Map 1: Fire History - Wildfire Brungle Bald Hill Pine Mtn Peak Mudjarn , Bald Hill Killimicat Hill " 1970 - 1971 1951 - 1952

Brungle Bald Hill Pine Mtn Peak 691 # No fires recorded

MAP 6: THREATENED FAUNA

Threatened Fauna Management Guidelines

'mopping up' activities potentially decreases nest hollow and roosting site availability. Removal of dead and

down trees limits potential available foraging & nesting sites. The decrease in invertebrate abundance and

particularly fire extent (habitat loss), fledgling success may decrease for some species. Least likely period of

Protect areas of habitat from any fire that consumes the canopy, shrub layer & or large & mature trees.

Prescribed fires should ensure large patches of shrubs, standing and fallen timbers are left in tact.

Fire should be kept to small areas or managed to produce mosaic burnt areas more suitable in sustaining

Implement mosaic fire regimes designed to maintain the floristic & structural diversity of the understorey.

Monitor the use of fire suppression chemicals if used in recorded species habitat.

Threatened Flora Management Guidelines & Considerations

Located on the eastern reserve boundary of Pine Mountain Peak and all of the western portion of the

an important habitat for rare woodland birds, which is worth consideration when planning prescribed

Use existing trails as containment lines to prevent further fragmentation of this vegetation group.

Monitor the area for loss of biodiversity and manage within the vegetation group 33 guidelines. Prescribed fire should only be implemented where required for ecological purposes.

within the reserve.

behaviour potential.

Property assets may be damaged Work with neighbours to maintain access.

Provide guidelines in the event assets are constructed

Assets are over 400m from the reserve boundary and are

adjacent to low to moderate modelled fuels and bushfire

Participate in fire management proposals through RFS Zone

During the fire season rapidly respond to all unplanned fires

Bush Fire Management Committee meetings.

to minimise potential spread to private lands.

reserve (west of Brungle Road). Vegetation type 33 is a significant vegetation group in the reserve. It is

Frequent fire and or high intensity fires will effect these species. Fire often leads to a decline in insect

abundance and diversity, which some species are dependent on. Felling hollow bearing trees during

diversity following fire effects these species. Depending on the effects of other variables of fire regime,

Reduce the potential for frequent and or high intensity fires, especially between March and May.

Protect large, hollow bearing trees, especially during 'mop up' activities.

Note: The Powerful Owl appears in the Mudjarn Plan of Management, yet was not found in recent searches of Atlas. Fauna species

MAP 6: SIGNIFICANT FLORA

Scientific Name

burns or suppression activities during incidents.

Protect mature, large and hollow bearing trees.

There are no identified reserve

by fire escaping the reserve

Retardants and foams can be used in this area.

Note: Floristic information is based on data researched in December 2005, collated from CSIRO and NPWS floristic fire response

MAP 7: RISK ASSESSMENT - LIFE & PROPERTY

data sets. The vegetation group numbers should be referenced against the vegetation management guidelines in the Vegetation

vulnerability to fire is between March and May.

species habitat requirements.

Where possible;

requirements may differ to vegetation (floristic) requirements.

A Box woodland (alliances) Eucalyptus albens

Fire Group Common Name

Communities and Thresholds section of this plan.

Reserve Assets

(including private

property or other

lands adjacent to the

Speckled warbler

Barking owl

V Aug-Jan
V Jun-Feb
V Aug-Jan
V Jun-Oct
V Oct-Jan

Map 2: Fire History - Prescribed Burns

Maddon Lagoon	rungle MCGRUERS RD		7	Sional Cx
MUT RIVER				Brungle Bald Hill 682
NIMB	ORD			5
	Pine N 6	Attn Peak 191 # Wudjarn Nature Reserve	RAN	
	Killimicat	Mudjam Nature Reserve	CE	Rold Hill
	Killimicat Hill 361 #			Bald Hill # 812
A Go				

Map 3: Vegetation Communities

ap or vogetation communities	map ii vogotation iimoonota /iimaiyoto
Pine Mtn Peak 691 Mudjam Nature Reserve Killimicat Killimicat Hill 361	Brungle Brungle Brungle Bald # 682 Pine Mn Peak 681 Mudjarn Nature Reserve Killimicat Hill # 812 See table below for legend

Brungle MCGRUERS RD Maddon Lagoon	Slow CK
RIVER	Brungle Bald Hill # 682
NIMBO RD	
Pine Mtn Peak 691 # Mudjarn Nature Reserve	
Mudjarn Nature Reserve	
Killimicat	Bald Hill # 812
Killimicat Hill 361	
Very High	
Low	

