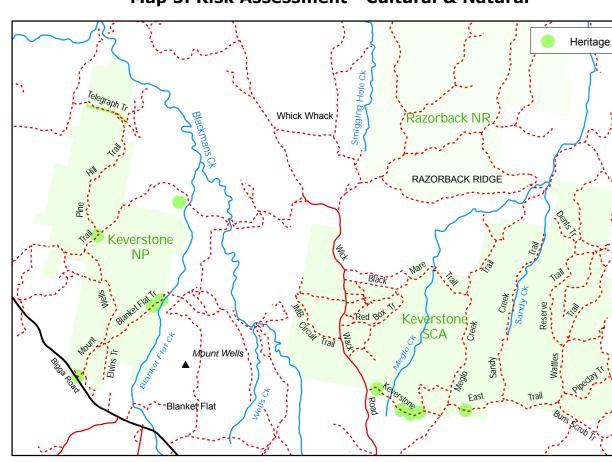
unidentified sites may occur across the landscape, especially in riparian areas, along ridges and rock **Site Management** during fire operations. During wildfire operations, efforts will be made to survey for Aboriginal sites ahead of earthmoving Encourage survey of Aboriginal sites after fires when site visibility is increased. Inspect affected sites after wildfire and apply erosion works where necessary The only known historic site within the Park is the open wire telephone line. Other sites may exist that have not been recorded on NPWS databases. Any new sites should be identified, entered into NPWS Historic Heritage database and protected during fire suppression and prescribed burning programs. All personnel involved in control line construction and vehicle based fire suppression operations are to be briefed on site locations and the required management strategies for site protection. Specific site protection strategies are to be included in Incident Action Plans. Prescribed burning or back burning activities should minimise the potential for site disturbance. Historic Heritage

Management

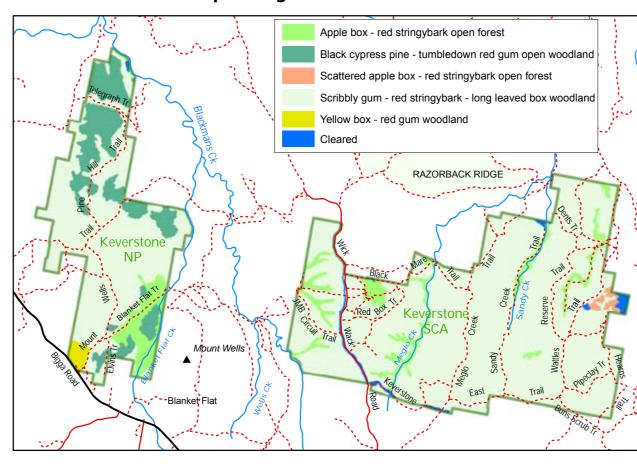
Management Management Protect during backburning and prescribed burning operations. Notify earthmoving operators or supervisors, of location of line to ensure poles are not damaged by This site is located on adjacent private property. It consists of stone ruins, and has limited fabric that would be damaged by fire. It is located within a cleared area, and does not require protection

strategies to be implemented on park Note: Cultural heritage sites are based on data recorded on AHIMS and HHIMS databases and field data recorded as

Map 5: Risk Assessment - Cultural & Natural



Map 2: Vegetation Communities



MAP 2: VEGETATION COMMUNITIES						
Vegetation Formation (Keith, 2002)	Vegetation Community Description	Vegetation Group (Gellie, 2005)	Reserve (GIS) Ha's	% Reserve		
Grassy Woodlands	Yellow Box – Red Gum Woodland	160	17.76	0.59		
Dry Sclerophyll Forests (shrubby subformation)	Apple Box-Red Stringybark Open Forest	109, 122	243.58	8.05		
	Scribbly Gum-Red Stringybark-Long Leaved Box Woodland	114	2499.82	82.57		
	Black Cypress Pine-Tumbledown Red Gum Open Woodland	201	237.6	7.85		
	Cleared Land		32	1.06		

