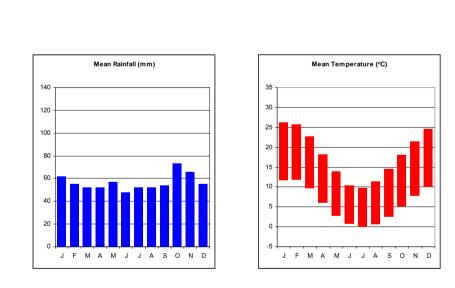
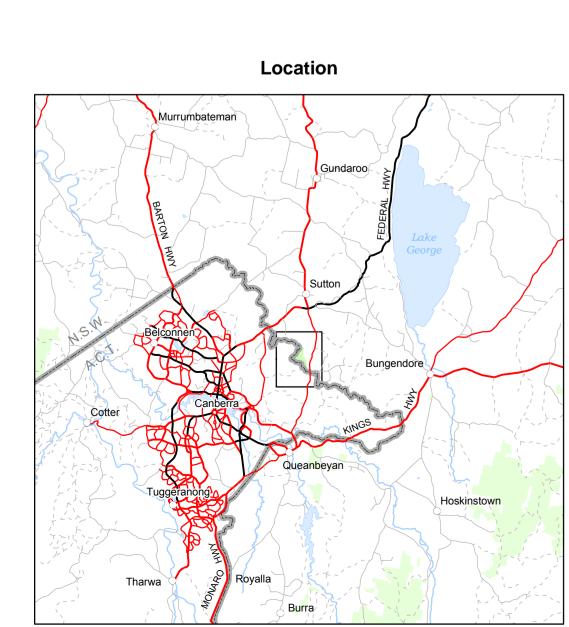


Ignitions	There are no available records of ignitions within the reserve.
Prescribed burns	There are no available records that indicate prescribed or hazard reduction burns have been conducted in this reserve or surrounding landscape by previous land managers. The NPWS have not initiated any prescribed burns since gazettal.
Wildfire	In March 1985 a fire was started by arson at Mt Majura, approximately 6 km west of the reserve. This fire burnt through the reserve, jumped Sutton Rd and continued eastwards for a further 6 km, burning a total of 5,623 ha. Other smaller fires in November 1982, November 1984, and February 1985, came within a few km's of the reserve They were all started by arson. A very large (16,264 ha) fire burnt to within 2 km of the reserve in February 1979.
Fire Frequency	The reserve has had one fire event in 24 years (as at 2009). The frequency and interval between fire has importan implications for biodiversity and future fire management.

	ture Reserve (266 ha) was gazetted on the 6 <sup>th</sup> ture Reserve will be referred to as the "reserve		
beside the Majura in 2009 did not fir access off forme conducted on exi	a Field Firing Range managed by the Departm nd evidence of high explosive ordnance within ad trails in the reserve is permitted for this n	ent of Defence. Fie the reserve, howeve eason. All ground fi	to the eastern Australian Capital Territory border, ild survey of the Reserve for unexploded ordnancer one live item was identified and therefore <b>no</b> ire fighting and suppression efforts should be ling for Fire Management and Suppression has
Department of Environment and Climate Change	Parks and Wildlife Division, National Parks and Wildlife Service. South West Slopes Region, Queanbeyan Area	Government Areas	Hume Federal Electorate. Monaro State Electorate. Palerang Local Government Area
Rural Fire Service	Lake George Zone (Bush Fire Management Committee)	Other Agencies	Ngunawal Aboriginal Land Council Murrumbidgee Catchment Management Authority Department of Defence.





