

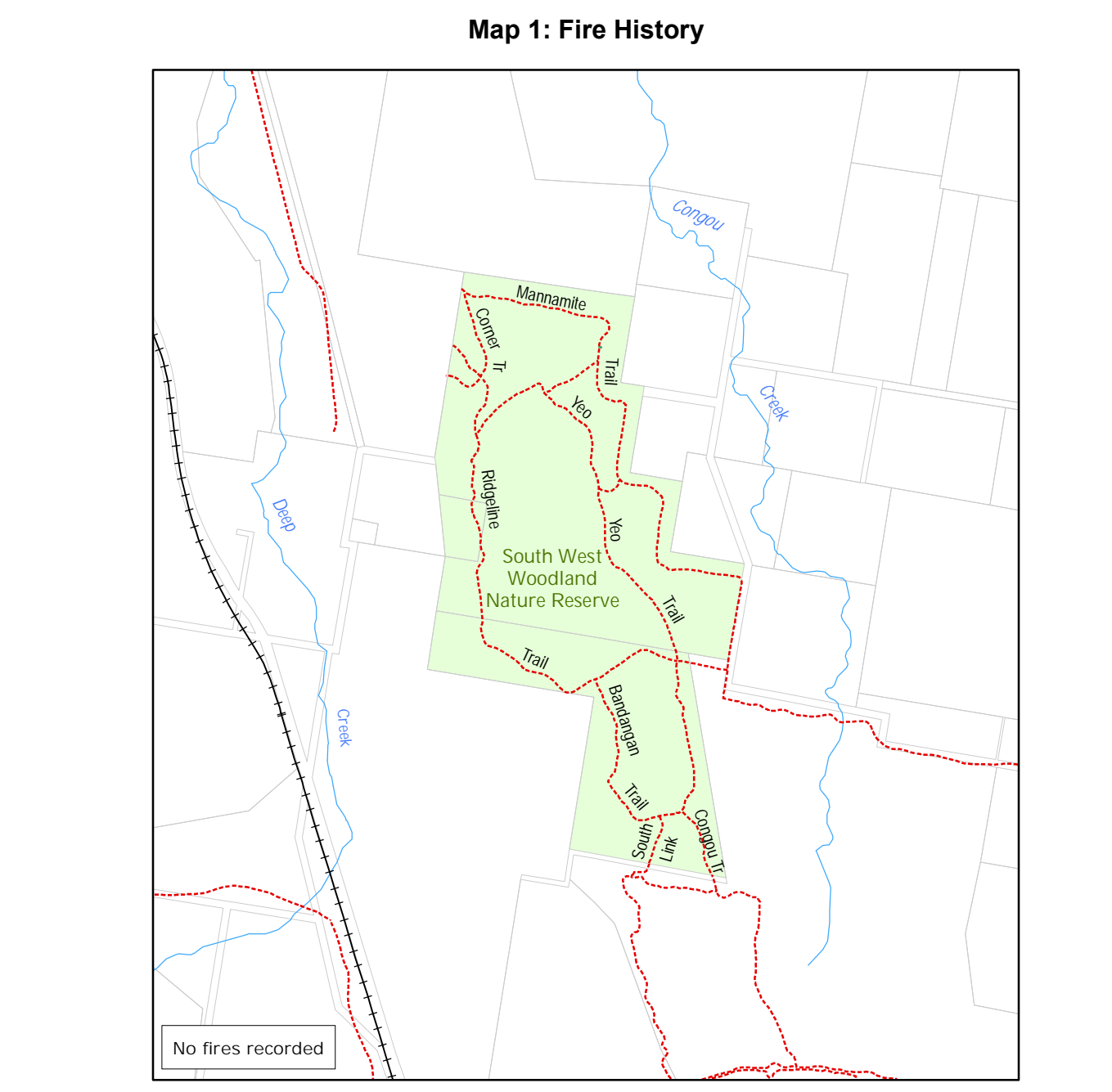
Southern Ranges Region South West Woodland Nature Reserve Yeo Yeo Precinct Fire Management Strategy 2016



Scale: Works Program map 1:5000, Location map 1:900000, other maps 1:25000
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This Map should be used in conjunction with air photos and ground reconnaissance during incidents and the development of incident action plans.

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MAP 1: FIRE HISTORY

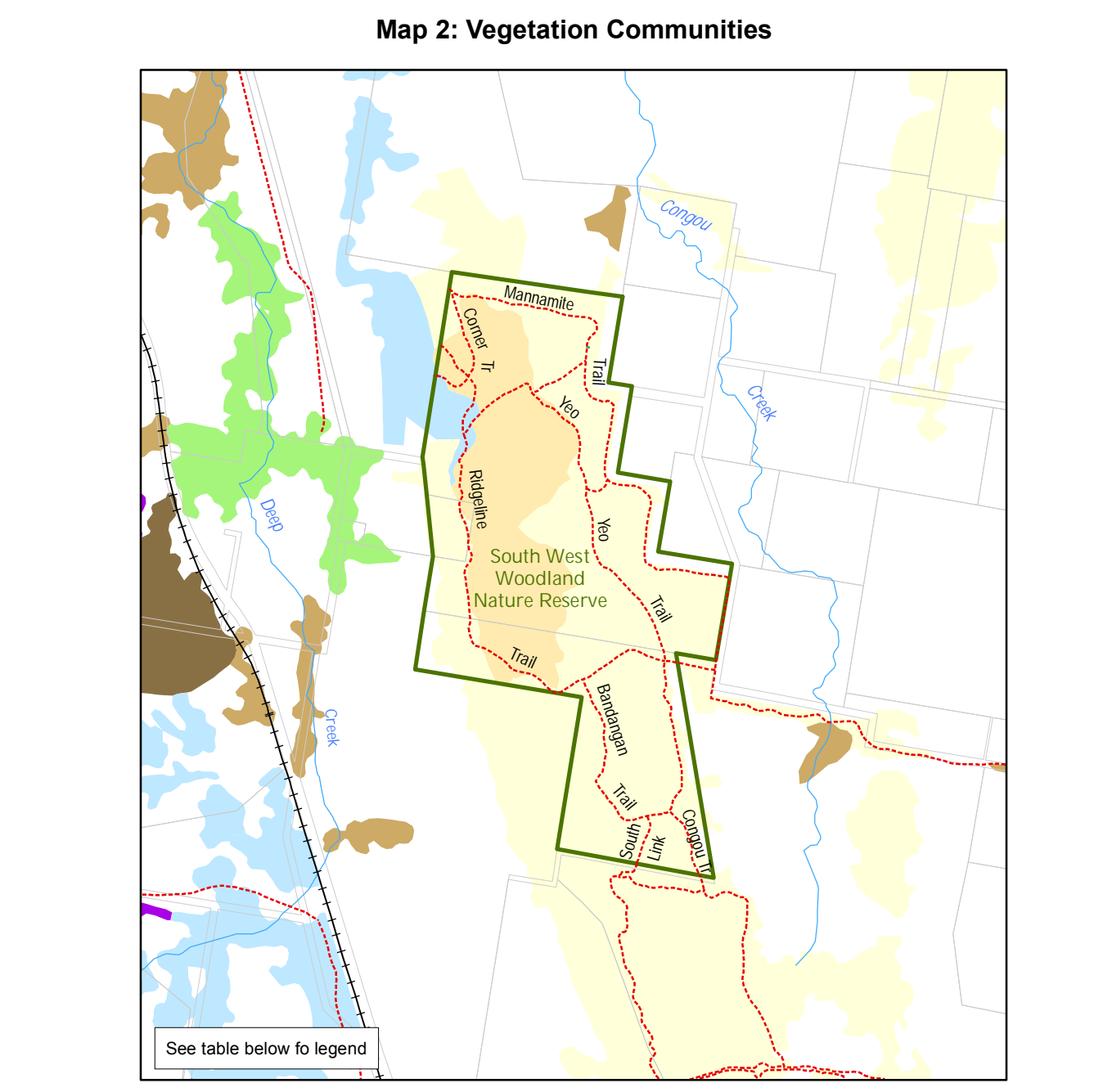
The pre-European fire history of the park is not well known. Traditional fire practices of Aboriginal people in NSW have not been well researched and are therefore poorly understood.