				FICANT VEGETATION COMMUNITIES		
Group A, B , C	Listed Significa Communities	Excep	Significant Flora Management Guidelines & Considerations Except for asset protection, fire will be introduced in accordance with the biodiversity fire regime thresholds. Minimise the use of earth moving equipment. Minimise the size and intensity of all fires.			
A	Box-Gum Woodland	gum wo Species Yass Da	There is a small area of Box-gum woodland located in the western portion of the park. Box-gum woodland is listed as an endangered ecological community under the Threatened Species Conservation (TSC) Act. This community also contains the known location of the Yass Daisy, which is also listed as vulnerable under the TSC Act. Backburning and prescribed burns are permitted within thresholds.			
В	Black Cypres: Pine-Tumbledo Red Gum Ope Woodland	and low this spe many y Ensur burns fires o	Black Cypress Pine remains relatively uncleared due to its occurrence on relatively rocky and low-fertile hills. The greatest threat to this community is inappropriate fire regimes as this species is sensitive to fire (Porteners, 2008), as <i>Callitris</i> seedlings and juveniles take many years to reach maturity. □ Ensure that the fire sensitivity of the community is considered when planning prescribed burns for asset protection. Introduced fire could potentially result in high intensity crown fires causing tree death. □ Backburning is permitted within threshold.			
С	Apple Box-Re Stringybark Op Forest	en stands highly o	Apple Box communities are inadequately conserved across their distribution, remnant stands are generally highly fragmented and in poor condition due to being cleared and highly disturbed. The Apple Box found in Keverstone NP and SCA is in relatively good condition (Porteners 2008). Backburning and prescribed burns are permitted within thresholds.			
D	Riparian Zone	enviro	□ Avoid the use of fire suppression chemicals within 100 m of streams, & riparian environments. □ If prescribed burns are deemed necessary, minimise disturbance by not introducing fire directly into streams. Attempt to keep fire at least 100 m from these areas. Threatened Flora Management			
Group		cientific ame				
V Ascellater		Ammobium Paspedioides	. ν	□ If identified, implement protection strategies during fire suppression a management activities. □ Minimise mechanical disturbance and construction of roads and trails within known locations. □ Do not use fire suppression chemicals within 50 m of known locations this species. □ The species should be monitored to ensure weed species do not interference.		

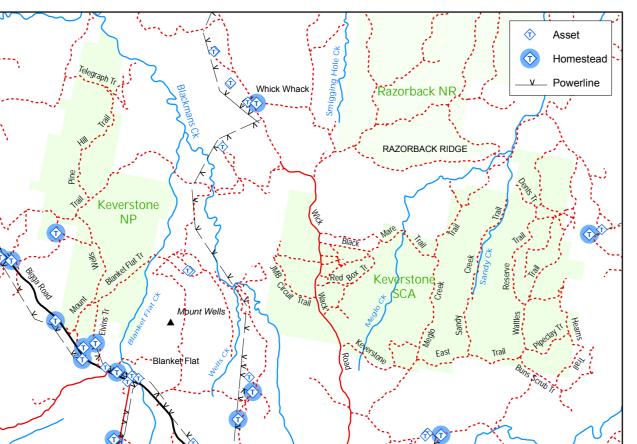
The following flora species are listed on the TSC Act and potentially occur in the habitats described for Keverstone NP and *Caesia parviflora* var. *minor (*Endangered), *Calotis glandulosa,* (Vulnerable)*, Goodenia macbarronii* (Vulnerable)*, Eucalyptu* pulverulenta (Vulnerable), Eucalyptus robertsonii subsp. hemisphaerica (Vulnerable) (Porteners 2008). These species will be managed in accordance with the biodiversity thresholds for the vegetation community in which they occur. Regionally Significant Plant Species The following species, occurring within the Park are regionally significant as they are at the limit of their distribution. These species will be managed in accordance with the biodiversity thresholds for the vegetation community in which they occur: Acrotriche serrulata (Ground Berry), Tetratheca bauerifolia (Black-Eyed Susan), Acacia vestita (Weeping Boree), Poa sieberiana var. cyanophylla.(Tussock forming snowgrass) (Porteners 2008).

significant community group A.

