NSW National Parks and Wildlife Service

Blue Mountains National Park and Kanangra-Boyd National Park

Planning considerations

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Acknowledgement of Country

The parks covered in this report are part of an ancient landscape that includes the Aboriginal people. The areas now known as Blue Mountains National Park and Kanangra-Boyd National Park and their surrounding lands and connecting watercourses have traditionally been under the care of the Gundungurra, Dharug, Wiradjuri, Dharawal and Darkinjung Aboriginal peoples. Aboriginal people have a deep spiritual and cultural connection to this Country. Their ancestors have lived here for thousands of years, and in doing so, form part of this living landscape.

Connections to Country and the significance of these parks to Aboriginal peoples – past, present and future – are acknowledged and respected. NSW National Parks and Wildlife Service acknowledges and supports the role of Aboriginal people in identifying traditional connections and custodians for this place.

What is 'Country'?

'Country' refers to all parts of the natural environment and these parts cannot be separated. This means that the land, water, animals and plants are viewed as one, and they form Aboriginal peoples' cultural and spiritual identity.

Aboriginal people develop intimate knowledge and connections with places, animals, plants and landscapes which create an interdependence with nature that is based on respect. Aboriginal people care for Country through ceremony, cultural activities, sharing stories of songlines and maintaining connections with the world around them.

Photo 1 Kanangra-Boyd National Park. Simone Cottrell/DCCEEW

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How to use this report

This planning considerations report outlines the matters considered in preparing the *Blue Mountains National Park and Kanangra-Boyd National Park plan of management* (NPWS 2024), including the parks' key values, management principles and management considerations. Further information is provided in the appendices, including scientific names for common names of species (Appendix A).

It is recommended that readers of this report also read the plan of management.

The plan of management describes the objectives for the parks' values and the operations that the National Parks and Wildlife Service (NPWS) proposes to undertake to achieve these objectives. It also sets out the recreational and commercial activities that are permitted in the parks and any requirements to undertake these activities, including whether consent must be sought from NPWS to undertake them.

This planning considerations report may be updated when appropriate, for example, if we have new information on:

- the values of the park, for example, new threatened species
- management approaches, for example, new feral animal or weed management techniques
- new programs.

Acknowledgements

NPWS acknowledges the Blue Mountains and Kanangra-Boyd national parks and their surrounding lands and connecting watercourses are the Country of Aboriginal custodians who continue to maintain a connection and care for the lands in the national parks.

This report was prepared by staff of NPWS, in consultation with the Blue Mountains Regional Advisory Committee, Greater Blue Mountains World Heritage Area Advisory Committee, Gundungurra Indigenous Land Use Agreement parties and WaterNSW.

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1. Blue Mountains and Kanangra-Boyd national parks

1.1 Overview of the parks

Blue Mountains and Kanangra-Boyd national parks (referred to as 'the parks' in this report) occupy a total area of 344,045 ha and protect more than a third of the Greater Blue Mountains Area World Heritage property, which is also recognised as National Heritage. The parks and their surrounding lands and connecting watercourses have traditionally been under the care of the Dharug, Gundungurra, Wiradjuri, Dharawal and Darkinjung Aboriginal peoples; and Aboriginal people have cared for this Country for thousands of years.

The parks extend from the coastal lowlands of the Cumberland Plain to the western fall of the Great Dividing Range (Figure 1) and are a significant portion of one of the largest, most continuous areas of protected bushland in New South Wales (NSW). The parks straddle the South Eastern Highlands and the Sydney Basin bioregions (Box 1) (NPWS 2003a).

Box 1: What are bioregions?

Australia is divided into bioregions. Bioregions are relatively large land areas characterised by broad, landscape-scale natural features and environmental processes that influence the functions of entire ecosystems. The Sydney Basin bioregion covers about 4.53% of New South Wales and is one of the most species-diverse bioregions in Australia because of its variety of rock types, topography and climates. The South Eastern Highlands bioregion covers about 6.11% of the state.

Adjoining NPWS reserves include Mulgoa and Wiarborough nature reserves; Yellomundee and Yerranderie regional parks; Gardens of Stone, Burragorang, Yerranderie and Nattai state conservation areas; Abercrombie River, Nattai, Mares Forest and Wollemi national parks; and Wombeyan and Jenolan karst conservation reserves (Figure 1).