Ignitions There have been no recorded ignitions for the Reserve, in the records held by Office of Environment and Heritage (OEHL) or the previous managers, Forests NSW. Lightning strikes during dry electrical storms and escapes from rural burning have been a common cause of fires within the LGA. The majority of dry storms occur between November and February.

Prescribed Burns There have been no recorded prescribed burns for the Reserve, in the records held by OEHL or the previous managers, Forests NSW.

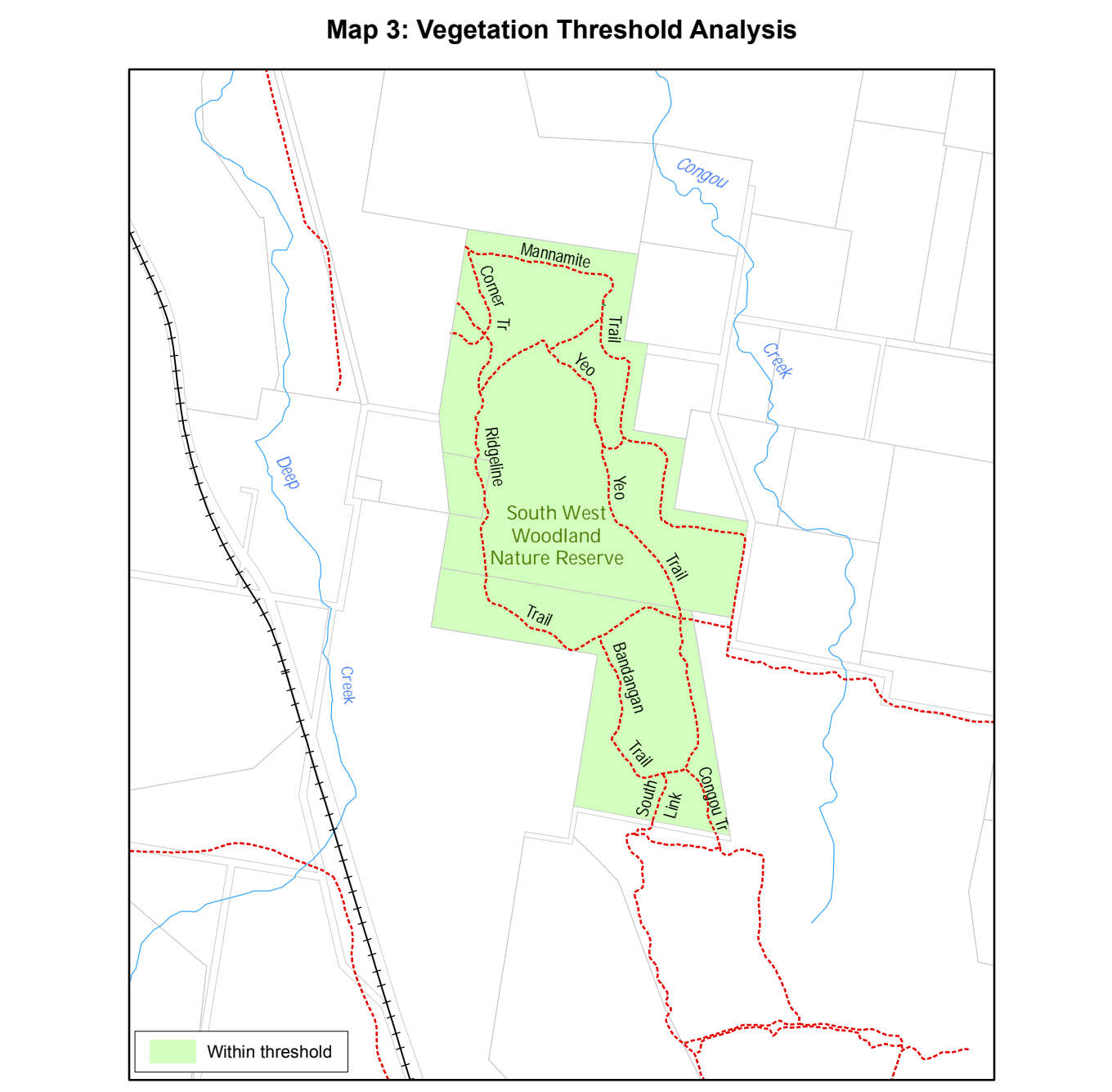
Wildfire Limited evidence of fire in the reserve. No records of wildfire within the Reserve and surrounding area.

Fire Frequency The incidence of fire for the Reserve and surrounding area is considered low.



