

Pemulwuy Greystanes Bushfire Management Plan

Cumberland City Council



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Template 2.8.1

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Abbreviations

Abbreviations	Description
AHIMS	Aboriginal Heritage Information Management System
APZ	Asset Protection Zone
DPIE	Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
CCC	Cumberland City Council
FFDI	Forest Fire Danger Index
HLEP	Holroyd Local Environmental Plan
IPA	Inner Protection Area
OPA	Outer Protection Area
NSW RFS	NSW Rural Fire Service

Executive Summary

This document presents a Bushfire Management Plan for the Cumberland City Council reserves in the Pemulwuy and Greystanes areas, including both Grey Box Reserve and Marrong Reserve. The plan seeks to strategically identify environmental, heritage, and human settlement assets that are at risk from the impact of bushfires and to formulate objectives, strategies, and a works program to mitigate this risk. The aim of the Plan is to recommend strategies to facilitate life, property, environmental and heritage protection in response to the bushfire hazard within the subject reserves.

The Plan details the site context, analyses bushfire hazard and then presents a bushfire risk assessment of the assets at risk. Bushfire management strategies are presented based on the bushfire risk assessment, followed by a works schedule to collate all bushfire risk mitigation recommendations.

The bushfire risk assessment identified that the assets at risk covered Life; Property; Environment; and Heritage. However, it noted that the risk exposure was Minor or Insignificant in all cases. The site context was important in this analysis, which noted a comparatively lower overall risk context.

The risk assessment informed the bushfire management strategies recommended. These covered bushfire management zoning (including maintenance of Asset Protection Zones); access and egress; and education and extension programs.

The Plan guides Council in the appropriate bushfire management activities within the reserves for the next five years.

1. Introduction

1.1 Purpose of Plan

Cumberland City Council (CCC) engaged Eco Logical Australia (ELA) to prepare a Bushfire Management Plan (BMP) for the Council reserves in the Pemulwuy and Greystanes areas. This plan aims to strategically identify assets (environmental, heritage, and human settlement) that are at risk from the impact of bushfires and to formulate objectives, strategies, and a works program to mitigate this risk. This will guide CCC in the appropriate fire management activities within the reserves for the next five years, including actions required by CCC and other responsible parties. This plan is further referenced herein as the 'BMP'.

The BMP covers an area of approximately 90 ha of land managed by CCC and bounded by Prospect Hill, Daruga Avenue and Silverthorne Drive, Pemulwuy to the west and north; Greystanes Road and Gipps Road, Greystanes to the east; and Dahlia Street Greystanes / Liverpool-Parramatta Transitway to the south (see Figure 1).

The BMP includes both Grey Box Reserve and Marrong Reserve within the urban precincts of Pemulwuy and Greystanes. The reserves provide a diversity of recreational, ecological, scientific, cultural and aesthetic opportunities but are also a bushfire risk to the local community and users of the reserve.

1.2 Fire Planning Context

In New South Wales (NSW), Local Bush Fire Management Committees (BFMC) are formed to identify assets at risk from bushfire, including buildings, infrastructure, communities, as well as culturally and environmentally significant locations. Bushfire mitigation approaches are then developed to lessen the risk to those assets and documented in a strategic level BRMP document. Cumberland Local Government Area (LGA) is not currently covered by a Bush Fire Risk Management Plan (BFRMP) under Section 52 of the *Rural Fires Act 1997*. However, bushfire hazard is noted within the Cumberland Council Local Emergency Management Plan 2017. Further, bushfire management needs for the subject area are noted in existing reserve Plans of Management such as for Grey Box Reserve (ERM 2006) and Marrong Reserve, Pemulwuy (Stuart Noble Associates 2014).

The area contained within this BMP is not currently certified as Bush Fire Prone Land by the Commissioner of the NSW Rural Fire Service. However, in December 2019, part of the subject area where burnt by bushfire. Further, there are currently plans underway by CCC to have the area certified as Bush Fire Prone Land, based on the draft mapping undertaken by Eco Logical Australia (Figure 2).

A site assessment was undertaken by two ELA bushfire consultants (Nathan Kearnes and John Norris) on the 5th February 2020, to identify the constraints and opportunities to bushfire management.

1.3 Plan Format

This BMP details fire management actions provided as A4 maps and tables as a succinct document for CCC and other parties responsible for implementation. Background information provides context, summarises assets (built, community and environmental) and informs the underpinning risk assessment.

1.4 Relevant Legislation and Guidelines

1.4.1 Rural Fires Act 1997

The *Rural Fires Act 1997* (RF Act) provides for:

- i the prevention, mitigation and suppression of bushfires in rural fire districts;
- ii co-ordination of bushfire mitigation and suppression across all of NSW;
- iii the protection of people from injury, death and property from damage arising from fires; and
- iv the protection of the environment.

Under Section 63 (1) (a) of the *RF Act*, ‘local authorities’ have a duty of care to take all practicable and notified steps (if any) to prevent fire occurring on land under their care and control and to minimise the risk of a fire spreading on or from their land.

Section 50 of the RF Act establishes the requirement for Bush Fire Management Committees in each LGA where this contains some portion of a Rural Fire District. Part 3 of the *Rural Fires Regulation 2008* (RF Reg) outlines the constitution, membership and functions of a BFMC including the requirements for larger landholder participation.

1.4.2 Holroyd Local Environment Plan 2013 (HLEP)

The Holroyd Local Environment Plan 2013 (HLEP) has been developed under Division 5 of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act). The HLEP aims to make environmental planning provisions for the land in Pemulwuy and Greystanes areas in accordance with the relevant standard environmental planning instrument under Division 3.2 to Division 3.5 of the EP&A Act.

Under the HLEP, the majority of the land subject to this BMP is zoned RE1 Public Recreation, with a small area on the west zoned E2 Environmental Conservation. The RE1 zone has the objectives of enabling land for public use and recreation purposes, compatible land use, enhancing the natural environment for recreational purposes and catering to development for community benefit. The objectives of the E2 zone are to manage and restore areas of higher environmental value and prevent development that could adversely affect the zone.

There is a draft LEP that has now been released for CCC, dated 24 April 2020. This draft LEP proposes some changes to the land zoning within the subject area, including introduction of R3 Medium Density Residential and R4 High Density Residential. Should this change to land zoning be brought into effect, this BMP will need to be updated.

1.4.3 Bushfire Environmental Assessment Code

The Bushfire Environmental Assessment Code (NSW Rural Fire Service (RFS) 2006) provides a streamlined environmental assessment and approvals process for (but limited to) bushfire hazard reduction activities via a Hazard Reduction Certificate. Any proposed hazard reduction works within the BMP area, which involve the treatment of native vegetation or prescribed burning, require approval, and a Hazard Reduction Certificate issued by the NSW RFS provides a mechanism for this.

1.4.4 District Bush Fire Risk Management Plans

A BFRMP describes the level of bush fire risk across an area. The BFRMP identifies assets within the community at risk from bush fire, assesses the level of risk to those assets and establishes treatment

options to deal with the risk and the agency or the entity responsible for carrying out those treatments. At present no BFRMP exists for the Cumberland LGA that identifies bushfire mitigation actions for reserves within CCC managed lands.

1.5 Aim and Objectives

The aim of this BMP is to recommend strategies to facilitate life, property and environmental protection within the Pemulwuy and Greystanes precincts in response to the bushfire hazard within the subject reserves.

The general objectives of the BMP are:

- Reduction of the potential effect of bushfires on life and property within and adjoining the subject reserves within the Pemulwuy and Greystanes precincts; and the
- Conservation of biodiversity, landscapes, visual amenity and water quality.