Map 5: Bushfire Behaviour Potential

2	
3	
parison	
% of Reserve	
4	

South West Slopes Region

Mudjarn Nature Reserve

Fire Management Strategy

Scale: Works Program map 1:40000, Location map 1:700000, other maps 1:55000 Version: June 2006 ISBN: 1 74137 282 8 DEC: 2005/108

This Map should be used in conjunction with air photos and ground reconnaissance during

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This map is based on Land and Property Information Standard 1:25000 Topographic Map Series. Reproduced with permission of Land and Property Information.

incidents and the development of incident action plans.

	MAP	5: BUSHFIRE I	BEHAVIOUR PC	TENT	TAL	
The ratings a	and modelling are	ing (under moderate condition e specific to the reserve and maj lanaged by the NPWS South Wo	p view area. The information with	nin the map	area is not for c	comparison
Rating	Vegetation Ty	ре			Reserve Hectares	% of Reserve
Low	No Data				38.9	7
Medium	Natural Vegetation - Partially Cleared Blakely's Red Gum/Apple Box & Yellow Box - Grass/Forb Forest			24	4	
High		Red Box & Long Leaved Box - Grassy Forest Black Cypress Pine & Dwyers Red Gum Woodland			535	89
Very High	Nil identified				0	0
Aspect Bus	hfire Behaviour		Slope Bushfire Behavio	our		
R	ating	Aspect in degrees	Rating	Slop	Slope in degrees	
ı	_OW	30 - 230	Low	0 - 10	0 - 10 degrees	
Me	edium 05 - 30 & 210 - 230 Medium 11 -			11 - 2	11 - 20 degrees	
ŀ	High 230 - 280 & 345 - 05 High 20 -38			0 degrees		
Ver	Very High 280 - 345 Very High >30				legrees	

unaccounted for in the Bushfire Behaviour Modelling.

Time since fire is less than threshold intervals, but will be considered OK by 2006. Additional fire will push this vegetation into the vulnerable class. Fire should be avoided until after 2006. May require fire after 2006 for ecological or cultural heritage purposes. Planned fire may be introduced for prescribed burning for ecological or cultural heritage purposes, asset and strategic protection programs where appropriate. Unplanned fire events may be allowed to burn if The vegetation community requires fire for ecological purposes. Conditions are suitable. The intensity meets vegetation, flora and fauna community requirements. Heritage Management Zones requirements are met. >50% of the vegetation community group in the reserve is currently classed as Ok, Almost Underburnt and Underburnt. This area will fall into the Underburnt category by the end of 2006 if it remains unaffected by fire, but would fall into Recently Burnt if burnt in 2006. Planned fire may be introduced for prescribed burning for ecological or cultural heritage purposes, asset and strategic protection programs where appropriate if The intensity meets vegetation, flora and fauna community requirements >50% of the vegetation community group in the reserve is currently classed as Ok, Almost Underburnt and Underburnt. Fire is neither required or to be avoided. However, fire may be introduced for Fire should only be applied in areas other than APZ and SFMZ, if a loss of

MAP 4: VEGETATION THRESHOLD ANALYSIS

· Additional fire in this area will lead to adverse fire regimes and may threaten

· Fire should be avoided until another analysis of thresholds is modelled to reassess

There is minimal data available, which limits the modelling capabilities of DEC GIS.

community biodiversity, cause declines and or extinctions.

Threshold Vegetation % of Group Reserve Interpretation & Management Guidelines

Map 4: Vegetation Threshold Analysis

Note: The threshold analysis is derived from vegetation community thresholds and recorded fire history (including fire frequency and intervals). All vegetation communities should be monitored and prescribed fire should only be applied for ecological purposes. In the event of fire, the threshold analysis should be performed again to establish new threshold values.

MAP 9: FUEL LANDSCAPE

The ratings and modelling are specific to the reserve and map view area for a determined period of time. The information within the map area is not for comparison of the broader landscape managed by the NPWS South West Slopes Region, unless otherwise

The base line data for the fuel landscape map was extrapolated from NDVI (Vegetation Index) relationships from LANDSAT Imagery (2004) to calculate vegetation density across the landscape. No ground truthing has been performed to determine the accuracy of

The nearest reserve with similar vegetation type and seasonal information is Ellerslie Nature Reserve Conservation area. This

Fuel sites with photographic references should be established in Mudjarn Nature Reserve to improve landscape knowledge for fire

be located where data can be collected on different vegetation groups and fire histories and at least one site should be located in the

Fuel sampling should include the monitoring of vegetation community structure, progression and or succession, especially where

species structure responds similarly to drought and fire. This may provide indicators of other stresses and impacts within

ecosystems that require consideration in fire management planning programs, especially prescribed fire.

management planning and operations. It is recommended that a minimum of 4 sites be established within the reserve. Sites should

the information displayed in the modelled data for this reserve.

western part of the reserve off Brungle Road.

reserve recorded an average fine fuel level of 7.9 t/ha in Vegetation Group 32.