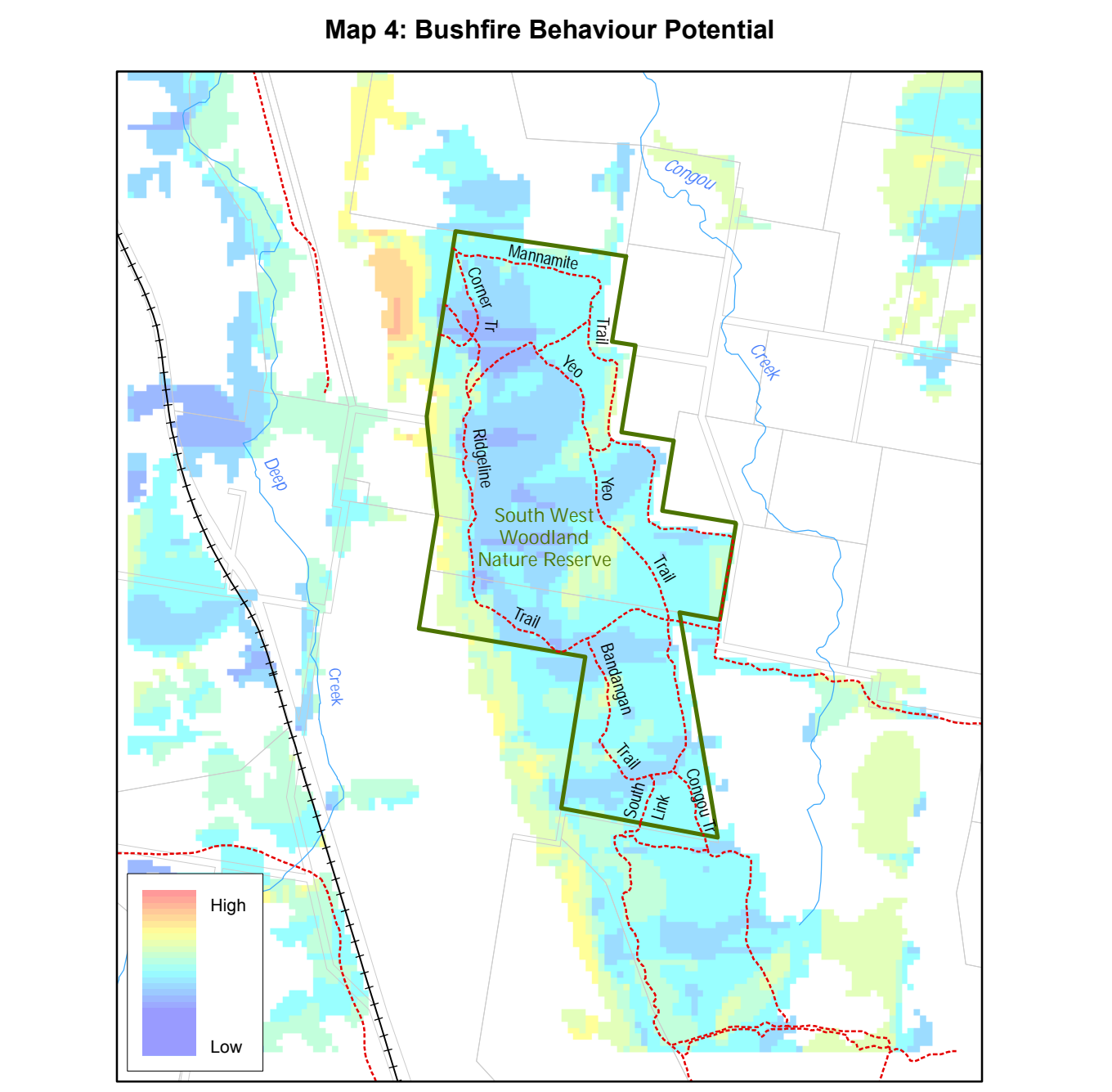
MAP 2: VEGETATION COMMUNITIES

Vegetation Formation (Keith, 2002)	Vegetation Community Description	NSW VCA ID	Reserve (GIS) Ha's	% Reserve Cover
Upper Rivierina Dry Sclerophyll Forests	Mugga Ironbark - mixed box woodland on hills in the Cowra - Boonwaa - Young region of the NSW South-western Slopes Bioregion	342	116.6	62.4
Western Slopes Grassy Woodlands	Blakely's Red Gum - White Box - Yellow Box - Black Cypress Pine box grass/shrub woodland on clay loam soils on undulating hills of central NSW South-western Slopes Bioregion	282	53.3	28.5
Western Slopes Dry Sclerophyll Forests	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South-western Slopes Bioregion	277	0	0
Western Slopes Dry Sclerophyll Forests	Blakely's Red Gum - Long-leaved Box - Norton's Box - Red Stringybark grass-shrub woodland on shallow soils on hills in the New South Wales South-western Slopes Bioregion	268	0	0
Western Slopes Dry Sclerophyll Forests	Red Stringybark - Long-leaved Box - Joycea pallida grassy open forest in the upper Lachlan catchment, NSW/SWS and South Eastern Highlands Bioregions	348	4.4	2.4
Inland Rocky Hill Woodlands	Doyers Red Gum - Black Cypress Pine - Currawang shrubby low woodland on rocky hills mainly in the NSW South-western Slopes Bioregion	186	0	0
Inland Rivierina Forests	River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes sub-region of the NSW South-western Slopes bioregion and western South East Highlands Bioregion	79	0	0
	Non Native Vegetation	1000	12.5	6.7



MAP 3: STATUS OF FIRE THRESHOLDS

Threshold	Vegetation Community	% of Reserve	Interpretation & Management Guidelines
Below Minimum Frequency Threshold	N/A	0	<ul style="list-style-type: none"> 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	Upper Rivierina Dry Sclerophyll Forests Western Slopes Grassy Woodlands Western Slopes Dry Sclerophyll Forests	100	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.