The specific objectives are to:

- Provide bushfire management zones that enable effective application of strategy and programs;
- Assist in reduction of unscheduled human influenced bushfires;
- Minimise the spread of bushfires in the Pemulwuy and Greystanes precincts and the potential impact of these on assets;
- Provide appropriate fire regimes and hazard reduction activities to avoid detrimental impacts on species, communities, populations and culturally significant assets; and
- Provide a 5 year operational works program.

1.6 Limitations of the Plan

The task of establishing appropriate mitigation measures in areas of existing development is often complicated. Where new development occurs, the built environment is designed to current best practice bushfire protection, however with existing development it is typically not possible to retrofit buildings or their related infrastructure to comply with the same standards. It is also typically not possible to reduce the risk through substantial modification of adjoining bushland areas such as with an APZ of a width that reduces risk to contemporary required levels. This is because the remnant bushland typically has significant environmental constraints such as threatened species, EEC and other environmental considerations.

A limitation of this BMP is that current best practice bushfire planning guidelines are unable to be strictly applied given existing constraints both on and off site within the Pemulwuy and Greystanes precincts . A risk-based approach has therefore been utilised so that the bushfire risk is reduced to the lowest level possible under the biophysical and socio-economic constraints of the locality.

1.7 Residual risk

Residual risk is defined as the bushfire risk that remains after the implementation of bushfire risk reduction measures. It is acknowledged that despite the bushfire protection measures within this BMP, some bushfire risk to life and property will remain. It is simply not possible to provide complete protection for life and property located near to areas of bushfire hazard.

2. Site Description

2.1 Landscape Context

Located on the urban fringes of Pemulwuy and Greystanes precincts, CCC manages reserves (including Marrong Reserve and Grey Box Reserve) which provide an extensive public recreational space as well as promoting environmental protection.

The reserves are located within the southwest of the Cumberland LGA, to the east of Prospect Reservoir and north of Prospect Creek.

The reserves have a mixture of natural and exotic vegetation with dense understorey abutting cleared open spaces and residential areas. Within the BMP area, Prospect Hill Pine Forest is a highly visual site in the local landscape, visible from residential areas and notably the Prospect Highway.

Over the last 8 years, suburban housing has filled in the urban area north of Silverthorne Drive and Bundeluk Avenue, Pemulwuy. Given no land within CCC LGA is currently certified as bushfire prone land, recent and previous land development neighbouring the reserves has not been formally afforded with bushfire planning standards and protection measures.

2.2 Built Assets and Community

The BMP area is bounded by the residential areas of Pemulwuy to the north and Greystanes to the east. The urban area is predominantly single dwelling residences. To the west and south is predominately industrial estate in the precincts of Smithfield, Wetherill Park and Pemulwuy.

A Scout hall (together with three other non-habitable structures) are also located well within the middle of CCC reserves and exposed to the surrounding bushfire hazard.

There is also an existing concrete bike path which runs off Silverthorne Drive Pemulwuy linking to a primary bike path which runs through the BMP area both to the southwest to the Prospect Highway (and beyond the subject area to Prospect Reservoir) and east to Gipps Road Greystanes (and beyond the subject area to Guilford).

2.3 Biodiversity

The protection and enhancement of biodiversity relies on management strategies in all levels of government. The Cumberland Biodiversity Strategy (2019) aims to outline how national, state and local targets can be met by Cumberland Council over the next five years.

In the Cumberland LGA, there are 11 Endangered Ecological Communities (EECs) listed as threatened under the NSW Threatened Species Conservation Act (TSC Act). Within the BMP area there are remnant areas of Cumberland Shale Plains Woodland, Cumberland River Flat Forest, and Coastal Freshwater Wetland identified.

2.4 Fire History

Recent fire history in the area includes the Hyland Road fire which occurred on the 31st December 2019, burning to a total size of approximately 50 ha within the BMP area. The fire started within the southern end of the BMP area, in the Prospect Hill Pine Forest and spread in a north to north easterly direction into Marrong Reserve. The fire was believed to have been an act of arson.

Other recorded fire history includes the Windemere Road Fire in 2002, just south of the BMP area, which burnt an area of 12 ha.

2.5 Historic Heritage

The Holroyd Local Environmental Plan (HLEP) has two areas listed of local significance which includes one site at Greystanes (Prospect Hill) and another at Pemulwuy (House and Farm Building Hyland Road) (see Figure 5).

Prospect Hill is also listed as an area of cultural significance on the NSW State Heritage Register (SHR). Prospect Hill was considered a major geographical reference point by the early settlers having important land use in farming, pastoral and rural land use.

2.6 Aboriginal Heritage

Previous Aboriginal occupations were present in the Prospect Hill area, with numerous camp sites located in the surrounding area. An extensive search of the Aboriginal Heritage Information Management System (AHIMS) database relating to Grey Box Reserve and surrounds (ELA 2020) revealed records of scarred tree sites and surface artefact sites, which indicates the prior utilisation of the subject site by Aboriginal communities.

The CCC Reconciliation Action Plan (2019) notes Prospect Hill, Pemulwuy as a significant site as it *“is where the first recorded act of reconciliation in New South Wales took place on 3rd May 1805”*.

2.7 Recreational Use

The predominate use of the BMP area is recreational use through the provision of open spaces and facilities. Marrong Reserve provides much of the needs for increasing demand on recreation facilities of the area including open space for public recreation, walking / bike paths, seating arrangements, visual and educational opportunities.

General recreation activities are available within Grey Box Reserve, however are not promoted and utilisation is lower.

2.8 Existing bushfire asset and advantages

Access to the BMP area for firefighting purposes is via Daruga Avenue and Silverthorne Drive, Pemulwuy and Greystanes Road and Gipps Road, Greystanes.

Cyclone fencing and locked gates are located around the perimeter of the BMP area including Gipps Road, Hyland Road, off Prospect Highway, Widemere Road and west end of Grey Box Reserve off the cycleway (just east of the retention basin) which restricts unwanted public access.

It should be noted that vehicle access is partially restricted with concrete bollards off the unsealed vehicle track to Prospect Hill at the junction of Daruga Avenue and Bundeluk Avenue Pemulwuy. Access restrictions to this track could be improved with further fencing and gating as required.

Reticulated water supply via hydrants are available along the public roads in the adjoining residential and industrial area. These public roads have a fully sealed surface.

3. Bushfire Hazard Analysis

This chapter describes the bushfire risks to the sites as assessed using Geographic Information Systems (GIS), a field-based analysis of the bushfire hazard, and a review of assets at risk.

3.1 Fire Climate

The greatest potential for bushfire events at the site occurs October-March coinciding with fresh to strong south west to north west winds and summer weather condition and storm potential.

Whilst the declared bushfire season occurs from 1 October to 31 March annually, lower than average rainfall can extend the bushfire season through summer to early autumn. The bushfire season can also be brought forward when a drier than average winter results in the landscape being more susceptible to fires starting and spreading in late spring and early summer.

Strong west to north westerly winds and low drought indices in the Cumberland area are the conditions that will elevate the fire danger rating. The mean annual rainfall at the Prospect Reservoir Station is 874 mm with drier months occurring July through to October (BOM, 2020).

3.2 Vegetation Formation

The vegetation throughout the BMP area is highly disturbed with weed growth impacting vegetation communities, creating immense variation in the condition of vegetation.

A large majority of the vegetation within the BMP area is cleared and/or modified with high weed and exotic vegetation, and small remaining remnants of Shale Plains Woodland, Shale Hills Woodland, and Alluvial Woodland.

For bush fire assessment purposes, the primary formations of vegetation throughout the BMP area are classified as 'Forest' and 'Woodland'.

Where open space and managed lands are located throughout the BMP area it would be considered these areas have a Low fuel hazard. Figure 3 shows the vegetation communities and formations.