□ Potential habitat for these species will be protected as per guidelines for

		SMENT – LIFE & PROPERTY		
Asset	Vulnerability	Risk Mitigation		
Private properties/ farm buildings	Vulnerable to fire coming from the Park, particularly under the influence of westerly winds.	□ Participate in the development and where appropriate implementation of fire management proposals regarding asset protection, through the RFS Bushfire Management Committee. □ Maintain access trails (for vehicle category identified within the Draft Road Plan) within the Park for use in fire suppression. □ Reduce fuel in targeted windrows. □ Respond to unplanned fire events as soon as possible. □ Implement annual fire management work schedule. □ All fires reported or known to occur within the Park will be reported to the RFS. □ Provide media briefing/releases to communicate strategies and updates of fire activity to those potentially affected.		
Visitors to the Park	Vulnerable to impact from fire within the Park.	□ As above □ If a fire breaks out, check for visitors (preferably by air) and give directions if required. □ Park closure may be implemented during periods of very high fire danger, when the Park is threatened by fire, or when a fire is actually burning in the Park. □ Partial Reserve Fire Bans, such as a ban on solid fuel, can be considered.		
Park Assets	There are currently no identified assets within the Park.	□Once park visitor facilities are constructed, maintain fuel reduced areas surrounding public assets as required. □Mitigation measures for open wire telephone line are detailed within Table 5: Cultural Heritage.		

Map 6: Risk Assessment - Property



Within Threshold RAZORBACK RIDGE

Map 3: Vegetation Threshold Analysis

	MAP 3: VEGE	TATIO	N BIOD	IVERSI	TY THRESHOLDS
Vegetation Formation	Vegetation Community Description	Minimum Fire Interval	Maximum Fire Interval	Fire History Evaluation	Guidelines
Dry Sclerophyll Forests - shrubby subformation	Apple Box-Red Stringybark Open Forest; Scribbly Gum- Red Stringybark-Long Leaved Box Woodland; Black Cypress Pine- Tumbledown Red Gum Open Woodland	10	30	100% within threshold	□ A decline in biodiversity is predicted if 3 or more consecutive fires occur with inter – fire intervals of < 7yrs. □ Given the lack of knowledge of ecosystem function without fire, the upper limits of these thresholds are untested. Fire should only be introduced into the Park for the protection of assets, and ecological purposes if there is a demonstrated biodiversity decline. □ Long-unburnt areas are ecologically significant, as there may be relatively few areas represented. □ Too frequent fires may promote fire tolerant shrubs.
Grassy Woodlands	Yellow Box – Red Gum Woodland	8	40	100% within threshold	□As above □Minimum interval of 10 years should apply in the Southern Tablelands region
ote: These are indicative biodiversity thresholds based on broad state wide guidelines. The broad thresholds are based on an analysis of known flora response to fire using ant vital attributes, and including compatibility of known fauna requirements, for identified broad vegetation formations (Kenny et al, 2004). Vegetation communities as itlined in Map 2 have been classified into formations to determine the appropriate biodiversity threshold guidelines. These thresholds, while accounting for some key flora					

and fauna variables, do not account for the whole variability in the landscape. Therefore such thresholds must be used with caution (Kenny et al, 2004). Interpretation of th and rations variables, to not extract the whole variables in the landscapes. Therefore such interestories are interestories with cauchy from the whole variables of the thresholds should be done in association with local knowledge, detailed survey and planning associated with prescribed burn proposals and utilising the results of local monitoring programs (Kenny et al, 2004). It is noted that there is very little data available on the response of fauna species to fire regimes and therefore more attention should be paid to fauna species at the local level when considering applying the thresholds.

	MAP 3: STATUS OF FIRE FREQUENCY THRESHOLDS					
Threshold	Vegetation Community	% of Reserve	Interpretation & Management Guidelines			
Below Minimum Frequency Threshold	N/A	0	□The inter fire intervals have been too short. □In these areas, species and populations sensitive to short fire intervals may experience a decline in abundance to a point where they risk local extinction. □Protect from fire as far as possible.			
Within Frequency Threshold	Apple Box–Red Stringybark Open Forest; Scribbly Gum-Red Stringybark-Long Leaved Box Woodland; Black Cypress Pine- Tumbledown Red Gum Open Woodland; Yellow Box – Red Gum Woodland	100	□Fire history is within the threshold for the vegetation community. □Fire is neither required or to be avoided.			
Above Maximum Frequency Threshold	N/A	0	□Where the age of a vegetation community is greater than the maximum fire interval for the community. □If fires continue to be excluded, a decline in biodiversity may result through the senescence of plants and their seed banks. □Long-unburnt areas are, however, ecologically significant, as there may be relatively few areas represented. □Consider implementing an ecological burn or allow the area to burn under suitable conditions.			