STI	Brungle		<u> </u>		
STUCKEYS RD	4	MCGRUERS RD	+ 0		
A R	Maddon Lagoon				
	RIVER				Brungle Ba
TUMUT					Brungle Ba # 682
	CK				1
Nimbo					
	NIMBO RD				
	7				3
			PINEM		
		Pine Mtr	Peak OUT		
		Pine Mtr 69	1 # ~	PA	
		13	Peak Mudjarn lature Reserve	NGE	
		Killimicat			
					# Balo # 8
	K	Gillimi <mark>cat Hill</mark> 361 #			
	1		t		. 4
			1	Car Car	
	Com rener				
F 60-					
See table b	pelow for legend				

Λ	MAP 3: VEGETATION COMMUNITIES & THRESHOLDS				
Veg Group	Vegetation Description	Ha's	% Cover		
32	Red Box & Long Leaved Box - Grassy Forest	196.7	33		
33	Blakely's Red Gum/Apple Box & Yellow Box - Grass/Forb Forest	23.6	4		
37	Black Cypress Pine & Dwyers Red Gum Woodland	331.8	56		
198	Natural Vegetation - Partially Cleared	0	0		
N/A	No Data	38.9	7		

Fire Interval	Vegetation Group	Vegetation Management Guidelines
10 - 50	Blakely's Red Gum/Apple Box & Yellow Box - Grass/Forb Forest 33	Species decline predicted if successive fires occur <10 years apart. Some species within the community may decline if fires occur >50 years apart and others may become locally extinct where successive fires occur >80 years apart. Daviesia, platylobium and cassinia species within the community, persistent after fire, are predicted to increase in cover, abundance and density if affected by fire. This has the potential to increase the bushfire behaviour within the community 5 years after disturbance. This community is significant to threatened fauna species. Where possible; Minimise the size of all fires and the potential for high intensity fire where the canopy maybe scorched. Manage fire to produce long term mosaic patterns. Monitor ecological response and health, particularly structural biodiversity. Protect mature, large and hollow bearing trees. Prescribed fire should be avoided in this community unless required for demonstrated ecological purposes.
10 - 100	Red Box & Long Leaved Box - Grassy Forest 32	Species decline predicted if successive fires occur <10 years apart. Some species within the community may decline if fires occur >100 years apart. Grassy understorey & ground fuels predicted to establish rapidly after fire. Daviesia, platylobium and cassinia species within the community, persistent after fire, are predicted to increase in cover, abundance and density if affected by fire. This has the potential to increase the bushfire behaviour within the community 5 years after disturbance. This vegetation community is susceptible to simplification. Where possible; Minimise the potential size of any fire and the potential for high intensity fire where shrubs are consumed. Manage fire to produce long term mosaic patterns. Prescribed fires should not be initiated where successive fires occur <15 years apart and or required for demonstrated ecological purposes. Protect mature, large and hollow bearing trees.
25 - 100	Black Cypress Pine & Dwyers Red Gum Woodland 37	Species decline predicted if successive fires occur <25 years apart. Some species may decline where successive fires occur >50 years apart, where others may become locally extinct after 100 years without fire. This community requires further research, however tends to be sensitive to fire regimes. Some species may respond to smoke as a cue to germinate. Soils prone to erosion with frequent or high intensity fire. This community is significant to threatened fauna species. Where possible; Minimise the size of fires and the potential for high intensity fire where the canopy maybe scorched. Protect mature, large and hollow bearing trees. Prescribed fire should be avoided in this community unless required for demonstrated

ecological purposes.