3.3 Slope

The subject land is generally located on lower elevations with flat to moderate topography in the middle of the BMP area bounded by Prospect Hill, Silverthorne Drive, Greystanes Road and Munro Street where drainage lines are present. Much higher elevations on the west of the BMP area where the land rises steeply to Prospect Hill are present.

The higher elevations towards Prospect Hill mean that any fires that move from the west to east may become controllable periodically with downhill spread. However, upslope spread of fires to the north or west has the potential to cause greater fire spread with potential spotting.

Steeper areas where fire control is typically more problematic occurs to the west and north-west of the subject land, notably on the west upslope from the bikeway at the Prospect Highway up to Silverthorne Drive.

3.4 Climate Change

Changes in global climate have the potential to significantly impact bushfire behaviour in Australia. The effect of climate change on bushfire risk is still being realised and in particular; predicting the impacts of climate change in specific regions or at the individual site level is very complex. However, as identified in Cumberland City Council's Environmental Management Framework, climate change effects are already evident in the form of increasing temperatures, drier conditions and intensity of extreme weather events.

Some of the most thorough and current research on the issue comes from a CSIRO publication in collaboration with the Bushfire Cooperative Research Centre and Australian Bureau of Meteorology entitled '*Climate change impacts on fire-weather in south-east Australia*' (Hennessy et al. 2005). This paper uses statistical modelling and landscape simulation to provide a number of predictions, some of which are relevant to this study, including:

- Changes to bushfire behaviour over the next 50 years are likely to be greatest inland, and relatively less along the coast;
- An increase of between 1-6 days per year of Very High or Extreme FFDI days in Sydney by 2050; and
- The window available for prescribed burning in Sydney may shift and narrow by 2 to 3 weeks.

It is not clear what the specific effects of climate change will bring for the BMP area specifically, however as indicated above, the window for prescribed burning is likely to reduce and days of higher fire danger are likely to increase. This Plan has considered future climate change (broadly) when determining bushfire risk.

3.5 Assets at Risk

Bushfire, bushfire management, and bushfire suppression activities all have the potential to adversely impact built and environmental assets in and around the BMP area. Damage or destruction of these assets may have economic, social, and environmental consequences.

3.5.1 Built Assets and Future Residential Development

Built assets surrounding the BMP area include residential development, industrial development, and other community-based buildings namely the Castle Hill RSL Small Bore Rifle Club (off Hyland Road), and Greystanes Scout Hall Buildings. Other assets include reserve infrastructure namely access gates, fencing, playground equipment, recreational and picnic facilities.

Residential assets that are near to the Cumberland Plains Woodland adjoining Alpha Road/Dahlia Street Greystanes may be at risk on an elevated fire danger day due to minimal Asset Protection Zones (APZ).

Further residential assets located off Hyland Road, Munro Street, Bilpin Street, Watkin Tench Parade, Silverthorne Drive, and Daruga Drive all have somewhat increased Asset Protection Zones in place due to more favourable site conditions or where the incorporation of a perimeter public road is included in these managed areas and therefore face a lower risk of exposure to direct flame and radiant heat attack.

It should be noted irrespectively that bushfires attack built assets through flame contact, wind, radiant heat, smoke and burning debris. Ember attack is responsible for most bushfire related house losses. However, with small APZs flame contact and high radiant heat may pose the greatest risk.

Bushfire protection planning should aim to prevent flame contact, reduce radiant heat to below the ignition thresholds for various elements of a building, minimise the potential for embers to cause ignition, and reduce the effects of smoke on residents and firefighters.

In reference to future development, there are development proposals for two residential flats at Pemulwuy (Lot 4012 DP 1154533) and a large urban residential subdivision at South Pemulwuy (Lot 2066 DP 1151368). Bushfire protection measures such as APZ, access and water supply have been incorporated into the proposed development design. Following construction of these developments, it is recommended that CCC undertake to review this plan.

3.5.2 Endangered Vegetation

The Endangered Ecological Communities (EEC) within the BMP area are identified as Shale Plains Woodland, Shale Hills Woodland, and Alluvial Woodland, which are at risk from 'bushfire regimes' and bushfire management, as discussed below. Council's Biodiversity Strategy notes that *"Changes to the frequency or intensity of the fire regime will change the species composition of certain ecosystems. Environmental burns can assist with regenerating urban bushland, but careful consideration needs to be given to tailoring the fire regime to the target community to avoid adverse impacts"*.

In March 2000, the Scientific Committee, established through the *Threatened Species Conservation Act 1999*, made a Final Determination to support a proposal to list *"High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition"* as a Key Threatening Process on Schedule 3 of the Act. The threat of high frequency fire occurs in all fire-prone habitats in NSW, although the likelihood of occurrences of high frequency fire is currently greatest in coastal and tablelands habitats and in urban areas.

The NSW Scientific Committee listing for Cumberland Plain Woodland (2004) includes inappropriate fire regimes as a threat to the EEC and the priority actions for recovery of the EEC include no fire more than once every 7 years.

Bushfire regimes, bushfire suppression and bushfire management activities also have the potential to exacerbate weed problems. Weed invasion is a threatening process to the EEC and a general problem for most urban reserves. Weed species that threaten biodiversity in the BMP are African Olive, Blackberry, Lantana, Broad Leaf Privet and Narrow Leaf Privet. These species will respond well to the exposed, nutrient increased, and competition free conditions following fire.

Fire suppression activities may also damage vegetation and soil through the use of heavy vehicles and the creation of new tracks. These tracks may erode or become vectors for problems associated with access such as weed and pest invasion, and fire ignition.

Bushfire management activities may allow these and other weeds to penetrate new areas and increase the density of existing infestations. As such, appropriate vegetation management before and after fire is required to mitigate this risk. This is discussed later in Section 6.

4. Bushfire Risk Analysis

4.1 Risk Context

The BMP area is a small and disjointed pocket of vegetated open space within a highly urbanised setting. The location is not connected to larger tracts of bushfire prone land. Much of the vegetation is modified by previous disturbance or weed invasion, thus changing the vegetative hazard, generally reducing it. The terrain is a mix of flat to undulating along with areas of steeper slopes, the later however, generally do not provide uphill fire runs to adjacent assets. Given these characteristics, the BMP area is considered to have a lower overall risk context in comparison to some other sites.

4.2 Risk Analysis

The analysis provided throughout this Section and summarised in Tables 5, 6, 7 and 8 assesses the risks from bushfire to people, property (infrastructure, assets, private property), environmental assets, and cultural assets. The methodology adopted is that given in AS/NZS 31000:2018 'Risk management – Principles and guidelines' whereby a risk classification scheme is developed through qualitative scales of likelihood and of consequence.

This assessment adopts a definition of likelihood based on likelihood of occurrence over the currency of the BMP (i.e. 5 years). The scale of likelihood is shown below and is based on AS/NZS ISO 31000. Values have been allocated to the likelihood descriptors on a scale of 1 to 5 with 1 being extremely rare (extremely unlikely) and 5 being almost certain, as outlined in Table 1 below.

Table 1: Likelihood Description

Likelihood Descriptor	Description
Almost certain (5)	The event is expected to occur in most circumstances during the currency of the plan
Likely (4)	The event will probably occur in most circumstances during the currency of the plan
Possibly (3)	The event might occur at some time over the currency of the plan
Unlikely (2)	The event could occur at some time over the currency of the plan
Rare (1)	The event may occur only in exceptional circumstances

The scale of consequence is shown below. Values have been allocated to the consequence descriptors on a scale of 1 to 5 as outlined in Table 2 below

Table 2: Consequence Description

Consequence Descriptor	Description
Catastrophic (5)	Death, huge financial loss, irreversible widespread environmental damage
Major (4)	Extensive injury, major financial loss, irreversible local environmental damage
High (3)	Medical treatment, high financial loss, Long-term environmental damage
Medium (2)	First aid, medium financial loss, Short-term environmental damage
Low (1)	No injuries, low financial loss, minor environmental impact

Rating codes and the level of risk have been then calculated by multiplying likelihood levels and consequence levels with the rating determined as per the scale outlined in Table 3 below.