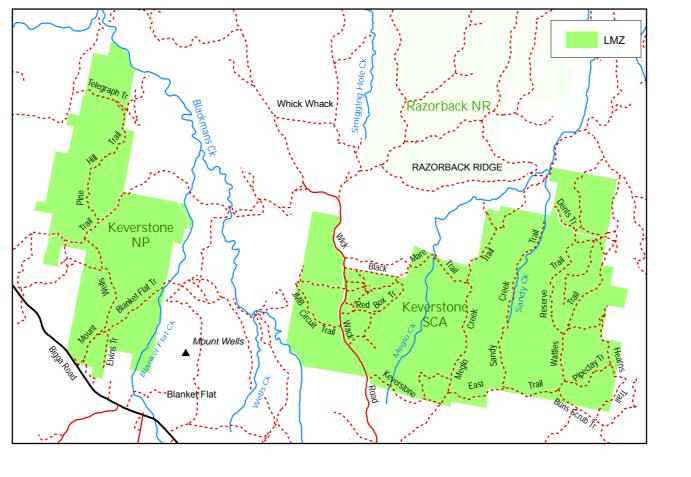
Note: The threshold analysis is derived from vegetation biodiversity thresholds and recorded fire history. In the event of fire, the analysis must be performed again to establish new thresholds. Fire history for the Park is unknown, therefore all vegetation communities are considered within threshold

SUMMARY GUIDELINES FOR THE PROTECTION OF NATURAL

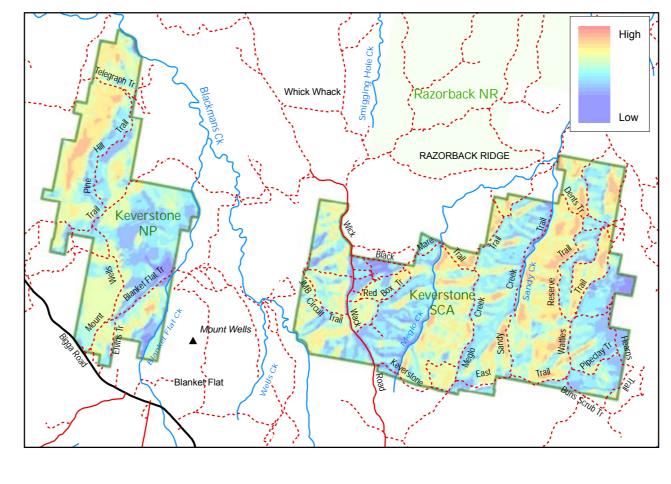
Except for asset protection, fire should only be applied in response to a demonstrated loss of biodiversity. Fire will be introduced in accordance with the biodiversity fire regime thresholds. Avoid implementation of prescribed burns during Spring, and during times of prolonged drought. Minimise introduction of high intensity fires during prescribed burning operations. Avoid damaging/felling hollow-bearing and nest/feed trees when establishing control lines, mopping up and during prescribed burning. During mop up activities try to extinguish fire rather then falling tree. If habitat trees are located on control lines remove fuel from base of tree, prior to prescribed burning or backburning. Minimise the use of earth moving machinery in the Boxgum woodland, Applebox -Red Stringybark open forests, and Black If an existing trail is being maint ained as part of fire management activities, do not widen or move debris into the Boxgum Avoid the use of fire suppression chemicals within 50m from the trail as it passes the Boxgum woodland, to avoid impacts of its use on the Yass Daisy.

MAP 7: BUSH FIRE MANAGEMENT ZONES - DEFINITIONS Asset Protection Zone The purpose of APZ is to protect human life, property and highly valued public assets and To provide strategic areas of fire protection advantage which will reduce the speed and Strategic fire Advantage intensity of bushfires, reduce the potential for spot fire development, and aid containment of bushfires to existing management boundaries Land Management Zone | The objective of land management strategies within this zone are for the protection of natural and cultural heritage, and to reduce the likelihood of spread of fires. PARK BUSH FIRE MANAGEMENT ZONES Minimise size and intensity of wildfires, and manage to ☐ Prescribed fire will be used where deemed produce a mosaic burn pattern, where weather conditions necessary for asset protection or ecological Attempts can be made to increase burn patchiness by use □ Assess cooperative fire management programs of incendiaries, retardant, water bombing etc. with adjacent landholders and implement where Minimise the use of earth moving equipment within the appropriate, in consultation with BFMC. Boxgum woodland, Applebox- Red Stringybark open forest, ☐ Establish 2-5 m fuel reduced area surrounding ☐ Fire suppression chemicals may be used to suppress fire, ☐ Once park facilities are constructed, maintain however, minimise use within 100 m of drainage lines, and fuel reduced area as required. ☐ Conduct fuel hazard assessment every 5 years. within 50 m of known Yass Daisy locations. Protect mature trees and minimise felling large and hollow 🗆 Establish monitoring program to identify areas bearing trees during mop up activities. where vegetation community is senescing due to