## Map 2: Fire History - Prescribed Burns Greenwood Hill 871 Goornoyarroo Nature Reserve

		MAP	6: THREATENED FA	UNA	
Fire Group	Common Name				Vulnerable Period
	Brown treecreeper		Climacteris picumnus	V	May-Dec
	Diamond fire	etail	Stagonopleura guttata	V	Aug-Jan
Α	Hooded rob	in	Melanodryas cucullata	V	Jul-Nov
^	Speckled wa	arbler	Pyrrholaemus sagittatus	V	Aug-Dec
	Regent hone	ey-eater	Xanthomyza phrygia	V	Aug-Jan
	Painted hon	ey-eater	Grantiella picta	V	Aug-Feb
В	Species occ	curring in riparian, wat	er courses and swamp areas		
Fire Group	Veg Groups		Threatened Fauna Guidelines &	Considerations	
Α	□ <b>G</b> 04	Fire often leads to a decline in insect abundance and diversity, which some species are dependent on. Felling hollow bearing trees (including dead and down trees) during 'mopping up' activities decreases nes hollow availability for most species in this group. These species are likely to be disadvantaged by frequent fuel reduction fire because of the simplification of forest structure. The least likely period species would be vulnerable to fire is March.  Where possible;  Wildfires should be kept to the smallest possible size, managed to reduce intensity and create long term mosaic patterns. Ensure patches of shrubs, standing and fallen timbers are left in tact and protect hollow bearing trees (dead or living), particularly during mo up activities.  Minimise the use of earthmoving equipment in the construction of new trails or control lines gully communities to prevent further habitat fragmentation, especially in LMZ1.			
В	Streams, swamps & Riparian Areas	All areas of vegetation by swamps, streams, dams & riparian areas. Species can often be found unde debris. Fire and destabilisation of soil resulting from frequent fire can lead to increased runoff into streams and waterways, sedimentation and eutrophication, potentially impæting on species. High intensity fire can remove riparian vegetation, reducing the filtering benefits of vegetation. Loss of nutrifrom the site can affect water quality and may lead to algal blooms. Frequent prescribed burning is expected to have severe impacts on these habitats.  Where possible;  Minimise frequent and potential for high intensity fires and keep fire at least 50m from swamps, streams & riparian areas.  Minimise the use of fire suppression chemicals and earthmoving within 50m of streams swamps & riparian environments.			un-off into ies. High Loss of nutrient burning is swamps,

MAP 6: CULTURAL HERITAGE					
Key Guidelines					
<ul> <li>DECC Databases, Factors for prescrib AHIMS is sensitive appropriately.</li> <li>For prescribed burn program outlines.</li> </ul>	ntified sites must be protected.  AHIMS and HHIMS, must be accessed during incidents and or for preparation of Review of Environmental bed burning or other works programs to ensure new records are included. Aboriginal site information from and subject to a Memorandum of Understanding. Site data must respect this agreement and must be used sing programs, protection measures will be outlined in the Review of Environmental Factors and burning ined officers will provide advice on site protection methods.				
Aboriginal Heritage	<ul> <li>□ The reserve requires a cultural heritage survey to locate sites; however this may not be possible due to unexploded ordinance within the reserve.</li> <li>□ Potential site locations include artefacts, scar or carved trees, special places etc.</li> <li>□ During wildfire operations, efforts will be made to survey for Aboriginal sites ahead of earthmoving equipment.</li> </ul>				
Historic Heritage	<ul> <li>□ The reserve requires a cultural heritage survey to locate sites; however this may not be possible due to unexploded ordinance.</li> <li>□ Potential site locations include ruins, fence lines, equipment from grazing e ra and army relics etc.</li> <li>□ Where possible, operational guidelines should be followed at all times.</li> </ul>				
Note: Cultural heritag	pe sites are based on data recorded on AHIMS and HHIMS databases and field data recorded as at April 2009.				

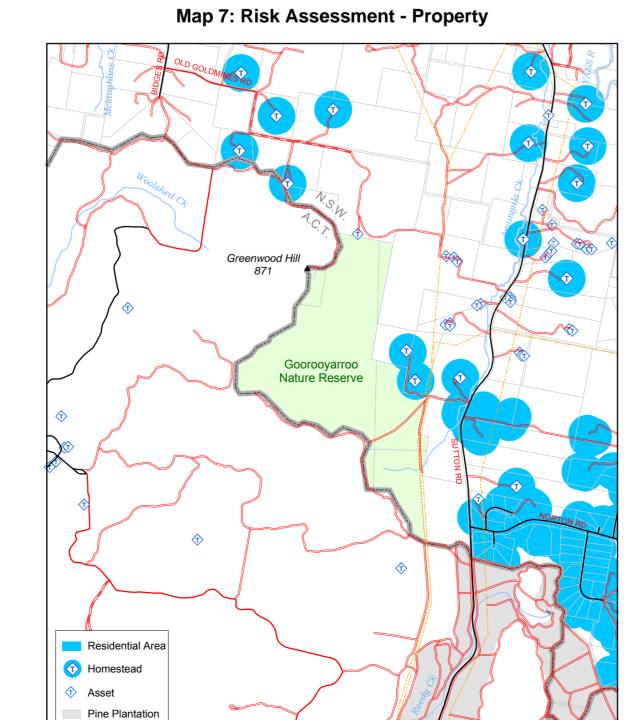
## Map 6: Risk Assessment - Cultural & Natural