Table 3: Risk Rating

Level of risk	Risk rating
0 - 4	Insignificant
5 - 9	Minor
10 - 14	Moderate
15 - 19	Major
20 - 25	Extreme

Table 4 below provides an analysis of the risk factors. The risk assessments presented in Tables 5, 6, 7, and 8 indicate that, over the currency of the BMP, threats to life, property, heritage and environmental range from insignificant to moderate risk and will require appropriate risk management accordingly.

Table 4: Analysis of risk factors

Risk Factor	Analysis of the risk factor
1. The likelihood of human and natural fire ignitions, as influenced by time, space and demographics.	<p>Natural ignitions within the BMP area are unlikely.</p> <p>Human induced ignitions are known to be relatively more frequent at the urban/bushland interface and the accessibility of the BMP area makes ignitions more likely.</p>
2. The potential spread and severity of a bushfire, as determined by fuel, topography and weather conditions.	<p>Slope is likely to be the primary determinant of the direction of fire spread. The sloping landscape of the BMP area is likely to contribute to the spread of fire, with steeper slopes located on the west of the site.</p> <p>The vegetation formations are considered to provide moderate hazard. The area is exposed to strong north-westerly and southerly winds.</p>
3. The proximity of assets vulnerable to bushfire and likely bushfire paths.	<p>The BMP area has development on the north, south and east.</p> <p>The adjacent development is largely urban residential, with adjoining industrial development on the southeast aspect.</p> <p>There are EECs within the BMP area. Inappropriate fire regimes may threaten these communities.</p>
4. The vulnerability of assets, or their capacity to cope with, and recover from bushfire.	<p>Most nearby urban residential buildings do not include specific measures to withstand bushfire attack e.g. construction in accordance with AS 3959-2018 'Construction of buildings in bushfire-prone areas' (Standards Australia 2018).</p> <p>Fire may impact threatened communities.</p> <p>Fire events may exacerbate weed invasion.</p>

Table 5: Bushfire Risk Assessment – Life

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of risk (A x B)	Rating
Populated area where the combination of threat and vulnerability expose a community to a significant likelihood of fatalities and major injuries.	5	1	5	Minor
Less likely to be fatalities or major injuries due to the presence of attributes which afford some protection.	4	1	4	Insignificant
Loss of life or major injury highly unlikely. Medical/hospital treatment may be required.	3	2	6	Minor
Minor injuries only - first aid treatment. No major injuries or fatalities likely.	2	3	6	Minor
No injuries or fatalities likely.	1	4	4	Insignificant

Table 6: Bushfire Risk Assessment - Property (infrastructure, assets and private property)

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of risk (A x B)	Rating
Extensive and widespread loss of property. Major impact across a large part of the community and region. Long term external assistance required to recover.	5	1	5	Minor
Localised damage to property. Short-term external assistance required to recover.	3	2	6	Minor
Short-term damage to individual assets. No external assistance required to recover.	2	3	6	Minor
Inconsequential or no damage to property. Little or no disruptions to the community.	1	4	4	Insignificant

Table 7: Bushfire Risk Assessment – Environment

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of risk (A x B)	Rating
Local extinctions of native species.	4	1	4	Insignificant
Irreversible damage to the environment.	4	2	8	Minor
Long-term damage to the environment over a landscape scale.	4	2	8	Minor
Short-term, localised damage to the environment.	2	3	6	Minor
Minor impact on the environment.	1	4	4	Insignificant

Table 8: Bushfire Risk Assessment - Heritage

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of risk (A x B)	Rating
Loss and/or irreversible damage to sites or objects of national, state or regional significance.	5	1	5	Minor
Extensive damage to sites or objects of national, state, regional or local significance requiring major external assistance.	4	1	4	Insignificant
Short-term damage to individual objects. Short term external assistance required to repair.	2	1	2	Insignificant
Short-term, localised damage to a small number of sites, objects and the cultural landscape.	2	2	4	Insignificant
Minor impact on sites or items which are repairable with little to no external assistance.	1	3	3	Insignificant

5. Hazard Management

Bushfire risk management should aim to reduce both the likelihood and consequences of bushfires. Broad strategies to achieve this aim are summarised in Table 9 and detailed in the following subsections.

Implementation of these strategies provides an effective way of minimising the risk to natural and built assets within the BMP area. However, as no development can be guaranteed to be entirely safe from bushfires, providing an acceptable level of protection and a tolerable residual risk, is to some extent a compromise between the level of threat, inconvenience, dangers, ability or practicality of implementation and costs (financial and environmental) involved in providing the protection. Typically, the best outcomes are achieved where neighbouring properties and CCC cooperate to provide bushfire protection measures. Beyond the implementation of this BMP, bushfire extension programs (Section 5.7) are ways that this cooperative approach may be achieved.

Table 9: Bushfire risk reduction strategies and actions

Strategy	Actions
Avoid the risk	Building and development controls and prohibiting certain developments near hazards
Reduce the hazard	Reduce the level of fuel available to burn in a bushfire Manual clearing of bushfire fuels and provision of asset protection zones Prescribed burning of bushfire fuels and provision of strategic fire advantage zones.
Reduce unplanned ignition	Local bushfire education and extension programs Communications regarding Total Fire Ban days and burn permits
Reduce vulnerability	Establishment and maintenance of Asset Protection Zones for the protection of built assets in and around the BMP area. Development and implementation of cooperative and complimentary fire management strategies with neighbours and adjoining residences.
Understand and accept residual risk	Manage with early detection and fire suppression operations Maintenance of existing access routes to facilitate suppression of fires

5.1 Bush Fire Management Zones

Bush fire management zones are based on the location of assets, topography, land use and potential bushfire hazard (Section 3 above) and risk (Section 4 above). Bush fire management zones are separated into the following four categories based on the Bushfire Environmental Assessment Code (NSW RFS 2006):

- Asset Protection Zone (APZ);
- Strategic Fire Advantage Zone (SFAZ);
- Fire Exclusion Zone (FEZ); and
- Land Management Zone (LMZ).

Bush fire management zones have been identified and mapped across the BMP area to provide a planning framework in which to protect life, property and the environment. These zones are mapped in Figure 6. The aim, specifications and management of each of these management zones is described in Table 10 to Table 13 below.

Table 10: Asset Protection Zone

Asset Protection Zone Details	
Aim	To provide a fuel free zone between the asset in question and the nearby bushfire hazard to protect from direct flame attack and facilitate firefighting access
Specifications	See Section 5.2 below.
Management	Vegetation within the APZ is managed at a high intensity to minimise the fuel available to a bush fire. As a minimum, APZs are to be treated on an annual basis.

Table 11: Strategic Fire Advantage Zone

Strategic Fire Advantage Zones	
Aim	To provide a strategic area of fire protection advantage in which to reduce speed, intensity, spotting potential of bushfires and aid in bushfire containment.
Specifications	Area managed primarily for fuel reduction purposes.
Management	Provide for a mosaic fuel reduction pattern and reduce fuels below a high hazard level.

Table 12: Fire Exclusion Zone

Fire Exclusion Zone Details	
Aim	To maintain biodiversity and aesthetics
Specifications	Fire to be excluded from these zones
Management	Suppress all wildfires Long term weed suppression

Table 13: Land Management Zone

Land Management Zones	
Aim	To manage land primarily for conservation.
Specifications	Area managed primarily for environmental purposes.
Management	Long term weed suppression (minimum annual weed removal). Consider the implementation of ecological burns following fuel hazard assessments where applicable.