Map 7: Bushfire Management Zones



Map 4: Bushfire Behaviour Potential



MAP 4: BUSHFIRE BEHAVIOUR POTENTIAL						
Vegetation Fuel Hazard Rating (under moderate conditions in mature vegetation communities) The ratings and modelling are specific to the Park. The information is not for comparison of the broader landscape managed by the NPWS Southern Ranges Region.						
Rating	Vegetation Description % of Reserve					
Low	Cleared 1.1					
Moderate	Nil	Nil N/A				
High	Apple Box-Red Stringybark Open Forest Yellow Box - Red Gum Woodland 8.6					
Very High	Scribbly Gum-Red Stringybark-Long Leaved Box Woodland Black Cypress Pine-Tumbledown Red Gum Open Woodland 90.3					
	Aspect Bu	shfire Behaviour	Slope Bushfire Behaviour			
Ratir	ng Aspect in degrees		Rating	Slope in degrees		
Low	ow 80 - 200		Low	0 - 10 ⁰		
Moder	ate	30 - 80 & 200 - 240	Moderate	10 - 20 ⁰		
High	High 10 - 30 & 240 -260 High 20 -30 ⁰					
Very H	Very High 260 - 10 Very High >30°					

Bushfire behaviour at any position on the landscape reflects □Site attributes such as vegetation type, slope, aspect and elevation (can affect fuel levels, structure and moisture □Fire weather attributes such as temperature, relative humidity, wind direction and wind speed. While these characteristics are difficult to predict, bad fire weather days are generally associated with winds from the north-west to The Park generally consists of a parallel series of north-south ridgelines and gullies. The western slopes within the Park, primarily associated with Pine Hill, Meglo and Sandy Creeks, have the highest fire behaviour potential, due to their steepness and exposure to both afternoon sun and drying north westerly to westerly winds through summer. The north-west aspect, close proximity of one ridge to another, and the presence of rough barked species on the ridges means that spotting potential from one ridge to another is high. Lower fire behaviour is found on the more sheltered easterly aspects, or with more gently undulating slopes, for example, north of Blanket Flat area. The fuel moisture levels are generally higher, thus mitigating fire behaviour under moderate conditions. However, during extended drought periods or severe fire weather conditions all vegetation communities have

ANALYSIS OF BUSHFIRE BEHAVIOUR POTENTIAL

Bushfire Coordinating Committee (2007). $\underline{\mathsf{BFCC}}$ Policy 2/07 – Fire Trails. NSW Rural Fire Service Gellie, N. 2005. <u>Vegetation of the Southern Forests Manuscript</u>, Maps and Appendices (Version 1.2). Higgins et al. 2001. <u>Handbook of Australian, New Zealand and Antartic Birds</u>. Oxford University Press,

the potential to support extreme fire behaviour.

Environment. Melbourne, Victoria.

NPWS. 2006. State Incident Plan. Department of Environment and Conservation, NSW. NPWS. 2009. Fire Management Manual. Department of Environment, Climate Change and Water, NSW. Porteners, 2008. <u>Vegetation Survey and Mapping of Keverstone State Forest</u>. Unpublished report to Department of Environment and Climate Change, NSW. RFS. Standards for Asset Protection Zones. NSW Rural Fire Service document.

Southern Tablelands Zone Bushfire Management Committee, 2009. <u>Bushfire Risk Management Plan</u>. NSW Rural Fire Service.