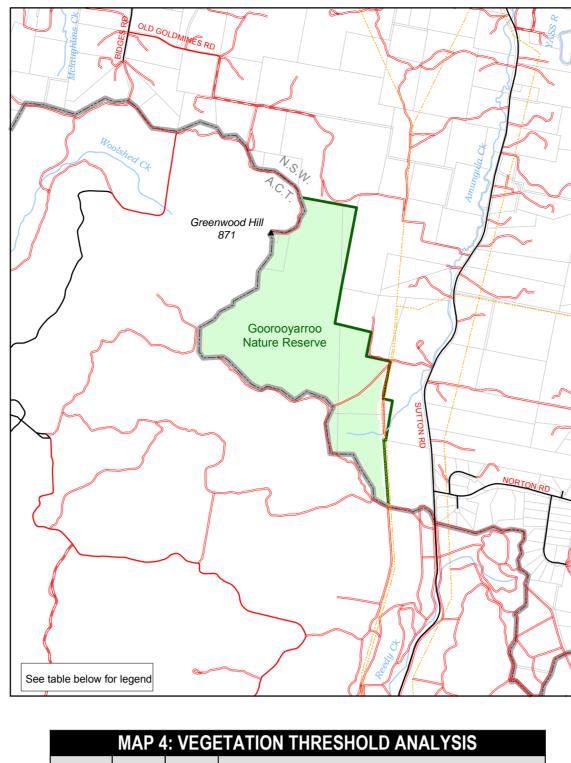
## Map 3: Vegetation Communities Greenwood Hill 871 Goorooyarroo Nature Reserve

W	AP 3: VEGE	TATION CO	MMUNITIES & THRESH	OLDS
Veg Group	Vegetation Descr	iption		% of Rese
G01	Cleared or Partly C	Cleared		3.8
G02	Cold, Moist Tablela	and Gum Complex (Snow	Gum)	7.4
G03	Dry Tableland and	Escarpment Box/Red Gun	n Complex	9.9
G04	Dry Tableland and	Escarpment Gum/Stringyt	park Complex	78.8
GEx	Pine Plantation			0
				t March 2000.
Fire	Vegetation class	Vegetation Group	Vegetation Management Guid	
Fire Interval	Vegetation class  Sclerophyll grass dry woodland	Vegetation Group  Dry Tableland and Escarpment Box/Red Gum Complex	Vegetation Management Guid  Extinctions predicted if fire is frequent (<10 year infrequent (>40 years apart). This community copercentage of the reserve and contains key spesurvival of threatened fauna.  Where possible;  Avoid the potential for frequent fire, where support of the potential for frequent fire for fire	rs apart) and overs a small cies supporti

Fire Interval	Vegetation class	Vegetation Group	Vegetation Management Guidelines
10 - 40	Sclerophyll grass dry woodland	Dry Tableland and Escarpment Box/Red Gum Complex G03	Extinctions predicted if fire is frequent (<10 years apart) and infrequent (>40 years apart). This community covers a small percentage of the reserve and contains key species supporting the survival of threatened fauna.  Where possible;  Avoid the potential for frequent fire, where successive fires occur <10 years apart.  High intensity fires should be avoided.  Occasional intervals greater than 15 years may be desirable (NPWS, 2004).
7 - 30	Shrubby dry sclerophyll forest	Dry Tableland and Escarpment Gum/Stringybark Complex	<ul> <li>□ Some intervals in the higher end of the range, i.e. 25 years, may be desirable (NPWS, 2004).</li> <li>□ A decline in biodiversity is predicted if 3 or more consecutive fires occur with inter-fire intervals of &lt; 7 years.</li> </ul>
10 - 50	Semi-mesic grassy forest	Cold, Moist Tableland Gum Complex (Snow Gum)	Frequent fire will cause extinctions within these vegetation communities. Declines predicted if successive fires occur <10 years apart or where fire is excluded for long periods (>50 years) in the over-storey. Mid and ground cover species may decline if fires occur >50 years apart. Cold tableland communities are at risk of simplification and or loss through inappropriate fire regimes.  Where possible;  Minimise the size and intensity of any fire, especially where successive fires occur <10 years apart.  Avoid felling mature and hollow bearing trees.
Note: Flora	and Fauna management	t guidelines should be cons	ulted in conjunction with vegetation management guidelines.