5.2 Asset protection zones

The threat from flame contact and radiant heat to property, assets and thereby persons in and adjacent to the BMP area can be significantly reduced by the establishment and maintenance of APZ at the locations displayed within Table 10, and Figure 6. APZ dimensions have been determined with consideration of:

- Planning for Bush Fire Protection (2019)
- existing APZ's
- adjoining Endangered Ecological Communities
- the Bush Fire Environmental Assessment Code (NSW RFS 2006)
- a field-based assessment of pre-existing conditions (*i.e.* existing fire breaks, fire trails, managed land, public roads)
- the existing residential setback.

5.2.1 Vegetation/Fuel Management Prescription within APZ

The APZ is managed progressively to minimise fuel loads and reduce potential radiant heat levels, flame, smoke and ember attack. The majority of vegetation within the BMP area is classified as both Forest and Woodland. This vegetation can be managed in the APZ as an IPA and OPA. Management of onsite APZs to OPA standard is appropriate given the bushfire risk profile of the reserves.

When establishing and maintaining an IPA the following requirements apply:

Trees:

- canopy cover should be less than 15% (at maturity) trees (at maturity) should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above ground;
- canopies should be separated by 2 to 5m;
- preference should be given to smooth barked and evergreen trees.

Shrubs:

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover;
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass:

- should be kept mown (as a guide grass should be kept to no more than 100mm in height) leaves and vegetation debris should be removed.

When establishing and maintaining an OPA the following requirements apply:

Trees:

- tree canopy cover should be less than 30%;
- trees should have canopy separation by 2 to 5m

Shrubs:

- shrubs should not form a continuous canopy;
- shrubs should form no more than 20% of ground cover.

Grass:

- should be kept mown (as a guide grass should be kept to no more than 100mm in height) leaf and other debris should be mown, slashed or mulched.

Table 14: Bushfire hazard assessment and APZ requirements

APZ Location	Direction	Slope ¹	Vegetation ²	PBP required APZ (PBP 2019) ³	Proposed APZ	Comment
Alpha Road Greystanes(off Alpha Rd Park).	South	0° to 5° downslope	Woodland	16m	5m	Fragmented elongated woodland vegetation corridor east to west direction. Maintain existing mowed grass APZ to EEC boundary demarcation posts. Further APZ extension has potential impact on EEC.
Hyland Road Greystanes	South	0° to 5° downslope	Forest	29m	18m	Existing APZ comprising of residential setbacks and existing public road system to EEC.
Hyland Road Greystanes	West	0° to 5° downslope	Forest	29m	10m	Maintain existing mown APZ behind rear of houses to riparian area.
Munro Street Greystanes	Northwest/orth/North East	0° to 5° downslope	Forest	29m	20m	Maintain existing mown APZ behind rear of houses to riparian area.
Bilpin Street Greystanes	North	Flat to upslope	Woodland	12m	10m	Maintain existing mown APZ behind rear of houses to perimeter of EEC.
Bilpin Street Greystanes	West/South West	Flat to upslope	Woodland	12m	80m	Maintain existing mown APZ behind houses.
Gipps Road/ Greystanes Road Greystanes	West	Flat to upslope	Woodland	12m	30m	Existing APZ comprising of residential setbacks and existing public road system to EEC (Grey Box Reserve).
Gipps Road (south of Hyland Rd) Greystanes)	West	0° to 5° downslope	Forest	Not defined for industrial	30m	Existing APZ comprising of industrial development setbacks and existing public road system to EEC.
Silverthorne Drive Pemulwuy	South West	>10°-15° downslope	Woodland	25m	20m	Existing APZ comprising of residential development setbacks and existing public road system to EEC.
Bundeluk Ave Pemulwuy	South	>5°-10° downslope	Woodland	20m	24m	Existing APZ comprising of residential development setbacks and existing public road system to EEC.

APZ Location	Direction	Slope ¹	Vegetation ²	PBP required APZ (PBP 2019) ³	Proposed APZ	Comment
Daruga Avenue Pemulwuy	West	Upslope	Forest (Disturbed)	24m	20m	Existing APZ comprising of residential development setbacks and existing public road system to heavily disturbed exotic / native forest.

¹ Slope most significantly influencing the fire behaviour of the site having regard to vegetation found. Slope classes are according to PBP.

² Predominant vegetation is identified, according to PBP and "Where a mix of vegetation types exist the type providing the greater hazard is said to be predominate".

³ Assessment according to PBP 2019 Table A1.12.2-residential development

5.3 Strategic Fire Advantage Zones

There is one Strategic Fire Advantage Zone (SFAZ) proposed in a portion of Grey Box Reserve. The SFAZ is bounded to the west by an internal vehicle track, south by an APZ off Bilpin Street, east off Greystanes Road and to the north Watkin Tench Parade. The SFAZ protects, together with adjoining APZ, up to 30 residential properties on the urban/bushland interface. The specifications for this SFAZ are detailed in Table 11 and are proposed to be achieved by prescribed burning.

5.4 Fire Exclusion Zones

There is only one Fire Exclusion Zone (FEZ) within the BMP area and it is an area located west behind residential properties on Gipps Road and bounded on the south by Hyland Road. This area has been designated as a FEZ to protect the EEC Coastal Freshwater Wetland within the BMP area in accordance with recommended fire intervals for each vegetation type (Section 6.2)

5.5 Land Management Zones

All of the remaining parts of the BMP area after APZ, SFAZ and FEZ are taken out are to be managed as LMZ. These areas are to be maintained towards the upper end of their respective fire intervals and only burned for ecological purposes in the unlikely event that there is insufficient wildfire in the BMP area in the future. No prescribed burning is proposed in the LMZ during the life of this plan.

5.6 Access

Primary access to bushfires by emergency fire services is likely to be via the Prospect Hwy, Widemere Road, Hassall Street, Gipps Road, and Greystanes Road. All are suited for all categories of fire appliance.

Other access points are present for fire services including secondary public access roads (Hyland Road, Munro Street, Bilpin Street, Watkin Tench Parade, Silverthorne Drive, Bundeluk Ave, and Daruga Avenue), concrete cycleways, and using vehicle trails (Prospect Hill and Grey Box Reserve).

A large majority of direct access into the BMP area is restricted to the public with cyclone fencing and locked gate access. Other access restrictions include concrete bollards off Bundeluk Avenue and Silverthorne Drive.

Where unmanaged CCC land directly adjoins existing industrial estate behind Alpha Road, Dahlia Street, and Gardenia Parade Greystanes it is recommended that a 1m to 2m pedestrian slashed access path (gated as required) be constructed and/or maintained for fire fighting pedestrian access purposes. All tree overstorey should to be retained.

Apart from the above, this BMP does not recommend the establishment of any other additional access provisions; with all remaining existing tracks and access points to continue to be maintained in support of land management practices.

5.6.1 Proposed Access/Usage Restrictions

The scout hall located within the Boothtown Reserve area, is accessed by a track from Gipps Road through bushfire prone vegetation. There is a risk to users of this facility, particularly on days of elevated

fire danger. Therefore, it is proposed that a usage restriction be placed on the scout hall such that it is not occupied on days where the Fire Danger Rating is forecast to be Catastrophic or Extreme.

5.7 Education and extension programs

The maintenance of APZs as proposed in this BMP provides a significant improvement in the protection of community assets adjoining the BMP area. Despite the management of bushfire risk in the subject BMP, assets within adjoining lands cannot be totally protected without complimentary bushfire protection activities. Education/extension programs by CCC, NSW RFS, and FRNSW should be conducted to facilitate this process.