Keith, D.A. 2002. A compilation map of native vegetation for New South Wales. Biodiversity Strategy, NSW Government. Kenny et al. 2004. <u>Guidelines for Ecologically Sustainable Fire Management.</u> National Parks and Wildlife Service, NSW. McCarthy, G.J., Tolhurst, K.G., and Chatto, K. 1999. Overall Fuel Hazard Guide. Department of Natural Resources and

MAP 8: FUELS AND FIRE BEHAVIOUR

Fuels are variable across the Park reflecting complex interactions between vegetation type, aspect and topography. Fuel sampling was conducted in March 2009 at 12 sites throughout the Park. The assessment approach applied was to determine the Overall Fuel Hazard (OFH) Rating (McCarthy et al., 1999). Rather then only considering surface fine fuel loads (t/ha), this assessment shifts the emphasis to considering the whole fuel complex, and particularly the bark and elevated fuels – bark and elevated fuels being the fuel elements principally responsible for both first attack failure and also for general suppression difficulty. Information gained whilst assessing the OFH was used to provide a coarse estimate of surface fine fuel load (t/ha). The major findings of the fuel sampling program were: The maximum surface fine fuel load assessed was 8 t/ha.

were dominated by red stringybark (*E. macrorhyncha*): Sheltered gully communities carry high levels of biomass due to the higher moisture availability, which generally equates to high fuel loads. They are also usually located in low fire prone areas due to their topographic position and aspect. Therefore fuel loads in gully communities may not necessarily be reduced, even in some wildfire incidents. Communities dominated by red stringybark have a high to very high bark hazard rating which increased the OFH rating. This is due to long unburnt stringybark allows fire to climb trees and cause spotting.

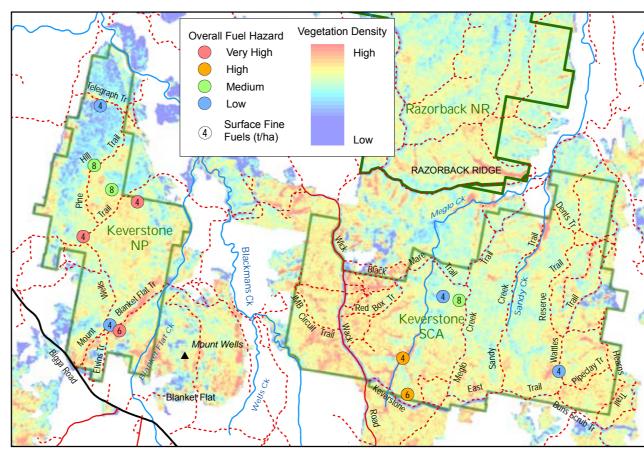
□Sites that were classified as having high or very high overall fuel hazard rating were either located in gully communities, or

burn would be required. This may have the negative outcome of replacing a grassy understorey with a regenerating shrub layer, therefore increasing the elevated fuel rating. High elevated fuels can impede access for earth moving These 12 sites have been established as permanent fuel monitoring sites, to better understand fuel dynamics across the

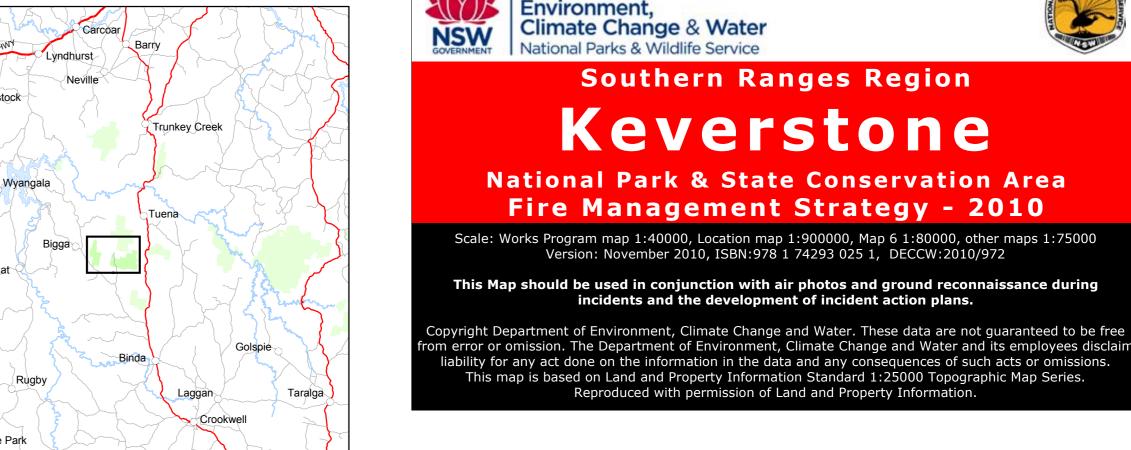
These sites had variable surface and elevated fuel hazard ratings. To reduce the bark hazard a high intensity prescribed