MAP 7: RISK ASSESSMENT - LIFE & PROPERTY			
Asset	Vulnerability & Impacts	Risk Mitigation	
Reserve Assets	☐ There are no identified reserve assets.	Provide guidelines in the event assets are constructed within the reserve.	
Other assets (including private property or other lands adjacent to the reserve)	☐ Property assets may be damaged by fire escaping the reserve	Maintain access trails within the reserve that will assist in fire fighting efforts.      Participate in fire management proposals through RFS Zone Bush Fire Management Committee meetings.      During the fire season rapidly respond to all unplanned fires to minimise potential spread to private lands.	

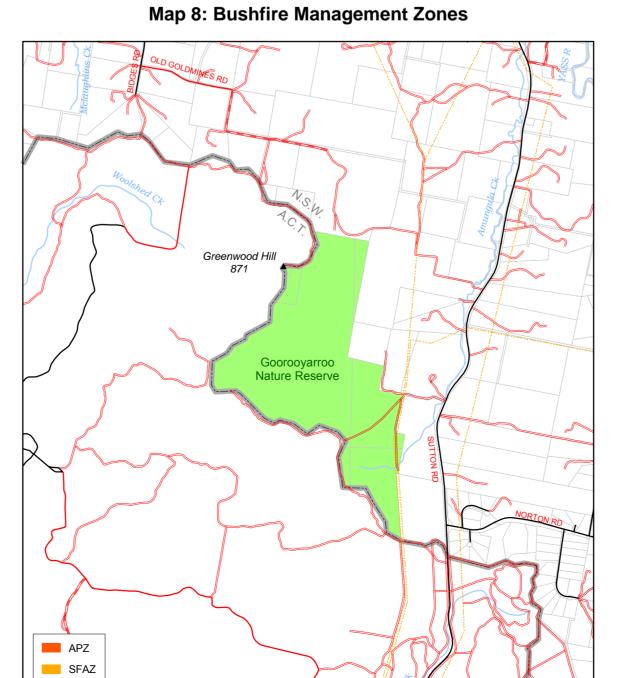




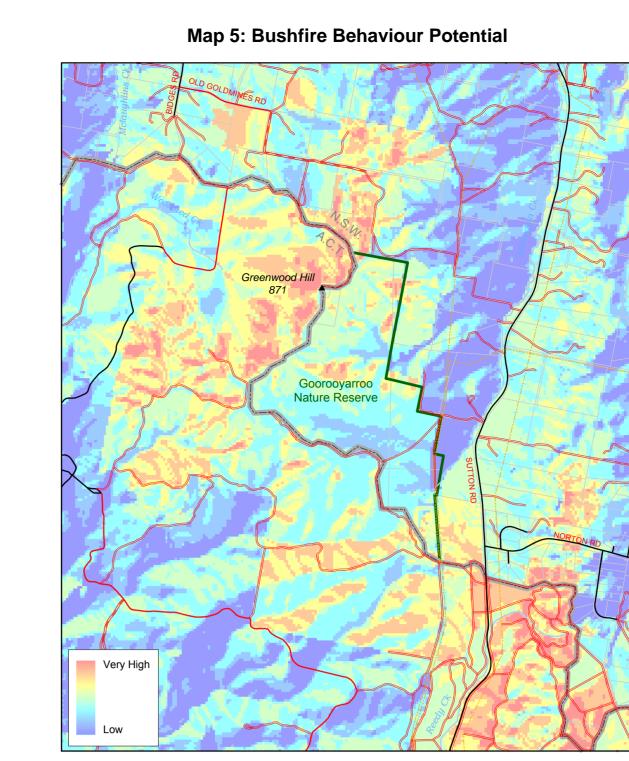
Map 4: Vegetation Threshold Analysis

	MAP 4	: VEGE	TATION THRESHOLD ANALYSIS
Threshold	Vegetation Group	% of Reserve	Interpretation & Management Guidelines
Overburnt	N/A	0	<ul> <li>□ According to the vegetation regime thresholds, two consecutive fires have been recorded too close together and the area is overburnt.</li> <li>□ Additional fire in this area will lead to adverse fire regimes and may threaten community biodiversity.</li> </ul>
Vulnerable	N/A	0	<ul> <li>□ Will be overburnt if the area burns before the end of 2009.</li> <li>□ Fire should be avoided for this year and until another analysis of thresholds is modelled to reassess threats.</li> </ul>
Recently burnt	G02, G04	0	<ul> <li>□ Time since fire is less than the threshold intervals, but veg group G04 will be considered OK after 2009 if the area doesn't burn.</li> <li>□ Fire this year will push this vegetation into the vulnerable class.</li> <li>□ Fire should be avoided for this year, but could be assessed for proposed burning or other prescribed burning program for the following year.</li> </ul>