The objective of extension programs is to effectively share the fire management responsibility among the neighbouring residents and local community by providing information, raising awareness and improving their fire management capabilities. Readiness and awareness of the community is vital to ensure the safety of people and the preparation of their dwellings and assets. To achieve this objective, it is recommended that CCC implement the following initiatives:

- Relevant bushfire management works undertaken within the BMP area should be advertised to neighbours and to relevant stakeholder groups
- Support community groups who have an interest in the BMP. Community based groups offer an effective means to raise awareness of fire related issues and encourage public cooperation and participation in fuel management practices
- In conjunction with local fire brigades, undertake advertising and other community-awareness campaigns aimed at reducing the frequency of bushfires, increasing asset protection, and providing safe bushfire response behaviour
- Council works with its Community Engagement Team to encourage residents to prepare dwellings, assets and bushfire survival plans
- Use signs within the BMP area, leaflets, displays and other available interpretative media to disseminate fire related messages.

It is recommended that CCC produces its own interpretative media (leaflets, displays, signs) that focuses on encouraging private/personal ownership of fire management whilst also promoting appreciation of the community's natural and cultural resources within the BMP area. In the interim, CCC should liaise with NSW RFS and FRNSW to investigate opportunities currently available.

6. Protection of Environmental and Cultural sites

The BMP has identified operational guidelines, to reduce impacts on the environment which are to be followed when carrying out the activities identified in the BMP. These operational guidelines are detailed in the following subsections.

6.1 Fuel/Vegetation Reduction Operations

During the establishment and maintenance of APZs within the BMP, the following tree and vegetation clearing, and management operations should be followed to protect soils, landscape features, and conservation values:

- Scrub cutters and hand tools are the most satisfactory equipment for hazard reduction operations. Only this type of minimum impact equipment should be used;
- Threatened flora species or EEC under the TSC Act or *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) must not be removed or damaged. In order to minimise the risk of damage to these species or communities, surrounding vegetation is to be removed by hand only;
- The use of bulldozers or other track type machinery should not be permitted;
- Cut vegetative material (with the exception of noxious and environmental weeds) and ground fuel, leaves, bark, twigs, grass tussocks etc. may be mulched and spread to help prevent weed invasion and soil erosion;
- Removal by hand is permissible on all slopes while mowing will not be undertaken on slopes greater than 15°.

6.2 Threatened species management

Potential threats to threatened communities and species were described in Section 3.5.2. One of the main threats was competition from weeds. Competition from weeds is often heightened after fire. Weed control works in EECs are recommended after wildfire (Section 6.3) and no new access tracks are proposed.

To avoid inappropriate fire regimes and ensure protection of vegetation communities, fire management must avoid the incidence of high frequency and high intensity fires, and any future prescribed burns should only be undertaken in accordance with the recommended fire intervals for each vegetation type (Table 15 below), and following a detailed fuel hazard assessment of the vegetation. Low intensity prescribed burning is recommended as part of this BMP (see also Section 5.3).

Table 15: Recommended Fire Intervals for Vegetation Communities within the BMP area (NPWS 2009)

Vegetation Type (Specht)	A decline in biodiversity is predicted if (NPWS 2004):
Woodland	Minimum interval: more than one fire every 5 years. Maximum interval: no fire for more than 40 years
Forest	Minimum interval: more than one fire occurs every 7 years. Maximum Interval: no fire for more than 30 years
Freshwater Wetlands	Minimum interval: more than one fire every 7 years. Maximum interval : no fire for more than 35

6.3 Weed management

Weed control activities being undertaken in the BMP area can play an important role in achieving not only weed management objectives, but also bushfire protection outcomes. By focusing weed control activities in areas which may provide additional bushfire protection outcomes, dual benefits can be gained. For example, choosing a site for weed control works which is adjacent to a FEZ may offer some benefits in reducing fuel loads and influencing fire behaviour, whilst still achieving weed management objectives.

Where fuel/vegetation reduction and access construction and maintenance works occur, all vehicles and machinery likely to disturb the soil should be cleaned prior to, during and after these activities to reduce the spread of weeds.

As bushfires may exacerbate weed infestations, it is recommended that weed control occurs within 6 months of any bushfire. Table 16 outlines safeguards to reduce the spread of weeds during fire management activities.

Table 16: Safeguards when carrying out fire management activities in sites containing exotic plant species

Potential impact	Possible safeguards (or ameliorative measures) to mitigate the impact
Exotic seeds introduced on machinery and boots during fire management activities	Wash down all vehicles and machinery likely to disturb the soil prior to, during and after APZ maintenance or trail maintenance activities. Vehicles and machinery regularly used in wildfire suppression should be thoroughly cleaned on a regular basis. Carry out weed management following the fire management activities.
Weed distribution and abundance increased as a result of fire management activities	Carry out weed control following the fire management activities. Avoid movement through weed infested areas. Wash down all vehicles and machinery that are likely to disturb the soil during trail maintenance activities.

6.4 Protection of cultural sites

To reduce the potential impact on unidentified cultural sites, the following operational guidelines should apply during fire suppression operations and access trail maintenance works:

- In the event of fire management activities disturbing or damaging an unrecorded site, DPIE must be informed;
- In the event of an unrecorded site being found during fire suppression operations, action should be taken to avoid damage to the site and it must be reported to the incident controller and DPIE;
- All post-fire reports are to consider the effects of the fire on Aboriginal and historic sites and where necessary recommend ameliorative action;
- Where known, sites are to be protected with appropriate protection structures (e.g. strong temporary fences and bold signage) during vegetation removal and fire trail maintenance operations; and
- As vegetation cover is reduced and the possibility of finding sites is increased, post-bushfire inspections and surveys may be considered relevant.

7. Work Schedule

Proposed actions within this BMP are given priority using the rating system in Table 17 below. This system is based on an effort/impact ratio where preventative actions that occur regardless of the BMP and/or are inexpensive to implement are given a higher priority rating and actions that require a considerable injection of funds without immediate impacts are rated much lower.

Tables 17 - 23 summarise the works required to achieve the bushfire management objectives of the Plan and should be read in conjunction with Figure 6. The fire management activities identified here are to be implemented in accordance with any additional requirements of CCC and the environmental protection safeguards detailed in Section 6.

Table 17: Action Priority Rating System

Priority	Meaning	Reason
High (1)	Critical action – must be done	<p>Actions prevent the occurrence of fires and/or prevent the creation of additional risk.</p> <p>Actions aim to protect significant tangible assets from bushfire (e.g. buildings, relics, threatened species).</p>
Medium (2)	Should be done	Actions that facilitate the suppression of bushfires.
Low (3)	To be undertaken when other actions are complete	Actions aim to extend bushfire management to adjoining lands to increase protection of neighbouring properties.

Table 18: Summary of fire management actions - Asset Protection Zone

ID	Key Actions	Responsibility		Frequency	Priority	2020	2021	2022	2023	2024
1	Continued maintenance of APZs to required standard	Cumberland Manager of Open Space	Council	Quarterly	1	✓	✓	✓	✓	✓
2	Annually monitor fuel loads within the APZ prior to the bushfire season and at least once mid-way through the bushfire season. Implement works as needed to ensure the APZ standard is maintained	Cumberland Manager of Open Space	Council	Twice annually	1	✓	✓	✓	✓	✓

Table 19: Summary of fire management actions – Strategic Fire Advantage Zones

ID	Key Actions	Responsibility		Frequency	Priority	2020	2021	2022	2023	2024
3	Conduct prescribed burning within strategic fire advantage zones in combination with Fire and Rescue NSW	Cumberland Manager of Open Space	Council	Within required fire interval	1	Undertaken within the 5-year lifespan of this Bushfire Management Plan.				
4	Post burn assessment to review burn objectives met.	Cumberland Manager of Open Space.	Council	Once	2	Within 2 weeks of burn completion date.				