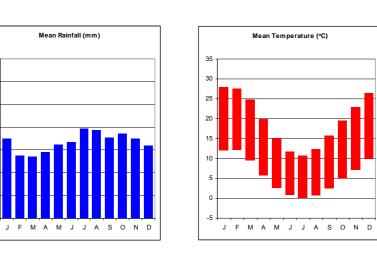
Park. If an area is within biodiversity threshold, identified to have high fuel loads, and there is a risk to life and property, additional temporary fuel monitoring sites will be located within that area for determination of whether a prescribed burn is required. Management options would be discussed with the Southern Tablelands Zone Bushfire Management Committee. Windrows, established when the trail network was originally constructed, are located on most trails within the Park. A program to reduce fuel in the windrows has commenced, and treatment of targeted windrows will continue throughout the life of this plan. If backburning or prescribed burning operations are conducted using the trails as control lines, adequate resourcing must be committed to ensure the edge is mopped up and blacked out and to reduce potential impacts from

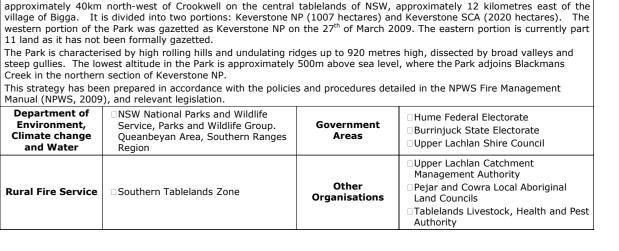
Map 8: Fuel Landscape

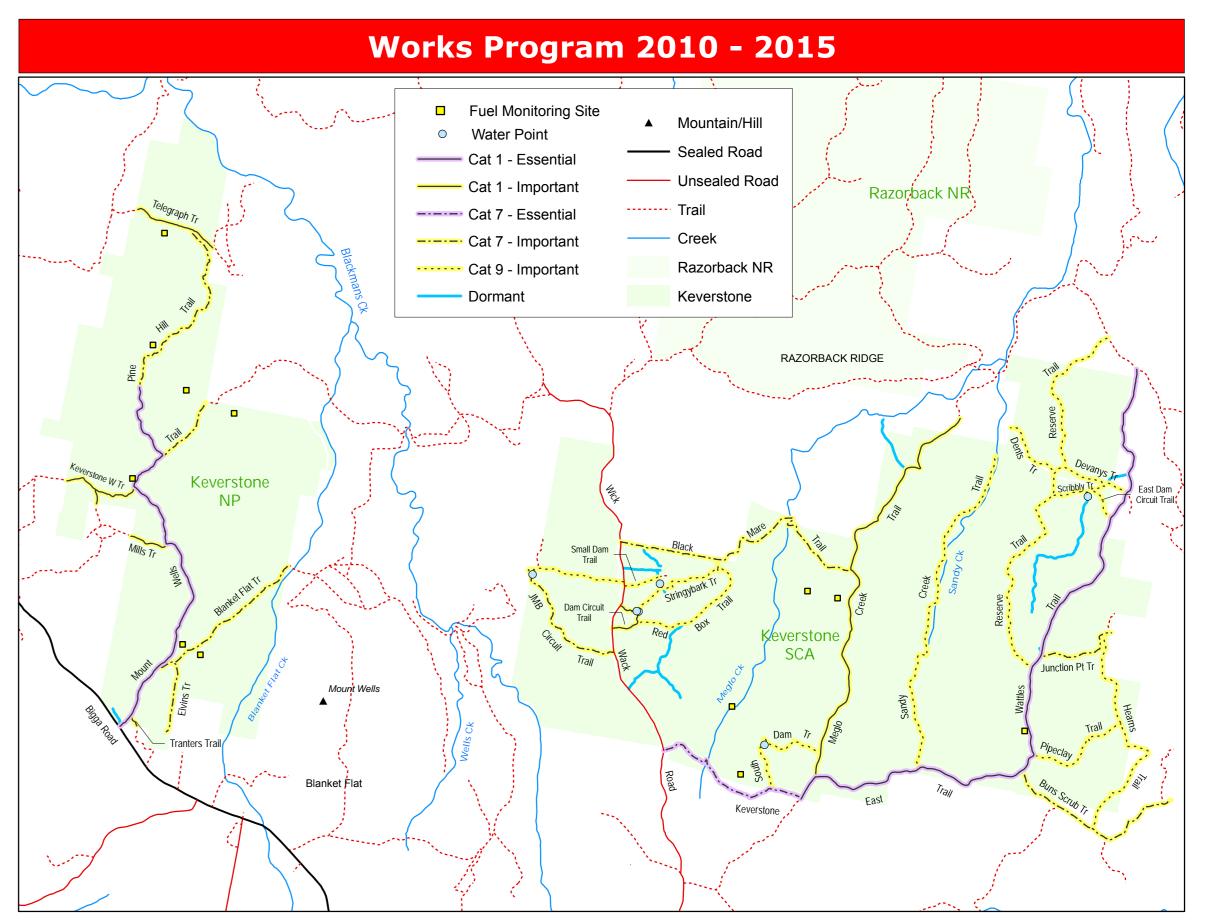


Location









	Priority	Name, Area or Detail	Management Strategy
Trails	High	Public and Management Trails	 Maintain trail network for vehicle category identified in the Draft Road Plan. All trails to be clearly signposted at intersections and trailheads. Ensure earthmoving equipment operators are aware of location of heritage sites and ensure protection.
Tuils	Medium	Public and Management Trails	☐ Reduce fuel in targeted windrows to reduce risk of spotting and increased rate of spread.
	High	Dormant Trails	$\hfill\square$ Record unmapped dormant trails within Park.
	Low	Dormant Trails	□ Could be used during emergencies once upgraded to Cat 9 standard.□ May be re-opened as a control line option.
Land lagement Zones	High	As identified in Map 7	□ Prescribed burns fire will be implemented where deemed necessary for asset protection. □ Any proposed prescribed burn must be in line with DECCW policy and managed in accordance with the RFS Bushfire Management Committee.
rmation & esearch		Fuel monitoring	Conduct fuel monitoring program, including photo reference points. Establish further fuel monitoring.
	High	Mapping fire	Map all bushfires and prescribed burns to enable data collection on fire frequency, intensity, rate of spread and area burnt.