Underburnt	N/A	0	□ May require fire after 2009 for Asset protection, strategic or biodiversity reasons.     □ Planned fire may be introduced for fuel reduction burning for asset and strategic protection programs, ecological purposes and unplanned fire events may be allowed to burn if     □ The vegetation community demonstrates a loss of biodiversity     □ conditions are suitable     □ the intensity meets vegetation, flora and fauna community requirements     ○ >50% of any vegetation community group in any threshold across the reserve is classed as Ok, Almost Underburnt and Underburnt.
Almost Underburnt	N/A	0	□ Planned fire may be introduced for fuel reduction burning for asset or strategic protection programs and unplanned fire events may be allowed to burn if  The vegetation community demonstrates a loss of biodiversity conditions are suitable  the intensity meets vegetation, flora and fauna community requirements >50% of any vegetation community group in any threshold across the reserve is classed as Ok.
ок	G03	96	<ul> <li>□ Areas which thresholds have been assigned to, which don't fall into one of the above categories.</li> <li>□ Fire is neither required or to be avoided.</li> <li>□ Fire should only be applied in areas if a loss of biodiversity is demonstrated.</li> <li>□ Where possible, maintain &gt;50% of any vegetation community group across the reserve as Ok, Almost Underburnt and Underburnt.</li> </ul>
Unknown/ No Regime Assigned	G01	4	<ul> <li>□ The fire history is too short to determine whether it is underburnt or over burnt.</li> <li>□ Areas that do not have a threshold assigned to them or there is missing data, limiting the modelling capabilities in DECC GIS.</li> </ul>
intervals). Sor vulnerable thre	me vegetation o eshold. All veg	communities metation commu	n vegetation community thresholds and recorded fire history (including fire frequency and ay have "No Fire' regimes applied, due to sensitivity to fire and may be represented in the nities should be monitored and planned fire should only be applied if a loss of biodiversity eserve, the analysis would have to be performed again to establish new threshold values.