Table 20: Summary of fire management actions - Land Management Zones

ID	Key Actions	Responsibility		Frequency	Priority	2020	2021	2022	2023	2024
5	Conduct post-fire pest and weed control operations.	Cumberland Manager of Open Space.	Council	Once.	1	6 months after bushfire event (June 2020)				
6	Conduct post-fire surveys to assess the impacts on threatened species and EECs.	Cumberland Manager of Open Space.	Council	Once	2	Within 6 months after bushfire event (June 2020)				

Table 21: Summary of fire management actions – Fire Exclusion Zone

ID	Key Actions	Responsibility	Frequency	Priority	2020	2021	2022	2023	2024
7	All possible steps taken to prevent fire should it occur in this zone	Cumberland Council Manager of Open Space in conjunction with Fire Response Agencies	Ongoing	1	✓	✓	✓	✓	✓

Table 22: Summary of fire management actions – access and egress

ID	Key Actions	Responsibility	Frequency	Priority	2020	2021	2022	2023	2024
8	Establish and/or maintain pedestrian access for fire fighting personnel to Industrial Estate adjoining Alpha Road Greystanes	Cumberland Council Manager of Open Space.	Annually	3	✓	✓	✓	✓	✓
9	Establish usage restrictions for the Scout Hall as per Section 5.6.1	Cumberland Council Manager of Open Space.	Once & annually thereafter	2	✓	✓	✓	✓	✓

Table 23: Summary of fire management actions - community engagement

ID	Key Actions	Responsibility	Frequency	Priority	2020	2021	2022	2023	2024
10	Facilitate community engagement activities within BMP area	Cumberland Council Manager of Open Space in conjunction with Place and Engagement and fire authorities.	Annually	3	✓	✓	✓	✓	✓

8. Environmental Assessments Requirements

The environmental assessment for proposed works within APZs or SFAZs (for those areas not containing EEC's) may be obtained using the Bush Fire Environmental Assessment Code (RFS 2006) and the Hazard Reduction Certificate process (Section 1.4.3).

Alternatively, as a Public Authority, CCC may prepare and approve proposed Hazard Reduction works for land under CC's care and control by undertaking a Review of Environmental Factors process under Part 5 of the *Environmental Planning and Assessment Act 1979*.

9. Monitoring and Evaluation

All strategies and plans must have mechanisms that show that progress is being made in dealing with the problem or it is successfully completing the prescribed actions. It is also necessary to determine the effectiveness of the plan and efficiency of individual actions.

9.1 Monitoring and evaluation

Monitoring should occur at both the management level and biodiversity level. Monitoring at the biodiversity level, however, usually involves analysis of environmental stress and response of indicator species (e.g. threatened species), biotic composition, life history studies, and distress syndromes (e.g. the effect of fire or lack of fire). This level of monitoring is not considered necessary due to the lack of baseline data and the amount of resources it usually takes to undertake this work. Monitoring for management purposes should therefore be carried out to ensure that the actions listed in Tables 17 to 21 are being carried out and the objectives are being achieved.

Monitoring and evaluation against the actions and timeframes outlined in the Work Schedule (Section 7) are effective way to monitor the implementation of the BMP.

9.2 Review of the plan

A complete evaluation, review and updating of the BMP should occur every 5 years. The review should:

- consider whether the BMP has achieved the objectives set out in Section 1.5;
- reassess the strategies and environmental safeguards considering current research and management best practice; and
- reassess the strategies considering of legislative changes, financial constraints, social philosophies, improvements in bushfire protection and suppression, and changes in vegetation.

Annual reviews of the BMP may be done when preparing annual works programs. Small changes to the actions and strategies may occur within the BMP without formally discussing the changes with NSW RFS. Matters that require a more significant variation (such as identifying a need for prescribed burning for hazard reduction or biodiversity outcomes) should be discussed with NSW RFS and any affected stakeholders.

Further, Section 3.5.1. notes proposed future residential development within the current plan area. Following construction of these developments, it is recommended that CCC undertake to review this plan.

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BMP Maps

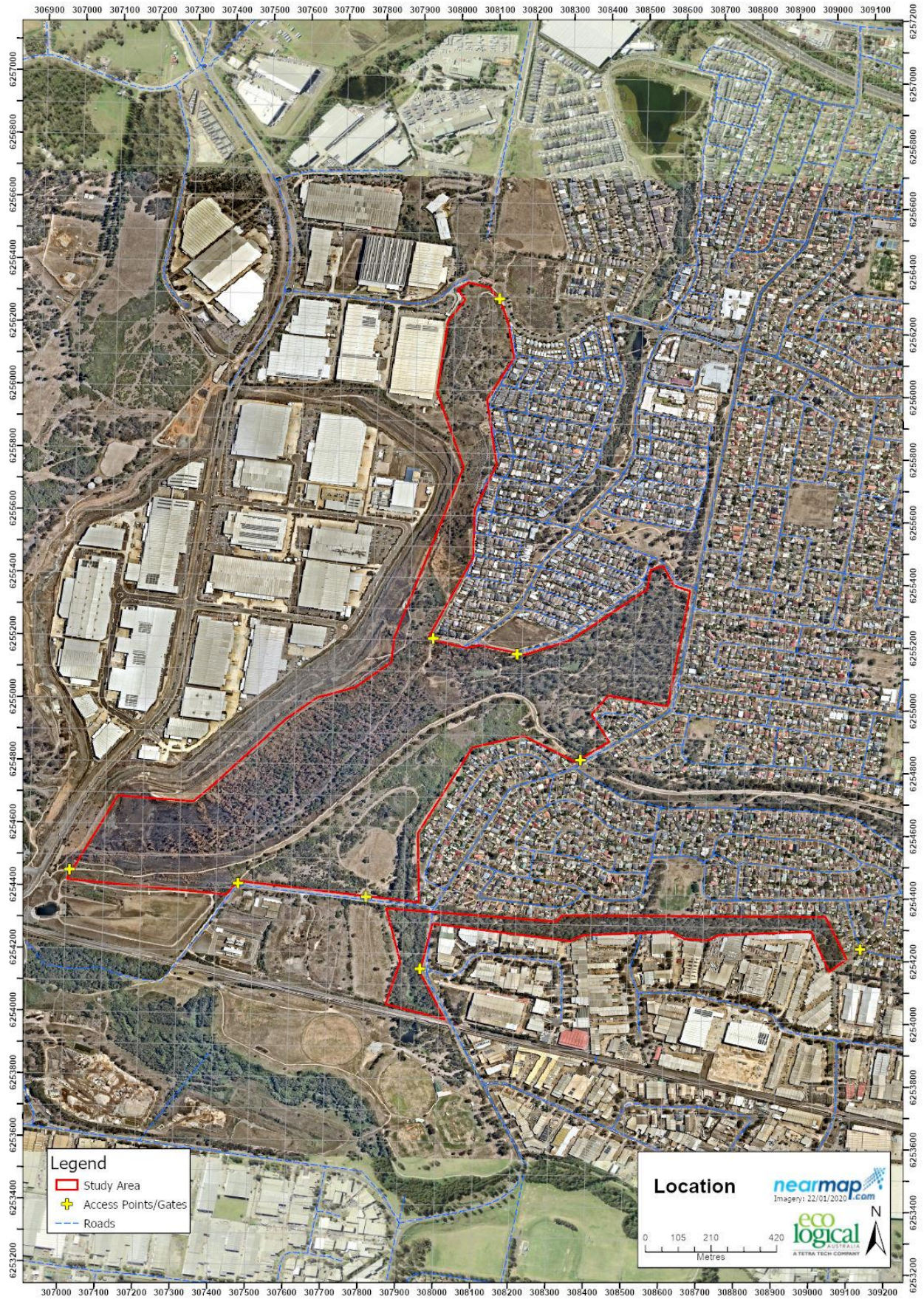


Figure 1: Location



Figure 2: Draft Bushfire Prone Vegetation and Land mapping (yet to be certified)