The parks include approximately 141,700 ha that are managed jointly by NPWS and WaterNSW. These lands are known as 'special areas' under the *Water NSW Act 2014*. An integrated management approach for these areas has been adopted and a joint management plan sets out long-term management goals for the protection of water quality and ecological integrity within catchment areas (WaterNSW and OEH 2015).

The parks are in the administrative areas of the Bathurst, Deerubbin, Pejar and Tharawal local Aboriginal land councils, 3 NSW Local Lands Services regions (Greater Sydney, Central Tablelands, South East) and 7 local government areas (Hawkesbury, Blue Mountains, Lithgow, Oberon, Wollondilly, Upper Lachlan and Penrith).

1.1.1 Blue Mountains National Park

Blue Mountains National Park (269,332 ha) was first declared on 25 September 1959 under the *Crown Lands Consolidation Act 1913* and later re-established under the *National Parks and Wildlife Act 1974* (NPW Act).

Figure 1 Location of the parks

The formal protection of Blue Mountains National Park began in the late 1800s, with the declaration of a small number of 'sights reserves' encompassing some of the escarpment of the Grose and Jamison valleys, while the lands of the Grose and Govett gorges and the plateaus above were reserved from further sale (Macqueen 2007). By the 1920s, a proposal for a Greater Blue Mountains National Park was being prepared by bushwalker and visionary conservationist Myles Dunphy. Realisation of Dunphy's original vision eventually began in 1959, when the first stage of the Blue Mountains National Park was officially declared. The area concerned, about 63,000 ha, lay mostly within the catchments of the Grose and Colo rivers and of Bedford and Glenbrook creeks, and was entirely outside the Warragamba catchment area. Between 1959 and 1971 the park was managed by the Blue Mountains National Park Trust and grew from 63,000 ha to 110,000 ha. The park was re-established on 1 October 1967 under the *National Parks and Wildlife Act 1967* and NPWS began managing the park in 1971. Numerous significant additions were subsequently made, including a large area of the Warragamba catchment in 1977.

The reservation of some sections of the park (totalling about 16,385 ha) is depth-limited by between 15.24 and 152.4 m. This means that certain activities may occur beneath these parts of the park even if they are not consistent with the management principles for national parks or the objects of the NPW Act.

In 2023 the park measures 269,332 ha, more than 4 times the size of the original park in 1959. In 2000, almost all of the Blue Mountains and Kanangra-Boyd national parks were formally inscribed as part of the Greater Blue Mountains Area World Heritage property.

1.1.2 Kanangra-Boyd National Park

Kanangra-Boyd National Park was first declared on 3 December 1969 under the *National Parks and Wildlife (Amendment) Act 1969*. The area concerned was about 39,700 ha. It has since nearly doubled to 74,713 ha in 2023.

The establishment of Kanangra-Boyd National Park had also commenced in the late 1800s, when, on 11 April 1891, Kanangra Walls was established as a public recreation reserve. In 1937, large parts of the current park were declared a reserve for the protection of flora and fauna, but it was not until 1969 that Kanangra-Boyd National Park was officially protected from activities such as mining or forestry.

The park was consolidated in the 1970s with the addition of around 40,000 ha of high conservation value areas, including Mount Armour and most of the Boyd Plateau. This addition followed 2 sustained campaigns by bushwalkers, cavers and the wider community led by a group then known as the Colong Committee (now Wilderness Australia). These campaigns opposed the proposed mining of the limestone caves in the area, including Colong Caves (from which the Colong Committee obtained its name), and the clearing of the Boyd Plateau to establish pine plantations.

Unlike Blue Mountains National Park, no part of Kanangra-Boyd National Park is depth limited.

1.2 Social and economic context

The World Heritage listing of the parks gives them international status, and their location on the western edge of Greater Sydney positions them well for both international and domestic visitation. In 2020, the global pandemic changed park visitation sources and patterns, highlighting and reinforcing the social and health benefits of the parks to residents of Greater Sydney and New South Wales.