Note: Vegetation communities outside the reserve are not included in this table to report intervals, thresholds or model potential impacts

of fire on the community. Flora and Fauna management guidelines should be consulted in conjunction with vegetation management

Map 9: Landscape Fuels
Maddon Lagoon Brungle Bald Hill # 682
NIMBO RD
Pine Mtn Peak 691 # Mudjam Nature Reserve
Killimicat Hill # 812
Vegetation Density High

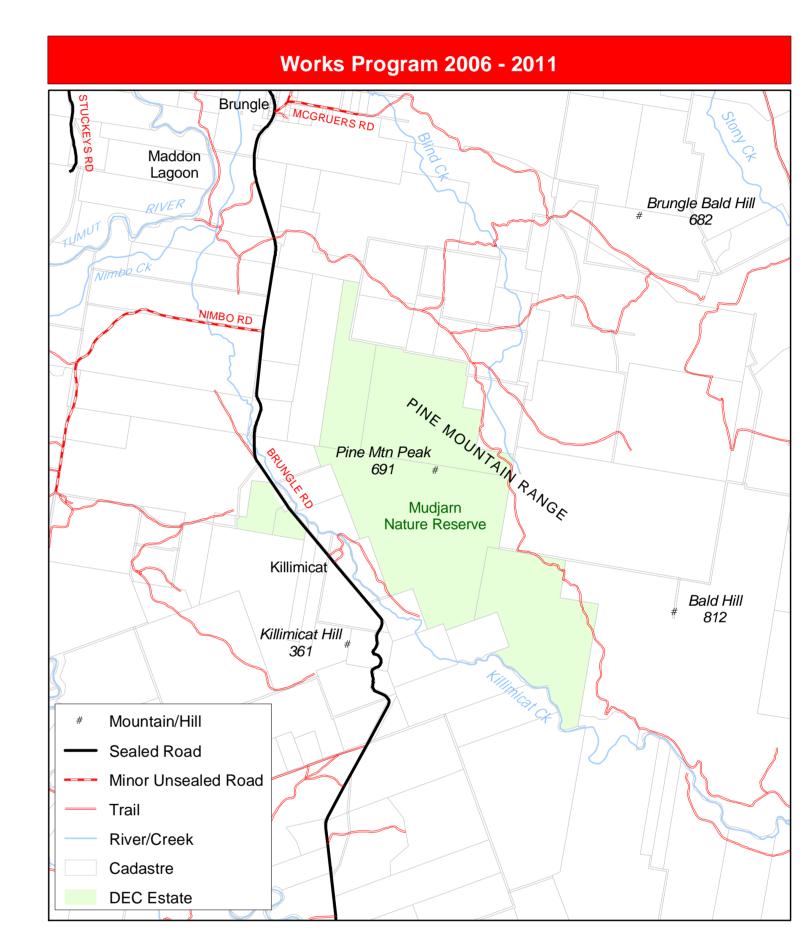
Low		
Management	MAP 8: BUSHFIRE MA	
Zone	Definition	Management Guidelines
Asset (APZ)	Life, property and commercial assets in high Bushfire Behaviour Potential risk areas on DEC estate.	Assets should be evaluated annually to measure potential hazards and or increased threats. Works program to follow Risk Assessment (Life and Property) Guidelines.
Fuel (FMA)	Fuel Monitoring Areas are localities for monitoring fine surface fuel, grasses, shrubs, dead and down material and ecological health.	Monitor regularly to quantify changes in the fuel landscape, which may indicate an increase in risk. Monitor to improve knowledge ecological responses and health and identify undesirable changes in vegetation communities. Use areas to establish SFMZ's where appropriate.
Strategic (SFMZ)	Strategic Fuel Management Zones are areas used to target 'potential' risks of high fuels, high fire intensity, increased rate of spread, spotting or to consolidate reserve APZ's. The zone is not a commitment to execute prescribed burns in the target area, within the life of the plan.	The implementation of fuel management programs should comply with BFCC guidelines and should be conducted in areas identified in this strategy as a SFMZ. Implementing prescribed burns or other vegetation manipulation program should only occur where more than 80% of the zone exceeds 15 t/ha (BFCC). Any program must include monitoring before and after prescribed burns to determine effectiveness of the program on fuels and the ecological impacts.
Heritage 1 (HMZ1)	Areas of high priority natural and cultural conservation value. It identifies areas of 'recorded' cultural and natural assets. This zone is important for the protection of cultural heritage and the conservation of some species habitat to prevent declining numbers or extinctions.	Heritage areas should be assessed annually to determine potential hazard, threats to cultural heritage, and thresholds for TSC and vegetation communities. Prescribed fire may be applied in these areas if appropriate for ecological purposes or protection of cultural heritage. Implement recovery plan guidelines (where they exist). Manage during incidents according to HMZ1 guidelines.
Heritage 2 (HMZ2)	This zone identifies areas of significance for natural and cultural features across the broader landscape. This generally means 'parts of the reserve that have not been surveyed and or	These heritage zones 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

threatened species'.