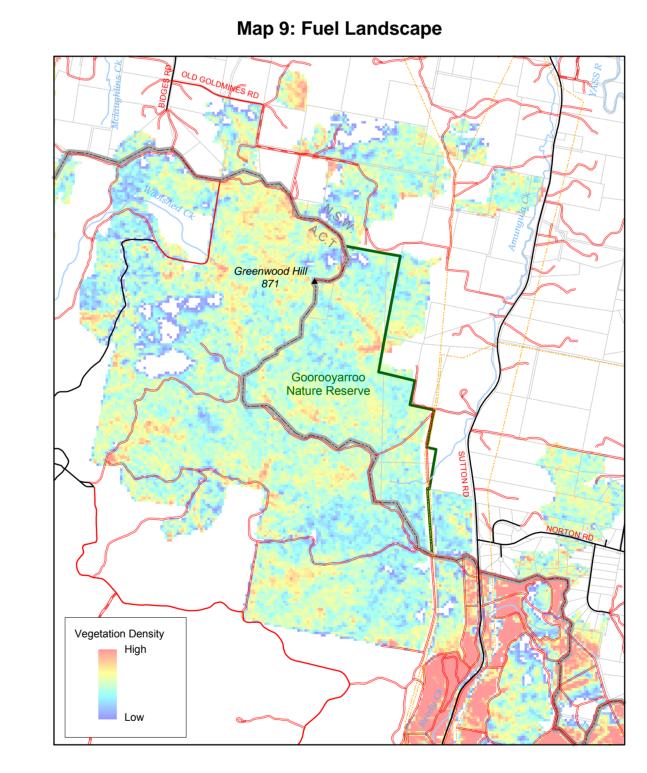
	MAP 8: BUSHFIRE MA	NAGEMENT ZONES
Management Zone	Definition	Management Guidelines
Asset	Life, property and commercial assets in high risk Bushfire Behaviour Potential on DECC	<ul> <li>Assets should be evaluated annually to measure potential hazards and or increased threats.</li> </ul>
(APZ)	estate.	<ul> <li>Works program to follow Risk Assessment of Economic 8 Private Property Guidelines.</li> </ul>
Strategic (SFAZ)	Strategic Fire Advantage Zones are areas used to target potential risks of high fire intensity, increased rate of spread, spotting or to consolidate APZ's. The zones identify areas	Zones should be assessed regularly to measure potential increases in hazard or risk by monitoring fuel and vegetation regularly. Monitoring should occur before and after the intended plan program/works.
	considered as appropriate for prescribed burns or other method of fuel manipulation, where they exist on this plan. All prescribed burns or other method of fuel manipulation must comply	<ul> <li>Prescribed burning or fuel manipulation programs should only be implemented where measured increases in risk have been identified in these zones.</li> </ul>
	with DECC policy and approved prior to implementation.	<ul> <li>Fuel management guidelines to comply with DECC policy and approved prior to implementation.</li> </ul>
Land Management	Areas of high priority natural and cultural conservation value. It identifies areas of 'recorded' cultural and natural assets. This	<ul> <li>Heritage areas should be assessed to determine potential hazard, threats and thresholds to cultural heritage, threatened species and vegetation communities.</li> </ul>
Zone 1 (LMZ1)	zone is important for the protection of cultural heritage and the conservation of some species habitat to prevent declining numbers or extinctions.	☐ Prescribed fire may be applied in these areas if appropriate for the protection of cultural heritage or for ecological principles.
Land Management Zone 2 (LMZ2)	This zone identifies areas of significance for natural and cultural features across the broader landscape. This generally means 'parts of the	<ul> <li>These zones should be monitored to determine threats to biodiversity and managed in accordance with conservation policy and principles.</li> </ul>
	reserve that have not been surveyed and or have no records of significant features or threatened species'.	☐ Implement programs and or recovery plan guidelines (where they exist).