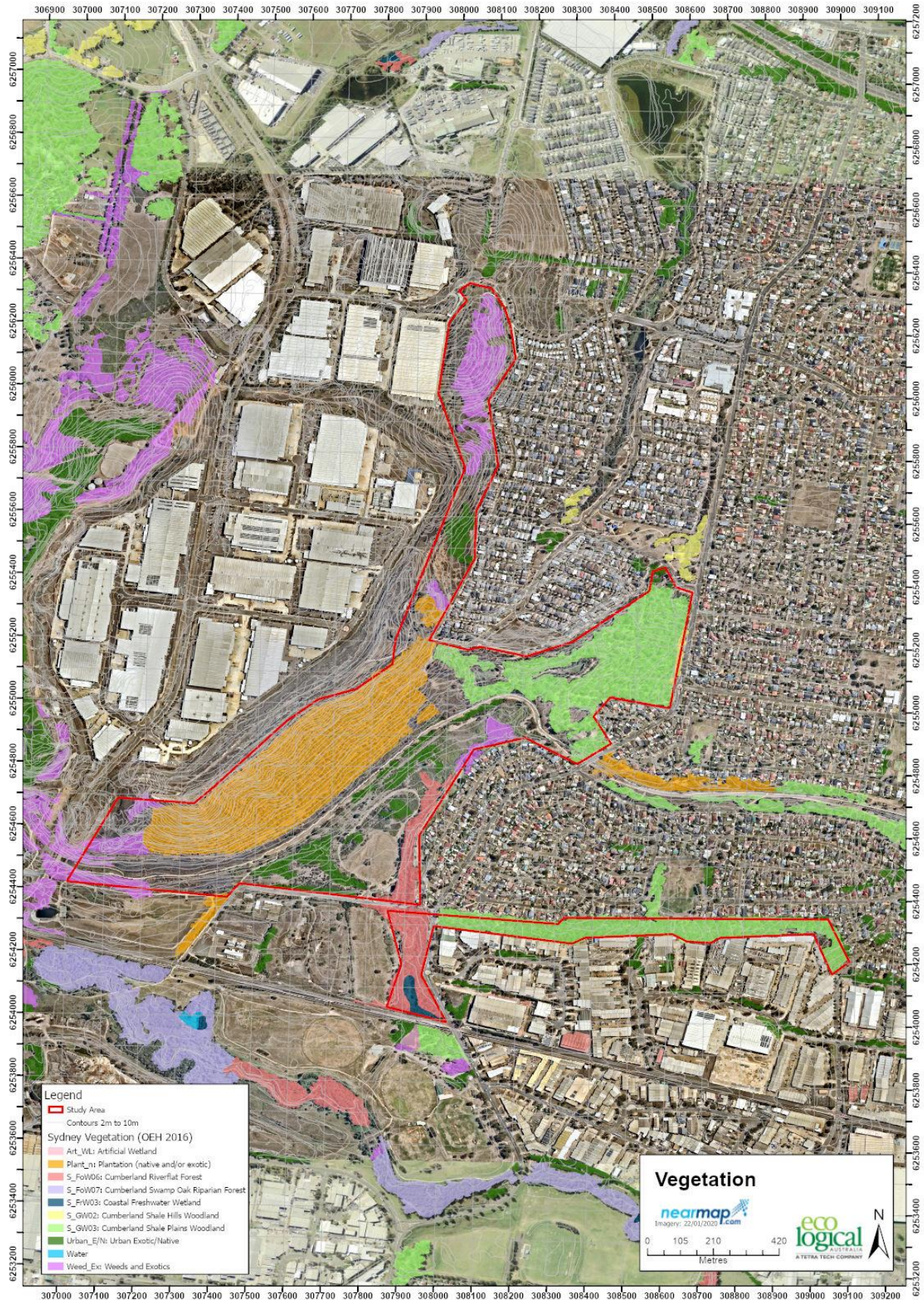


Figure 3: Vegetation Mapping



Figure 4: Threatened Species



Figure 5: Cultural Heritage

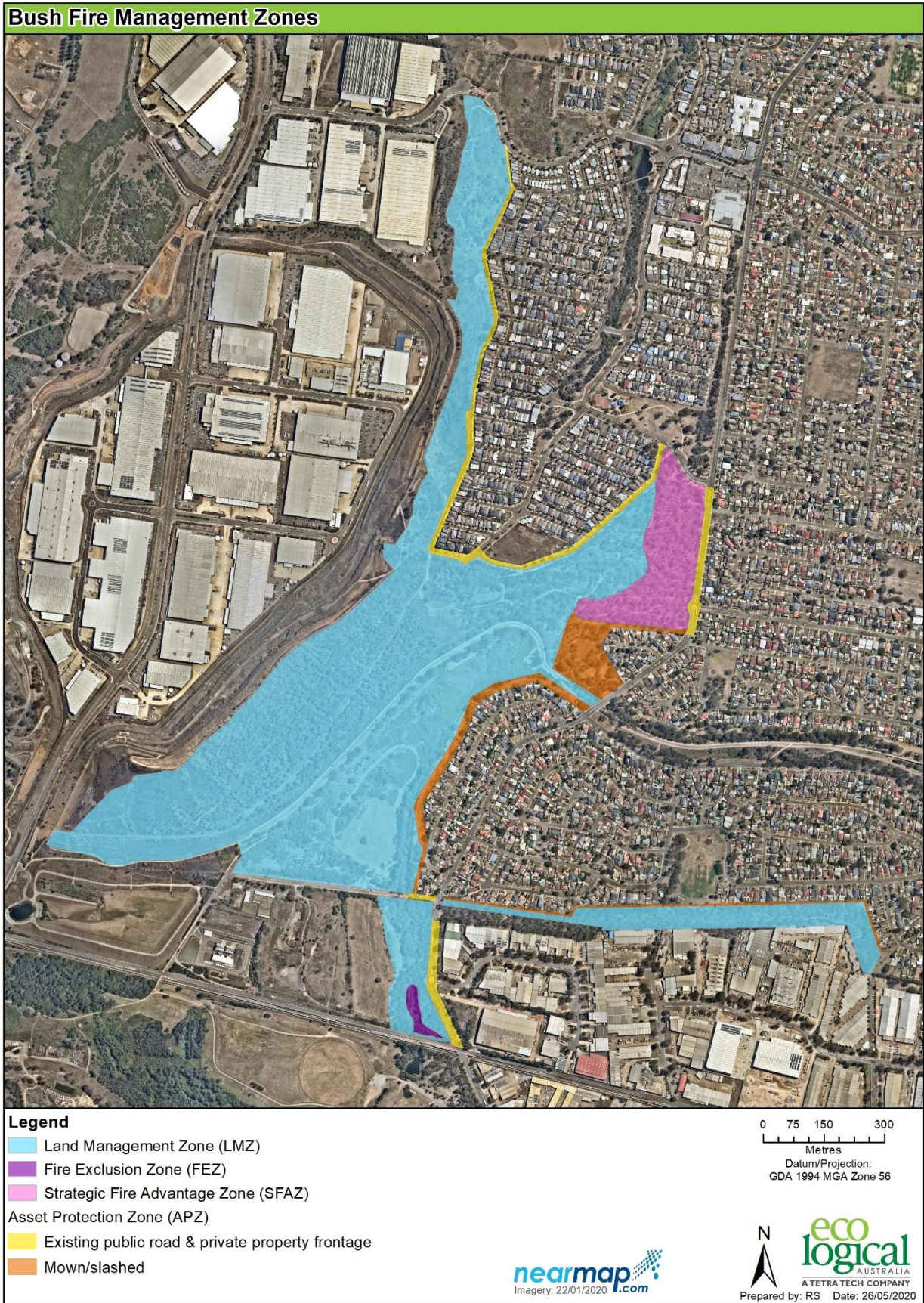


Figure 6: Bush Fire Management Zones