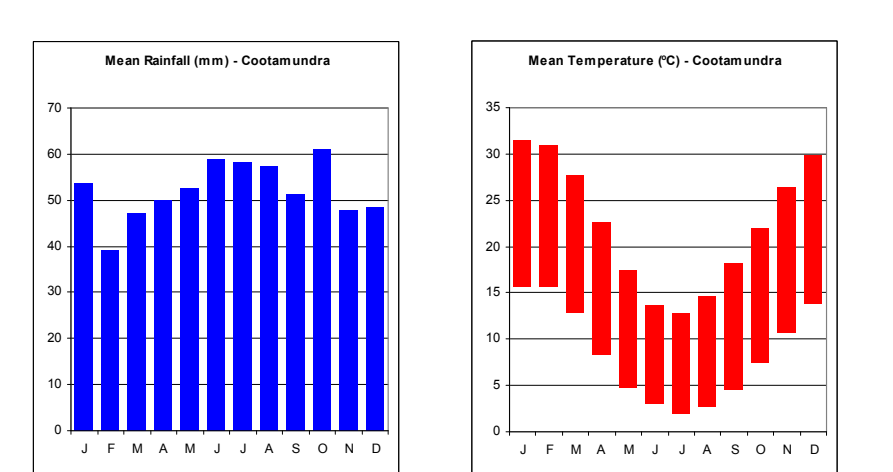
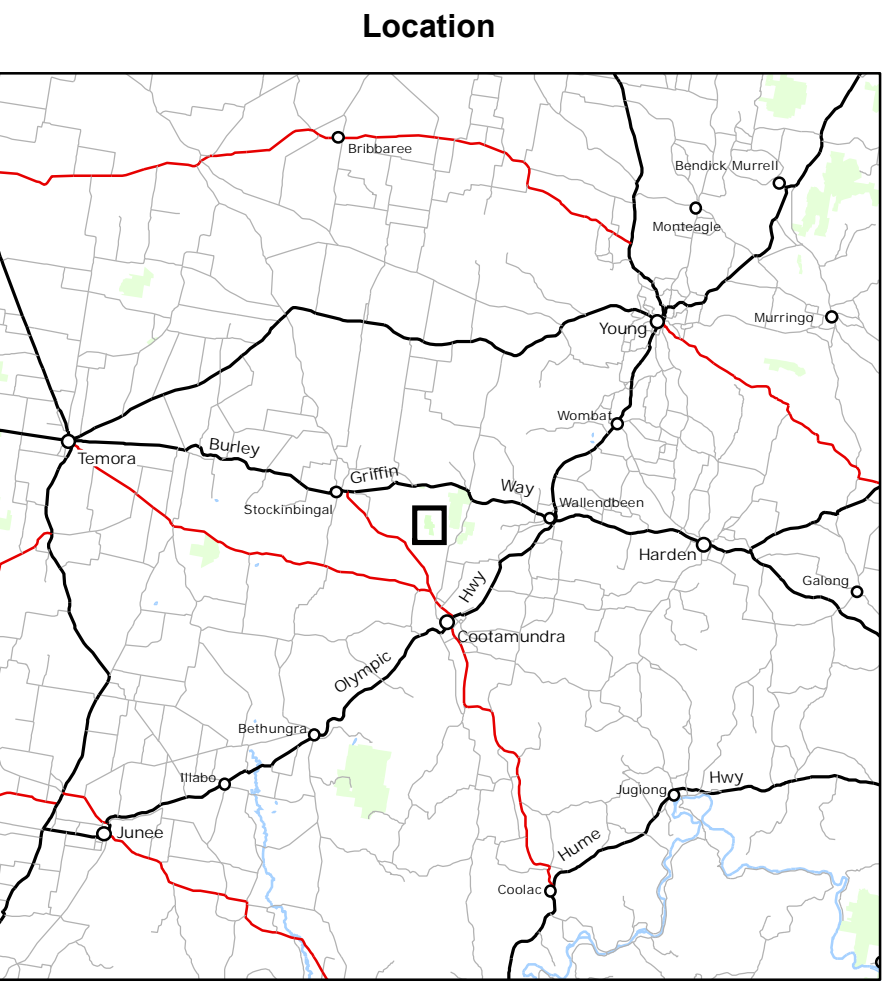


MAP 4: BUSHFIRE BEHAVIOUR POTENTIAL

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	N/A	N/A
Moderate	Blakely's Red Gum - White Box - Yellow Box - Black Cypress Pine box grass/shrub woodland	28.5
High	Mugga Ironbark - mixed box woodland	62.4
Very High	Red Stringybark - Long-leaved Box - Joycea pallida grassy open forest	2.4

Aspect Bushfire Behaviour		Slope Bushfire Behaviour	
Rating	Aspect in degrees	Rating	Slope in degrees
Low	80 - 200	Low	0 - 10°
Moderate	30 - 80 & 200 - 240	Moderate	10 - 20°
High	10 - 30 & 240 - 280	High	20 - 30°
Very High	280 - 10	Very High	>30°



Resource Information

South West Woodland Nature Reserve referred to in this plan as the Reserve was gazetted on the 1st January 2011 and comprises of 27 individual parcels of land that stretch from south of Hay to north west of Orange in NSW. This fire management strategy covers the land previously managed as Yeo Yeo State Forest (179 hectares), which is located approximately 11 km north of Coolamundra, between Deep and Congra Creeks, in NSW. For the purposes of this plan, this portion of the reserve system South West Woodland NPS (Yeo Yeo) will be referred to as the Reserve.

The Reserve straddles the northern part of the low lying Bendungan Hill, where the elevation ranges from 380 to 500 MASL. There are two drainage lines present within the Reserve, which are active during heavy rainfalls. This strategy has been prepared in accordance with the policies and procedures detailed in the NPWS Fire Management Manual and relevant legislation.

Office of Environment and Heritage	NSW National Parks and Wildlife Service, Parks and Wildlife Group, Southern Ranges Region, Murrumbidgee Area	Government Areas	Hume Federal Electorate Coolamundra State Electorate Coolamundra-Gundagai Regional Council
Rural Fire Service	South West Slopes Zone	Other Organisations	Young Local Aboriginal Land Councils Riverna Local Land Service

Yeo Yeo - PLANNING @ 10th AUGUST 2011

THREATENED FAUNA MANAGEMENT

Common Name	Scientific Name	TSC Schedule	Vulnerable Period													
			J	F	M	A	M	J	J	A	S	O	N	D		
Squirrel Glider	<i>Petaurus noroncoris</i>	V	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Spotted warbler	<i>Pyrholaemus sagittatus</i>	V	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Brown Treecreeper	<i>Climacteris picinnus</i>	V	/	/	/	/	/	/	/	/	/	/	/	/	/	/

- Threatened Fauna Guidelines**
- Minimise the size and intensity of wildfires, and manage to produce mosaic burn patterns. Fire patchiness is likely to be an important factor in providing a mosaic of structurally diverse vegetation.
 - If prescribed burns are necessary, avoid implementation during late winter through to the end of summer. 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 back burning operations.
 - Avoid damaging/felling hollow-bearing and known nest/treed 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 back burning. During mop up activities try to extinguish fire rather than falling tree when suitable.

Yeo Yeo - PLANNING @ JULY 2012

MAPS 2 and 5: SIGNIFICANT COMMUNITIES

Threatened Flora Management

In 2012 a list of 80 plant species were recorded from 5 sites within South West Woodland NPS. However there were no recordings of threatened flora. There is potential for species to occur in the reserve and I species are found they will be managed in accordance with the biodiversity fire thresholds for the vegetation community in which they occur.