- Manage during incidents according to HMZ2 guidelines.

appropriate for ecological purposes or protection of cultural

have no records of significant features or



		WORI	KS PROGRAM	
Asset	Priority	Name, Area or Detail	Management Strategy	Proposed Works
Trails	High	Access behind Pine Mountain (Eastern side of Reserve) Off Brungle Road (Western part of the reserve)	Coordinate strategy for safe 4WD access for Category 9 vehicles.	Assess annually. Coordinate trail maintenance and works with local RFS and Council through the Bush Fire Manageme Committee.
	These trai	Is may not comply with the Bush Fire C	coordinating Committee Guidelines for the Classification	of Fire Trails - Policy No. 1/03.
Fuel MA	Medium	Where and if they have been identified.	Monitor areas to determine potential increased risk or changes within areas where Bushfire Behaviour Potential and Landscape fuels are greater than high .	Incorporate FMA's into Fuel Monitoring, Information and Research section of this plan.
Heritage 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.	Assess thresholds every 2 years, before works programs or directly after fire events.
Heritage MZ 2	Low	General landscape, natural and cultural conservation values.	Manage and protect natural & cultural values with appropriate fire management regimes.	Monitor thresholds every 5 years, and after fire events.
Information & Research	Medium	Fuel and vegetation monitoring. Helipads (natural & potential)	 Establish fuel monitoring sites (7= 4), including photographic reference points. Improve access to the reserve by identifying helipad sites for ground crew insertion. 	Establish by end 2006-2007 fire season. Establish appropriate monitoring regime (3-5 years). Identify in conjunction with LAC a Sites Officer by the end of 2007. Establish helipad sites where appropriate. Update fire management strategy.
Fuel Management & Prescribed Burns	Low	No burns have been proposed for life of this plan (5 years).	Any proposed hazard reduction burns must be managed in accordance with DEC policy and agreements with Local Bush Fire Management Committee.	Negotiate proposed works progra at Bushfire Management Commit Meetings.

Mudjarn Nature Reserve (591 ha) was gazetted on the 1st January 2001. For the purpose of this Fire Management Strategy, Mudjarn Nature Reserve will be referred to as the "Reserve", unless otherwise stated. The Reserve is situated approximately 11kms north of Tumut, New South Wales. The Reserve is in two parts, separated by 500m of agricultural land on either side of Killimicat Creek. The western part is a small portion of approximately 23 ha, adjacent to the Brungle Road. The eastern and larger part of the reserve straddles the Pine Mountain Range. The Brungle Aboriginal Community has a close association with the landscape, extending across the Tumut River Plains and

- Brungle Tumut Aboriginal Land Council.

RESOURCE INFORMATON

Kosciuszko National Park area. The vegetation community is generally those species and alliances expected with white box and cypress, Eucalyptus albens and Vehicle access to the reserve is limited to light vehicles, such as 4WD quad bikes, due to the abrupt and rocky terrain. There is no running water or dams within the reserve. Parks and Wildlife Division, National - Hume Federal Electorate. Environment Parks and Wildlife Service. - Burrinjuck State Electorate. South West Slopes Region, Riverina - Tumut Local Government Area. Highlands Area.

- Murrumbidgee Catchment Management Service Committee). IMPORTANT: The following planning information is based on the best possible options for each table category. When used in conjunction with other information in the plan, concessions may be needed where biodiversity requirements and asset managemen

Riverina Zone (Bushfire Management

Rural Fire

MAPS 1	& 2:	FIRE	HISTORY
1717 11 0 1	α 2.		11101011

	Ignitions	There are limited records for ignitions prior to the dedication of the reserve to Department of Environment and Conservation management. The only fires in memory are those which started fires in 1970-71 and 1951-52. Causes for these fires are unknown. However, these fires may have been from road side ignition (eg. cigarette, motor vehicle) and potentially lightning, based on the location and path of fire
	Hazard Reduction	No prescribed burns have been implemented within the Reserve by NPWS since gazettal in 2001. There are no records of hazard reduction or prescribed burns by the Department of Infrastructure, Planning and Natural Resources.
	Wildfire	Research indicates one wildfire started off the reserve in 1951-52, where the fire spread into the north western portion of Pine Mountain. This fire was contained to approximately 74 hectares in size. Another fire started on the boundary of the reserve during the 1970-71 fire season, but the fire was contained to an area of approximately 1.