Blue Mountains National Park is the most visited park in New South Wales, with an estimated 8.4 million visits in 2018. This was a significant increase in visitation in the 10 years since 2008, when there were 3.6 million visits to the park. The population of Greater Sydney is projected to grow to over 8 million over the next 40 years, and almost half of that population will reside west of Parramatta. The parks have been identified as playing a critical role of providing protected areas for the western part of the city, including Greater Penrith and Western Sydney Airport – Badgerys Creek Aerotropolis (Greater Sydney Commission 2021). Managing increasing visitation pressure in a sustainable way is one of the current and future challenges for park managers.

With the majority of people visiting the Blue Mountains region to experience nature and protected areas, the parks make a significant contribution to the economy of the region.

In addition to their recreation value, the parks provide other social benefits, including providing surrounding communities with opportunities to participate in volunteer environmental programs such as bush regeneration and other land rehabilitation activities. The parks have social value through their role in inspiring both the development of the conservation movement in New South Wales and the continued emergence of environmental advocates.

1.3 Legal overlays

Almost all of the Blue Mountains and Kanangra-Boyd national parks are part of the Greater Blue Mountains Area World Heritage property (see Box 2), which is also recognised as National Heritage. The parks contain significant areas of wilderness, occupy a large part of the Sydney Drinking Water Catchment, and are one of the key attractions in a major tourism region. As a result, the management of these parks sits within a broader landscape planning context. See Figure 2.

Management of these parks is subject to the provisions of the NPW Act and its regulation (currently the National Parks and Wildlife Regulation 2019 [NPW Regulation]) and other NSW and Commonwealth legislation. There are declarations under other NSW and Commonwealth Acts that establish a legislative framework for the management of these parks.

1.3.1 Gundungurra Indigenous land use agreement

Indigenous land use agreements (ILUA) are agreements made under the Commonwealth *Native Title Act 1993* between a native title group and a relevant body such as government (either the Australian Government or relevant state or territory government) or another party (e.g. a mining company). These agreements may be used to resolve native title claims and establish access and management arrangements between native title claimants and other landowners within a claim area.

The Gundungurra ILUA was registered with the Native Title Tribunal in February 2015 after being signed in 2014 by the Gundungurra People and all relevant government agencies and NSW Ministers (OEH 2014a). The ILUA acknowledges the Gundungurra People's custodianship, use and management of their traditional land and waters across an area of about 6,942 km^2 (694,200 ha). The agreement area encompasses 21 parks, including parts of Blue Mountains and Kanangra-Boyd national parks (see Figure 1). A ceremonial signing and celebration was held in Katoomba in June 2015.

The ILUA is a 'non-native title' agreement, with the claimants agreeing to withdraw their native title claim on registration of the agreement. The Gundungurra People are non-exclusively recognised as being appropriate people to be engaged to provide heritage advice to NSW Government authorities for land covered by the agreement area.

Management considerations and opportunities

The ILUA has established a Gundungurra Consultative Committee that may make recommendations to NPWS on the care, control and management of the parks and reserves in the agreement area.

In accordance with the ILUA, the Gundungurra ILUA parties must be notified of a range of matters (as identified in the agreement), including the preparation, adoption and implementation of a plan of management for any part of the agreement area.

1.3.2 Greater Blue Mountains Area World Heritage property

The Greater Blue Mountains Area was inscribed on the World Heritage List in 2000 for its Outstanding Universal Value, meaning its natural significance is so exceptional 'as to transcend national boundaries and to be of common importance for present and future generations of all humanity' (UNESCO 2021a).

Box 2: What is World Heritage?

World Heritage listing is the highest level of international recognition that may be afforded to an area, acknowledging its outstanding universal values and global significance. World Heritage places and properties have been inscribed on the World Heritage List to be protected for future generations to appreciate and enjoy (UNESCO 2021a).