MAP 5: CULTURAL HERITAGE

Key Guidelines

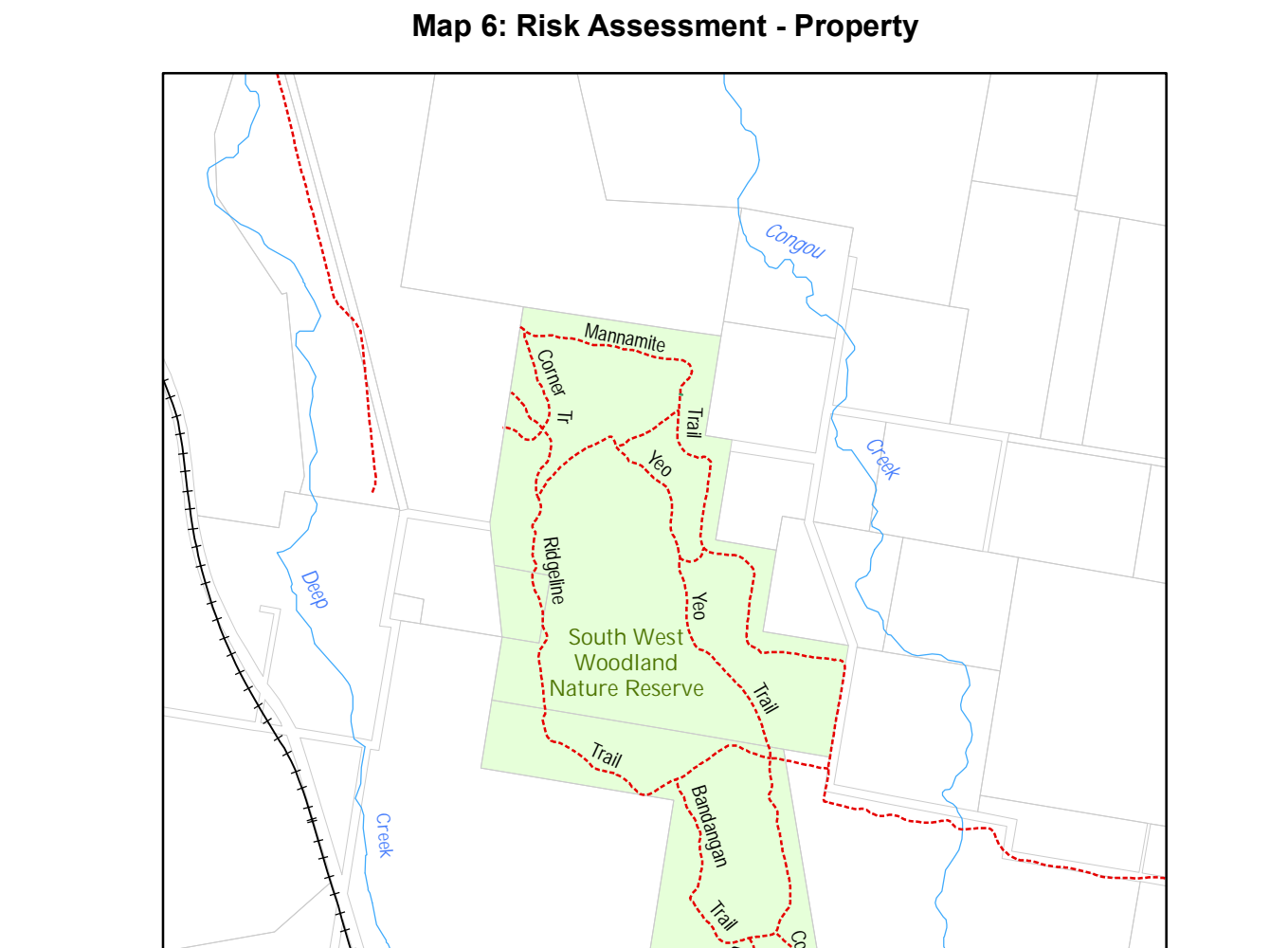
- OEHL Cultural Heritage Databases must be accessed during incidents and in planning for hazard reduction burning or other works to ensure new records are considered. Aboriginal site information from AHIMS is sensitive and subject to a Memorandum of Understanding. Site data must be used appropriately.

Aboriginal Cultural Heritage Site Management

- A thorough survey of Aboriginal cultural heritage has not been conducted within the Reserve. It is therefore not known with any certainty whether there are sites that can be damaged by fire. Unidentified sites may occur across the landscape, especially in riparian areas, along ridges and rock outcrops.
- During wildfire operations, efforts will be made to survey for Aboriginal sites ahead of earthmoving equipment where appropriate.
- Encourage survey of Aboriginal sites after fires when site visibility is increased.
- Inspect affected sites after wildfire and apply erosion works where necessary.

Historic Heritage Management

There are no recorded sites of significance within the Reserve.



MAP 3: VEGETATION COMMUNITY THRESHOLDS

Vegetation Formation	Vegetation Community Description	Minimum Fire Interval	Maximum Fire Interval	Fire History Evaluation	Guidelines
Western Slopes Grassy Woodlands	Blakely's Red Gum - Yellow box grassy tall woodland	5	40	100% within threshold	<ul style="list-style-type: none"> 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.
Upper Rivierina Dry Sclerophyll Forests	Mugga Ironbark - mixed box woodland	5	50	100% within threshold	<ul style="list-style-type: none"> As above
Western Slopes Dry Sclerophyll Forests	Red Stringybark - Long leaved box - Joycea Pallida grassy open forest	5	50	100% within threshold	<ul style="list-style-type: none"> As above

Note: 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 plant vital attributes, and including compatibility of known flora requirements, for identified broad vegetation formations (Kenny et al. 2004). Vegetation communities as outlined 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 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.

ANALYSIS OF BUSHFIRE BEHAVIOUR POTENTIAL

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 content).
- 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 west.

- References**
- Bushfire Coordinating Committee (2007). BECC Policy 207 - Fire Trails. NSW Rural Fire Service.
 - Keath, D.A. 2002. A compilation map of native vegetation for New South Wales. Biodiversity Strategy. NSW Government.
 - Kenny et al. 2004. Guidelines for Ecologically Sustainable Fire Management. 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 Environment, Melbourne, Victoria.
 - RFS. Standards for Asset Protection Zones. NSW Rural Fire Service document.
 - NPWS. 2013/14. NPWS Fire Management Manual. Office of Environment and Heritage, NSW.
 - NPWS. 2007. State Incident Plan. Department of Environment and Conservation, NSW.

- SUMMARY GUIDELINES FOR THE PROTECTION OF NATURAL HERITAGE**
- Minimise size and intensity of wildfires, and manage to produce mosaic burn patterns.
 - 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/treed trees when establishing control lines, mopping up and during prescribed burning. During mop up activities try to extinguish fire rather than falling tree where suitable. If habitat trees are located on control lines remove fuel from base of tree, prior to prescribed burning or backburning.
 - Avoid the use of fire suppression chemicals within 100m of streams and riparian environments.