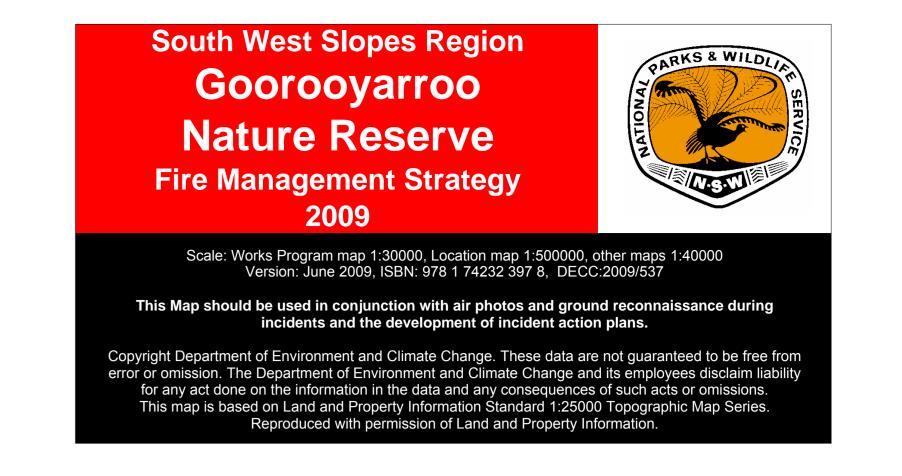
LMZ1

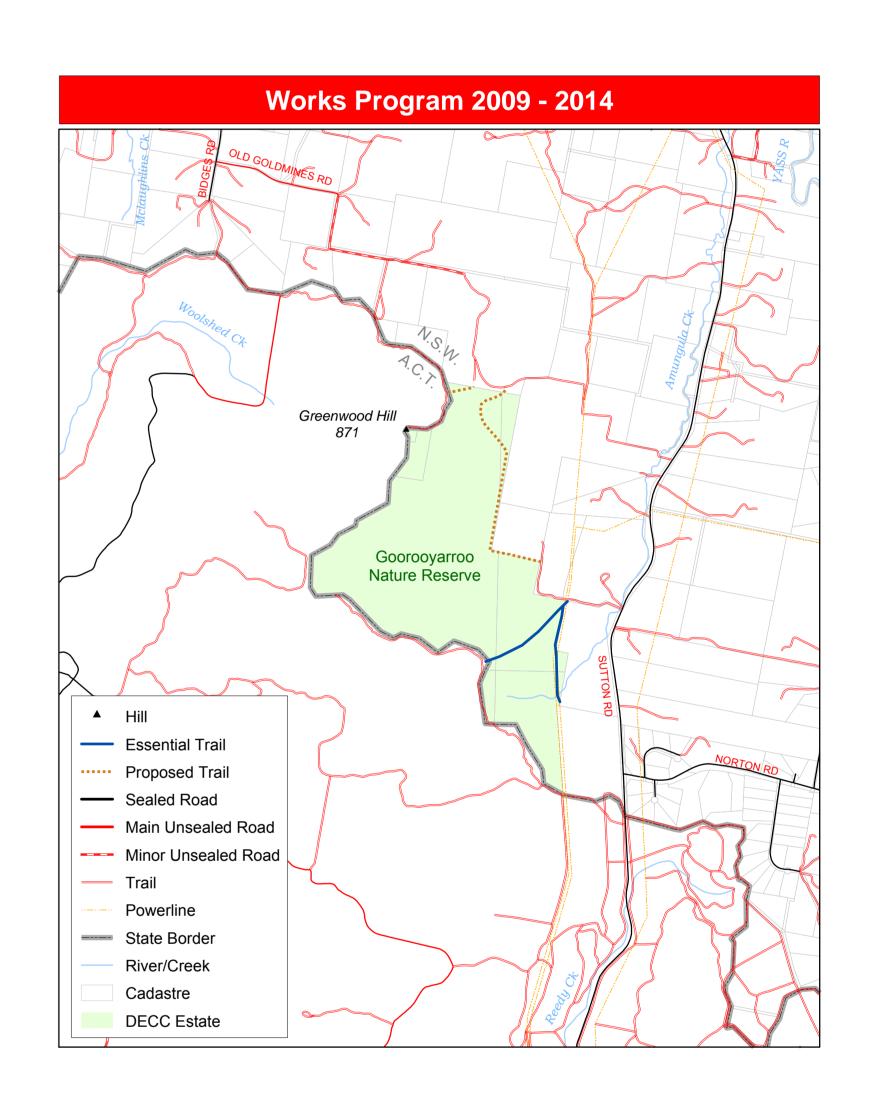


	MAP	5: BUSHFIRE B	EHAVIOUR PO	TENTIA	\L	
The ratings and mo	delling in th	ng (under moderate condition nis section of the plan are specific n with other reserve across the bi	to the reserve and map view ar	rea. The inform	ation within the map n West Slopes Region.	
Rating	Vegetat	ion Description			% of Reserve	
Low	Cleared	Cleared or Partly Cleared 4.0				
Moderate	Dry Tab	Cold, Moist Tableland Gum Complex (Snow Gum) Dry Tableland and Escarpment Box/Red Gum Complex Non – Eucalypt  17				
High	Dry Tab	Dry Tableland and Escarpment Gum/Stringybark Complex 79				
Very High	Pine Pla	Pine Plantation 0				
Aspect Bushfire B	ehaviour		Slope Bushfire Behaviou	r		
Rating		Aspect in degrees	Rating	Slope in o	legrees	
Low	Low 65 – 215		Low	0 - 10 deg	rees	
Medium	Medium 35 – 65 & 215 – 250		Medium	10 - 20 de	grees	
High		250 – 295 & 355 – 35	High	20 -30 deg	grees	
Very High 295 - 355			Very High	>30 degrees		