Blue Mountains National Park and Kanangra-Boyd National Park planning considerations

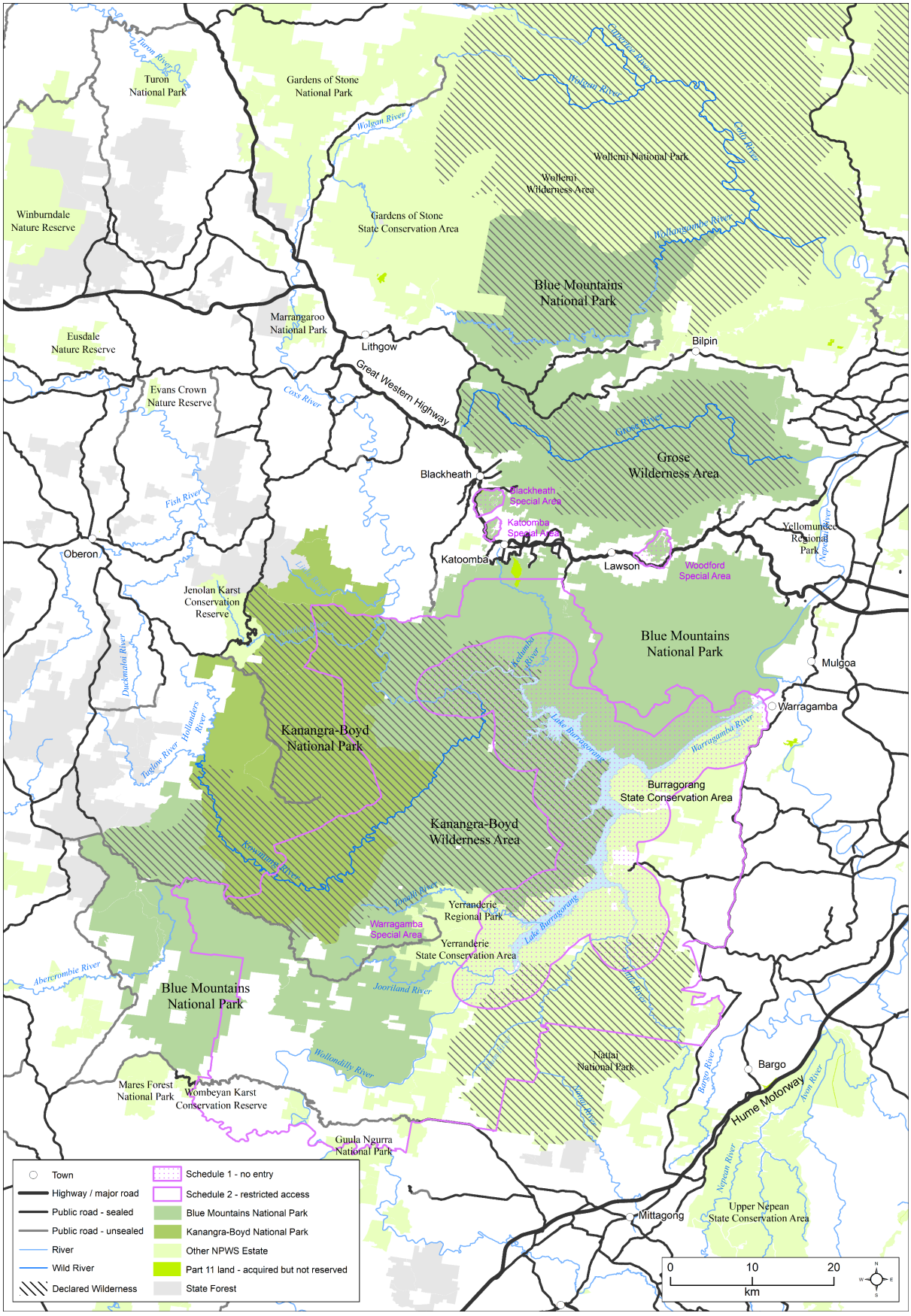

Figure 2 Legislative framework

Blue Mountains National Park and Kanangra-Boyd National Park planning considerations

Almost all of Blue Mountains and Kanangra-Boyd national parks are within the Greater Blue Mountains Area World Heritage property, and together these parks form about 30% of the property. Other parks in the property are Yengo, Wollemi, Gardens of Stone, Nattai and Thirlmere Lakes national parks; and Jenolan Karst Conservation Reserve. Aboriginal people from 6 language groups (Darug, Gundungurra, Wiradjuri, Dharawal, Darkinjung and Wanaruah) continue to have a custodial relationship with the area that makes up the Greater Blue Mountains Area.