MAP 8: FUELS AND FIRE BEHAVIOUR

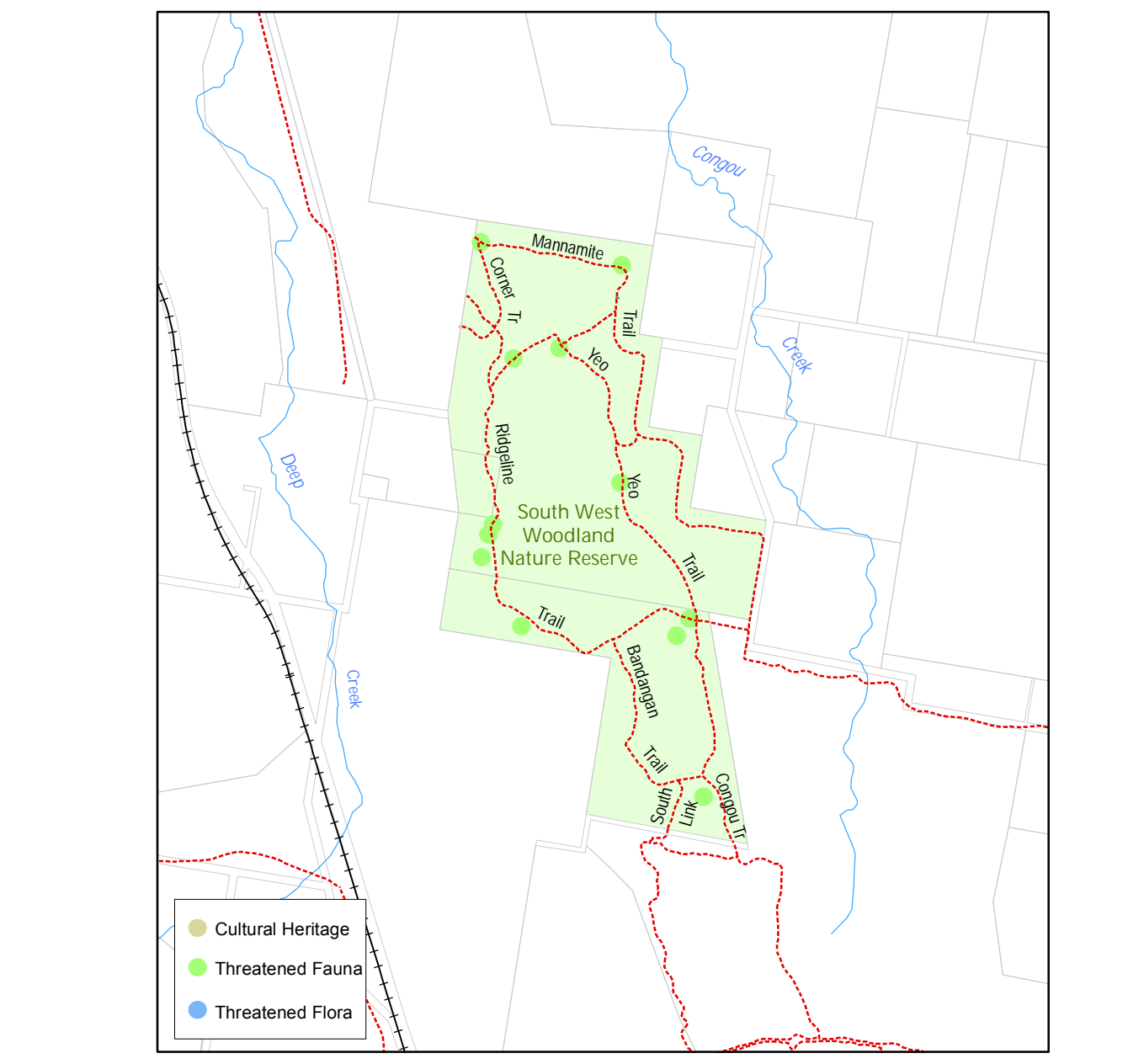
Fuel Landscape Analysis

Fuels are variable across the Reserve reflecting complex interactions between vegetation type, aspect and topography. Fuel sampling sites were established in April 2014 at 4 sites throughout the Reserve. The assessment approach applied was to determine the Overall Fuel Hazard (OFH) Rating (McCarthy et al., 1999). Rather than only considering surface fine fuel loads (FFL), this assessment shifts the emphasis to considering the whole fuel complex, 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. The major findings of the fuel sampling program were:

- The Overall Fuel Hazard rating were three Low and one Medium as shown on Map 8.
- There were no sites that were classified as having high or very high overall fuel hazard rating.

If an area is within biodiversity threshold, identified to have high fuel loads, and there is a risk to life and property, temporary fuel monitoring sites will be located within that area for determination of whether a prescribed burn is suitable. Management options would be discussed with the RFS.