The frequency and interval between fire events has various impact on biodiversity and structural diversity within the Fire local area and broader landscape, as well as identify potential fire prone areas, patterns, ignitions and paths. Frequency As only a small area of the northern section of Pine Mountain has been burnt once in 53 years, the reserve has a low potential for fire events, where vegetation groups represent communities with minimal fire disturbance.

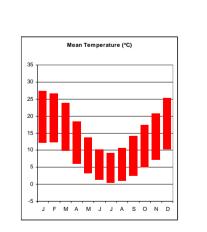
MAP 6: CULTURAL HERITAGE

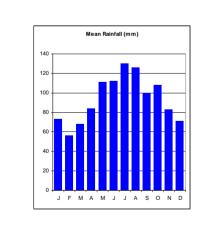
Ney Management Guidelines
Identified sites must be protected.
DEC Databases, AHIMS and HHIMS, must be accessed during incidents and or for preparation of Review of Environmental
Factors for fuel reduction burning or other works programs to ensure new records are included. Aboriginal site information from
AHIMS is sensitive and subject to a Memorandum of Understanding. Site data must respect this agreement and must be used
appropriately.
For prescribed burning programs, protection measures will be outlined in the Review of Environmental Factors and burn plans.
Where possible;
Trained officers will provide advice on site protection methods

Trained officers will provide advice on site protection methods.
Activities will comply with all conservation management plans (where they exist). Recorded sites within the Reserve include, isolated and scattered artefacts and stone and rock arrangements The area is significant to the people of the local Aboriginal community as a spiritual link with the landscape. Follow operational guidelines to protect heritage.

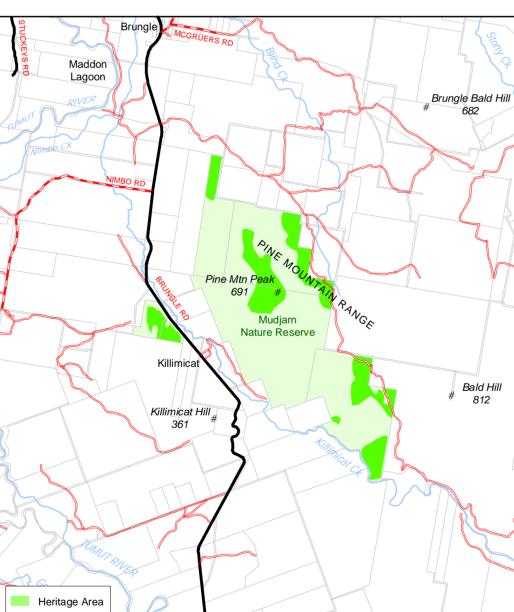
Sites recorded include, mine shafts (horizontal and vertical), mullock heaps, test pits and timber post and rail Historic Heritage fences. The mountain peak known as Pine Mountain is also recorded as a Historic Site in HHIMS. Follow operational guidelines to protect heritage. Note: Cultural heritage sites were extracted from the AHIMS and HHIMS databases, Knight (2004) and the Mudjarn Nature Reserve Plan of Management (2005).

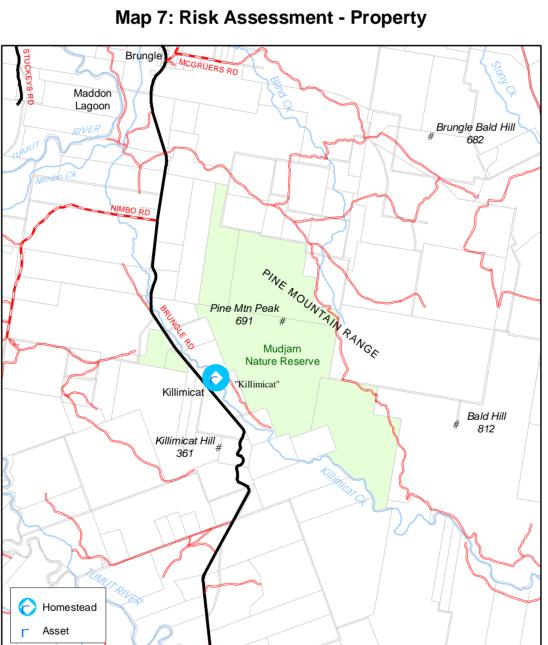
Location





Map 6: Risk Assessment - Cultural & Natural





Map 8: Bushfire Management Zones SFMZ HMZ1