A statement of Outstanding Universal Value (statement of OUV) is the official statement adopted by the World Heritage Committee at the time of inscription of a property on the World Heritage List. The statement of OUV for the Greater Blue Mountains Area (UNESCO 2013) encapsulates how the property satisfies the relevant World Heritage listing criteria, how it meets the conditions of integrity (and authenticity for cultural properties), and it also describes the system of protection and management in place.

The Greater Blue Mountains Area satisfies 2 of the natural criteria for World Heritage listing:

- Criterion (ix) – outstanding examples of ongoing ecological and biological processes significant in the evolution of Australia's highly diverse ecosystems and communities of plants and animals, particularly eucalypt-dominated ecosystems
- Criterion (x) – significant natural habitats for the in situ conservation of biological diversity, including the eucalypt and eucalypt-dominated communities, taxa with Gondwana affinities, and taxa of conservation significance (DECC 2009a).

The parks contain specific examples of the Outstanding Universal Value (OUV) of the Greater Blue Mountains Area including:

- a very high diversity of plant communities, including eucalypt-dominated forests as well as heaths, upland swamps, rainforests, alpine and subalpine communities
- a very high concentration of iconic sclerophyll species, particularly in the family Myrtaceae (especially eucalypts), Fabaceae (including *Acacia*) and Proteaceae
- threatened, rare or endemic taxa
- numerous taxa with Gondwanan affinities, such as the primitive gymnosperm known as the dwarf mountain pine, which is found on cliff edges in Blue Mountains National Park and is regarded as having outstanding significance in terms of the evolution of plant life
- a relict Gondwanan flora surviving in protected moist gullies, juxtaposed with post-Gondwanan sclerophyll flora on the slopes and ridges, which represent examples of important stages in the climatic, geological and biological evolution of Australia
- according to the statement of OUV, the World Heritage biodiversity values are complemented by numerous other values, including Indigenous cultural heritage and historic heritage values, geodiversity, water systems, wilderness, recreation and natural beauty (UNESCO 2013).

In the statement of OUV, integrity relates primarily to size, intactness and site condition. For the Greater Blue Mountains Area, the large areas of wilderness (see Section 1.3.4) are an important element of integrity. Several other elements contribute to the integrity of the property, including:

- size (1.03 million ha) and connectivity with other protected areas
- intactness and site condition
- high wilderness quality and statutory wilderness designation of 65% of the property
- geological structure and geomorphology
- water systems

- Indigenous cultural context and longevity of connections with the land
- the property's natural beauty.

Greater Blue Mountains Area National Heritage listing

The National Heritage List was established in 2003 under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to list places of natural, historic and Indigenous places that are of outstanding National Heritage value to the Australian nation.

In 2007, the Greater Blue Mountains Area, along with several other World Heritage properties in Australia, was added to Australia's National Heritage List through a process of aligning World Heritage criteria with the National Heritage criteria. The National Heritage values of the property are those that correspond with the relevant World Heritage criteria as per the Commonwealth of Australia Gazette Notice (2007).

In 2005, the property was nominated for assessment by the Australian Heritage Council for potential National Heritage cultural, scenic and geoheritage values. These are values are additional to those listed that aligned with the OUV. At the time of publication of this report, the Australian Heritage Council is assessing these additional values and additional areas of the Greater Blue Mountains Area for potential inclusion on the National Heritage List.

Management considerations and opportunities

World Heritage properties must be managed in accordance with Australia's obligations under the *Convention concerning the protection of the world cultural and natural heritage* (commonly referred to as the **World Heritage Convention**) (UNESCO 2022).

The *Operational guidelines for the implementation of the World Heritage Convention* (UNESCO 2021b) establish procedures for the inscription of properties on the World Heritage List, the protection and conservation of World Heritage properties, and the mobilisation of national and international support in favour of the World Heritage Convention.