Map 5: Risk Assessment - Cultural & Natural



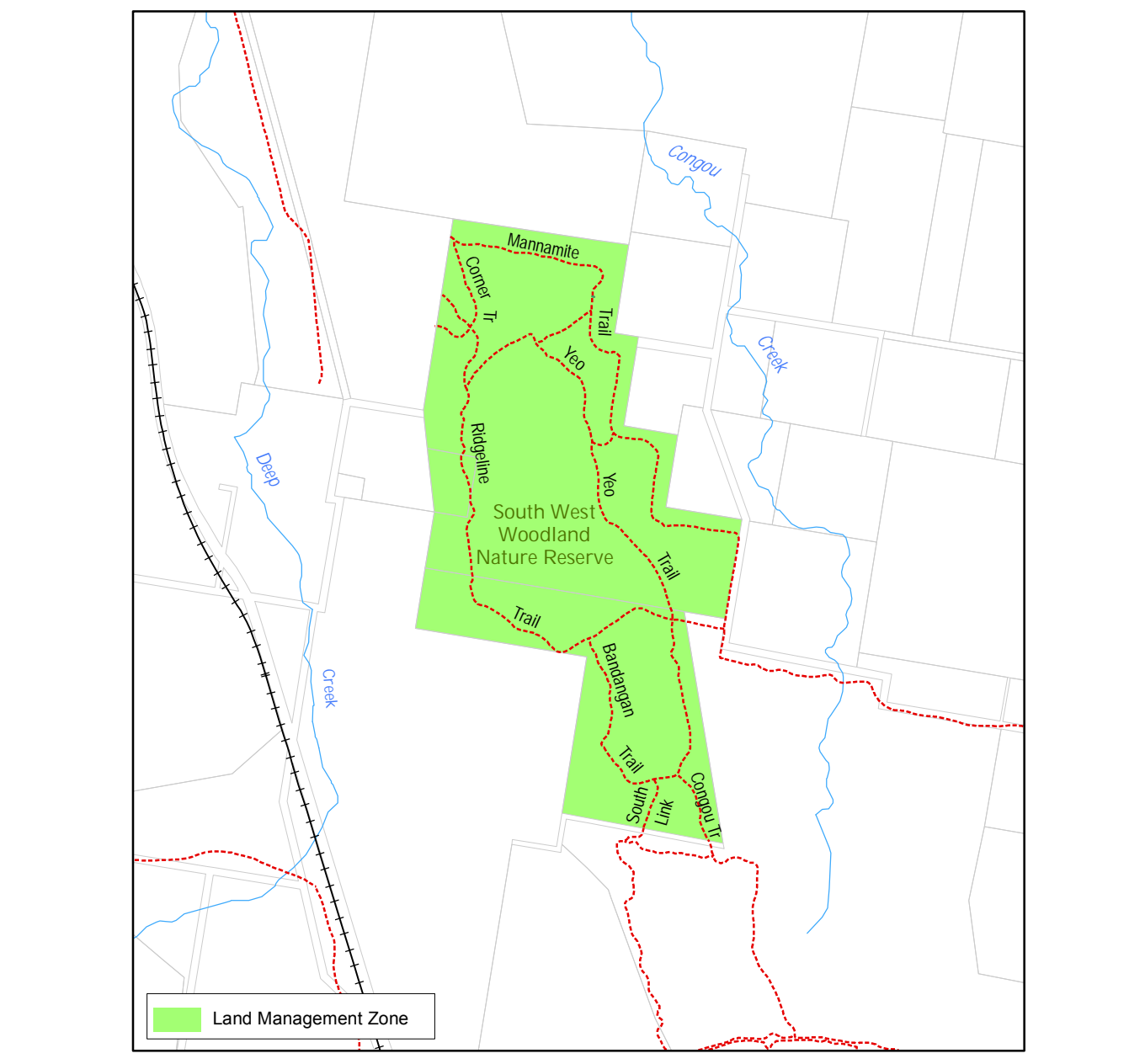
MAP 7: BUSH FIRE MANAGEMENT ZONES - DEFINITIONS

Asset Protection Zone (APZ)	The purpose of APZ is to protect human life, property and highly valued public assets and values. Provide fuel reduced areas around assets.
Strategic Fire Advantage Zone (SFAZ)	To provide strategic areas of fire protection advantage which will reduce the speed and intensity of bushfires, reduce the potential for spot fire development, and aid containment of bushfires to existing management boundaries.
Land Management Zone (LMZ)	The objectives 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.

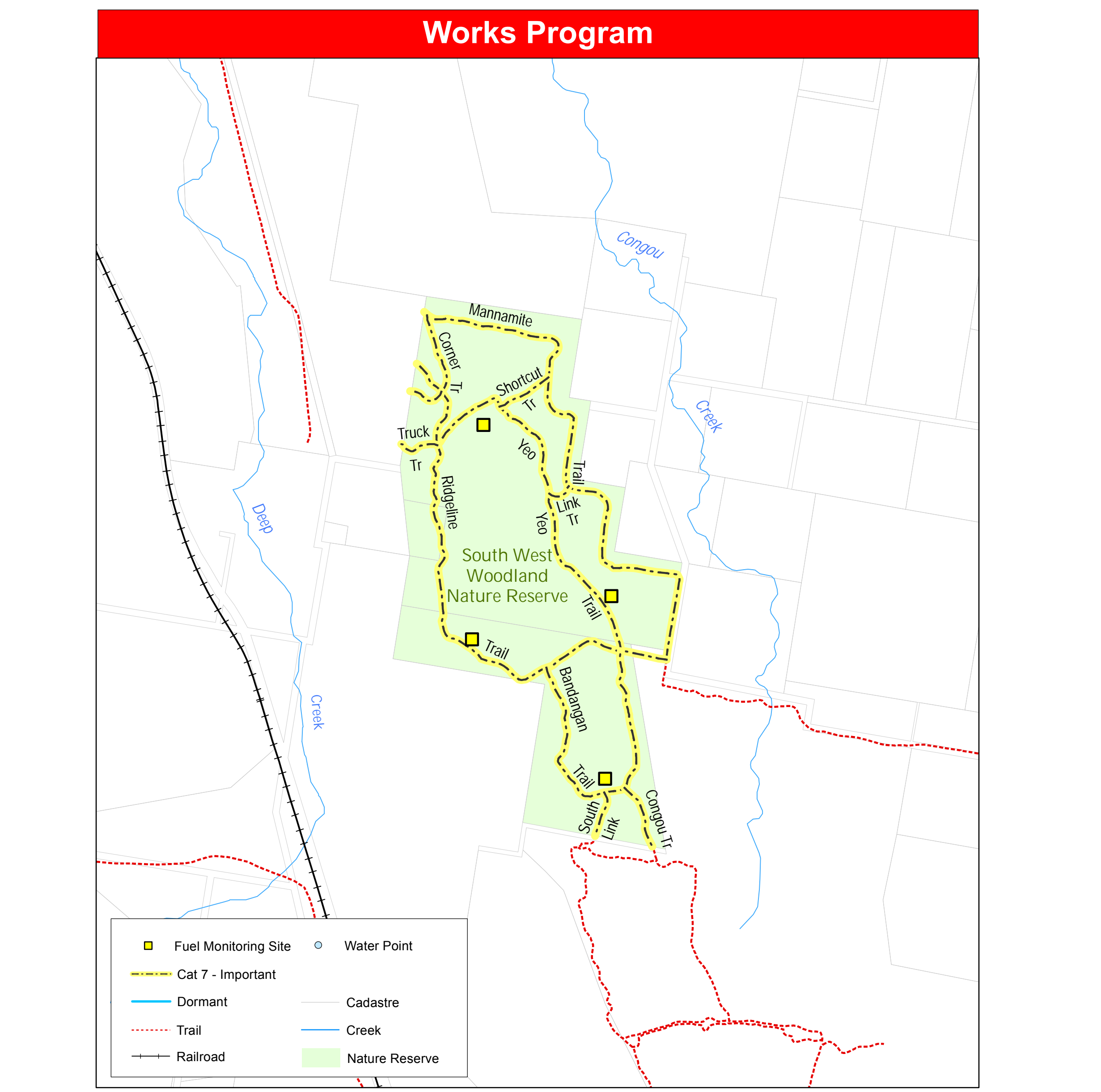
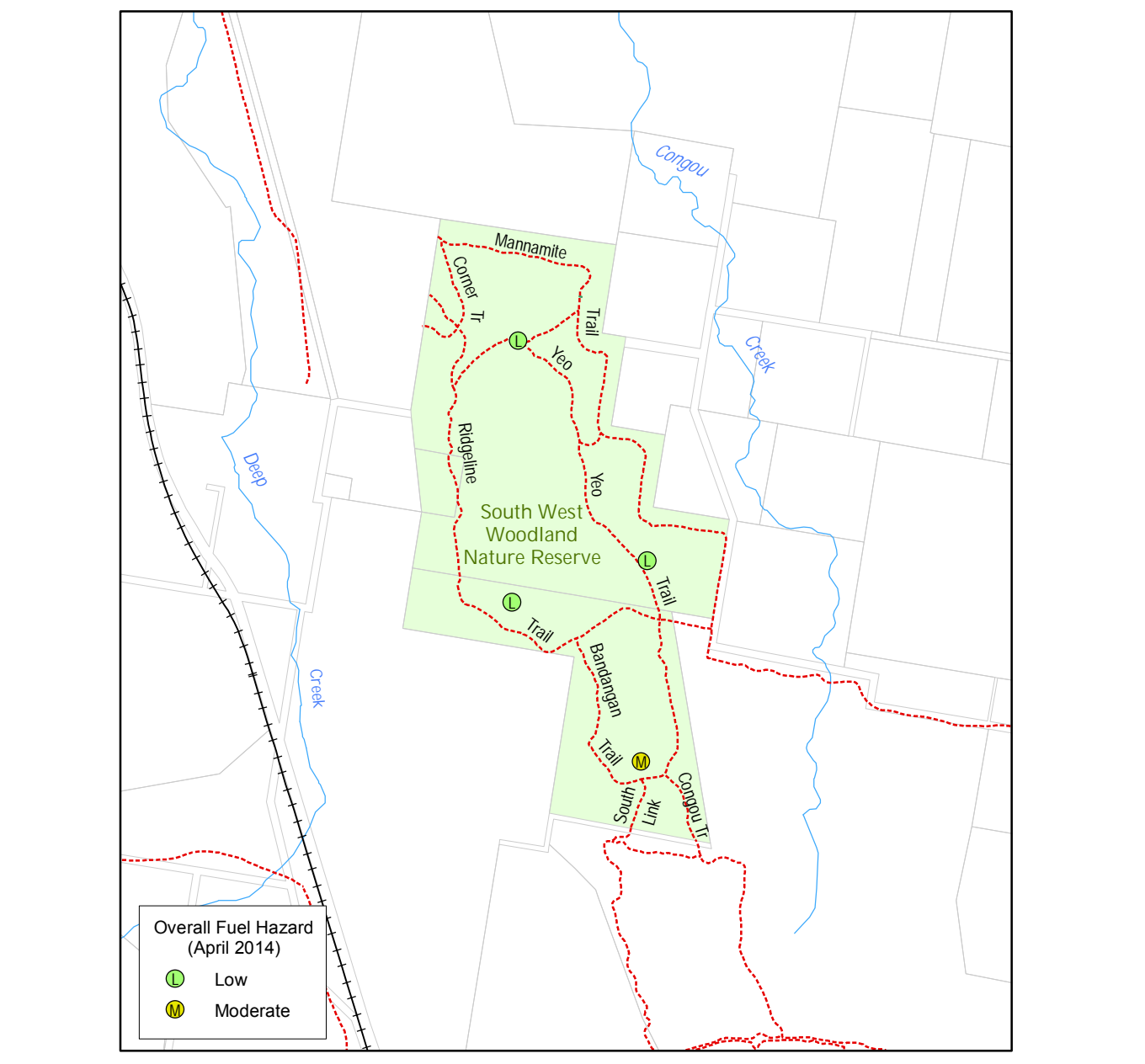
RESERVE BUSH FIRE MANAGEMENT ZONES