Slope Class Degrees	Fine Fuel Range in T/Ha	Threshold & Impacts
0-10	3-5	Less potential on lower slopes. Fine fuels averaging 4 t/ha are favourable.
10-15	4-7	Expected increase in gullies and wash-outs Fine fuels averaging 6 t/ha are favourable.
15-20	10-12	Increase expected through mid slopes and drainage lines. Fine fuels averaging 11 t/ha are favourable.
20-25	12-14	Increase across disturbed slopes and trails Fine fuels averaging 13 t/ha are favourable.
25-30	16-18	Large scale soil loss expected in disturbed areas. Impacts may be severe in areas feeding in to watercourses. Fine fuels between 16-18 t/ha expected to prevent slope instability.
>30	>20	High fuels on slopes >30 are rare in this reserve. Erosion potential is high and an expected natural process.
Threshold a	& Impacts	
Water qualit systems. O Maintaining Fuel decom reduction in organism ac	ty may be comprogregations dependently the fine fuel mining position after fire soil micro-organictivity.	as potentially unstable soils/slopes.  omised by soil disturbance and silt run off after fire and may have significant impacts on local karst lent on drainage lines and specific water quality are also at risk through soil disturbance.  mum range may reduce potential moisture loss in soils during summer periods.  may decrease (depending on fire intensity, fire interval, cover and patchiness of the fire) due to a sm activity. The presence of foams and retardants within the soil may also effect soil and micro-  ele fine fuels for the corresponding slope class are expected to have increased slope instability and,
	ement Guideline	





Asset	Priority	Name, Area or Detail	Management Strategy	Proposed Works
Goorooyarroo Nature Reserve	High	Unexploded ordnance	In the event that an item suspected of being ordnance related is found, it should not be touched, tampered with or moved in any way. Its general appearance should be carefully noted together with the best route to the item. The location should be prominently marked and the Queanbeyan Area office of DECC notified immediately.	All fire suppression operations are to be undertaken from formed trails only.
Reserve Trails	High	Essential trails	<ul> <li>□ Maintain trail to a standard classed as secondary in accordance with the Bush Fire Coordinating Committee Guidelines for the Classification of Fire Trails – Policy No. 2/2007.</li> <li>□ All trails to be clearly signposted at intersections and trailheads.</li> </ul>	□ Assess annually.     □ Initiate maintenance programs and works as required, or as specified in Regional Operations Program.     □ Establish the feasibility of developing a fire trail along the eastern edge of the reserve on the park boundary and implement if possible.     □ Develop a fire trail to formalise escape route from the Majura Firing Range through the NW corner of the reserve.
	Medium	Management trails	Maintain management trails for safe 4WD access.      All trails to be clearly signposted at intersections and trailheads.	Assess annually.     Initiate maintenance programs and works as required, or as specified in Regional Operations Program.
	2/2007 ma		ne Bush Fire Coordinating Committee Guidelines for the the operations map. Management trails are used for oth ry 9 vehicles, unless otherwise stated.	
Land MZ 1	Medium	Cultural heritage, threatened, vulnerable & endangered species, habitats, communities and the landscape.	Manage and protect natural & cultural heritage values with appropriate fire management regimes.	<ul> <li>Assess thresholds every 5 years, before works programs or directly after fire events.</li> </ul>
Information & Research	Low	Fuel and vegetation monitoring.	Establish fuel monitoring sites (7=3)	<ul> <li>Monitoring will use the Overall Fuel Hazard Guide.</li> </ul>
Fuel Management & Prescribed Burns	Low	No burns have been proposed for life of this plan (5 years).	Any prescribed burns must be managed in accordance with DECC policy and agreements with Local Bush Fire Management Committee.	☐ Negotiate proposed works programs at Bushfire Management Committee Meetings.