	Low	Assessment of senescent vegetation	Establish monitoring program to identify areas where vegetation community is senescing due to lack of fire.
	LUVV		

High Liaise with NSW RFS, and Neighbours

Management Strategy ■ Maintain trail network for vehicle category identified in the Draft Road Plan. □ All trails to be clearly signposted at intersections and trailheads.

aware of location of heritage sites and ensure protection. □ Reduce fuel in targeted windrows to reduce risk □ Reduce fuel in targeted windrows by prescribed of spotting and increased rate of spread. □ Record unmapped dormant trails within Park. □Could be used during emergencies once upgraded to Cat 9 standard. □May be re-opened as a control line option.

☐ Prescribed burns fire will be implemented where deemed necessary for asset protection. □Any proposed prescribed burn must be in line with DECCW policy and managed in accordance with the RFS Bushfire Management Committee.

Management Committee, RFS volunteer

□Undertake joint training exercises.

☐ Liaise with academic and research institutions to encourage research in the Park relevant to Ongoing □ Attend meetings with the NSW RFS Bushfire

☐ Assess trails annually and maintain as required or

as specified in Regional Operations Program. ☐ Maintain directional signage throughout fire trail network as required. ☐ Chemical fuel reduction of management trails as

burning, mulching or dispersal. ☐ Identify and map unrecorded dormant trails. Assess trails and document condition and suitability for fire suppression activities, every 5

Assess cooperative fire management programs with adjacent landholders and implement where appropriate, in consultation with BFMC. Conduct fuel hazard assessment as per fuel monitoring schedule. ☐ Establish 2-5 m fuel reduced area surrounding representative poles, by removing dead timber and slashing grass. Once park visitor facilities are constructed,

maintain fuel reduced areas as required. photo reference points. Establish further fuel Conduct fuel hazard assessment every 5 years.

Map the extent, patchiness and intensity, where possible, of all bushfires and prescribed burns. Incorporate data into fire management and incident databases. ☐ Establish monitoring program to identify areas ☐ Establish monitoring program to identify areas where vegetation community is senescing due to