Zone	Guidelines	Actions
LMZ	<ul style="list-style-type: none"> Minimise size and intensity of wildfires, and manage to produce a mosaic burn pattern, where weather conditions permit. Earthmoving equipment may be used to contain fire within OEHL policy guidelines. Attempts can be made to increase burn patchiness by use of incinerators, retardant, water bombing etc. Protect mature trees and minimise felling large and hollow bearing trees during mop up activities. 	<ul style="list-style-type: none"> Areas should be monitored to determine threats to biodiversity and managed in accordance with conservation policy and principles. Prescribed fire may be applied in these areas if appropriate for ecological purposes or protection of cultural heritage.

Map 7: Bushfire Management Zones



Map 8: Fuels & Fire Behaviour



WORKS PROGRAM

Asset	Priority	Name, Area or Detail	Management Strategy	Proposed Works
Trails	High	Management Trails	<ul style="list-style-type: none"> Maintain trail network for vehicle category identified in the fire trails register. All trails to be clearly signposted at intersections and trailheads. 	<ul style="list-style-type: none"> Assess trails annually and maintain as required or as specified in Regional Operations Program. Maintain directional signage throughout fire trail network as required. Chemical and mechanical fuel reduction of management trails as required. Burning of windrows
	Low	Dormant Trails	<ul style="list-style-type: none"> Could be used during emergencies once upgraded to Cat 9 standard. May be re-opened as a control line option. 	<ul style="list-style-type: none"> Assess trails and document condition and suitability for fire suppression activities, every 5 years.
LMZ (Map 7)	Medium	General landscape, natural and cultural conservation values	<ul style="list-style-type: none"> Manage and protect natural & cultural values with appropriate fire management regimes. 	<ul style="list-style-type: none"> Monitor thresholds every 5 years, and after fire events.
	High	Fuel monitoring	<ul style="list-style-type: none"> Establish fuel monitoring sites and conduct regular surveys. 	<ul style="list-style-type: none"> Conduct assessments every 5 years.
Information & Research	High	Mapping fire	<ul style="list-style-type: none"> Map all bushfires and prescribed burns to enable data collection on fire frequency, intensity, rate of spread and area burnt. 	<ul style="list-style-type: none"> Map the extent, patchiness and intensity, where possible, of all bushfires and prescribed burns. Incorporate data into fire management and incident databases.
	Low	Research	<ul style="list-style-type: none"> Liaise with academic and research institutions to encourage research in the Park relevant to fire management. 	<ul style="list-style-type: none"> Ongoing
Cooperative Fire Management	High	Liaise with NSW RFS, and Neighbours	<ul style="list-style-type: none"> Attend meetings with the NSW RFS Bushfire Management Committee, RFS volunteer brigades. Undertake joint training exercises. 	<ul style="list-style-type: none"> Ongoing