The Australian Government has an **overarching management framework** to guide best practice management for World Heritage properties. The framework includes:

- the Australian World Heritage intergovernmental agreement, which outlines roles and responsibilities of the Australian, state and territory governments (Commonwealth of Australia 2009)
- the EPBC Act – the key piece of Commonwealth legislation to protect the OUV of World Heritage properties
- the Australian World Heritage Advisory Committee, which includes representatives from each Australian World Heritage property who share information on best practice management
- the Australian World Heritage Indigenous Network, which provides an Indigenous perspective on managing Australia's World Heritage properties.

World Heritage properties must be managed in accordance the World Heritage provisions of the EPBC Act, including the management principles in the EPBC Regulations 2000 which identify the primary purpose for management being to identify, protect, conserve, present, transmit to future generations and, if appropriate, rehabilitate the World Heritage values of the property. Management arrangements must also ensure that the **integrity** (and authenticity for cultural heritage properties) of World Heritage properties at the time of their inscription is maintained.

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In accordance with the EPBC Act, any action that has, will have or is likely to have a significant impact on the OUV of a World Heritage property must be referred to the responsible Minister for consideration.

An overarching **strategic management plan**, the *Greater Blue Mountains World Heritage Area strategic plan* (DECC 2009a; revision in prep. 2023), provides a framework for meeting Australia's international responsibilities under the World Heritage Convention. The strategic plan has been developed in accordance with the EPBC Regulations, which requires management plans for World Heritage properties to include strategies for the identification, protection, conservation, presentation and transmission of World Heritage values and include measures for evaluating and monitoring the condition and trend of World/National Heritage values and management effectiveness, and strategies for rehabilitation where appropriate.

NPWS manages the Greater Blue Mountains Area in accordance with the strategic plan, relevant legislation and the statutory management plans for each of the component reserves. The objectives and management operations in the plan of management for the parks are consistent with the management, outcomes, objectives and strategies identified in the strategic plan.

The strategic plan identifies the **key threats to World Heritage values**, which include:

- climate change
- fire and fire regimes
- feral animals, weeds and pathogens
- visitor impacts
- activities outside the boundaries.

The *International Union for Conservation of Nature World Heritage outlook 3* (IUCN 2020) report advises the conservation outlook assessment for the Greater Blue Mountains Area World Heritage property has **deteriorated** since 2017 from 'good with some concerns' to 'significant concern' in the 2020 assessment cycle.

There have been long-held concerns about the potential impact on the OUV of the World Heritage property from mining projects in the vicinity of the Greater Blue Mountains Area. As a result, a cumulative impact assessment was undertaken with the result being that the overall risk to the OUV of the Greater Blue Mountains Area was assessed as 'low', largely because most of the potential impacts are currently effectively mitigated by strict environmental conditions imposed on the mine operators (DAWE 2022).

At least 432 native animal species have been reliably recorded in the 8 reserves of the Greater Blue Mountains Area since the time of European settlement, including 254 bird, 74 reptile, 68 mammal and 36 frog species. More than **one-sixth of these species are currently considered threatened** at a national and/or state level (Smith et al. 2019).

The **devastating fires** in the Greater Blue Mountains in 2019–20 have raised new challenges for the World Heritage property. Many species that are attributes of the OUV of the property were impacted by the fires. Prior to the fires of 2019–20, many of the natural plant communities and habitats of the site remained close to pristine, and recovery from the impacts of the fires is being closely monitored. Further planning and adaptive management are important to address threats, especially climate change and its unfolding effects, including drought and uncontrollable fire (IUCN 2020). As there has been a resurgence of undergrowth in the wake of the fires, maintenance of appropriate fire regimes, including fire suppression and the implementation of prescribed and traditional burning practices, is important to avoid further unmanageable hot fires. Recovery from the 2019–20 fires will need to continue, focusing on building ecosystem resilience in the face of continued drought and catastrophic fire conditions (see also Section 3.5).

Impacts on World/National Heritage values can result from community and park visitor **lack of understanding about the values** of the property. Together with increasing visitation and inappropriate recreational use, this can also exacerbate the threat of animal, plant and pathogen species (see Section 3.4). There are opportunities to improve the information available to visitors, neighbours and nearby communities on ways they can minimise impacts and help protect the Greater Blue Mountains Area's OUV.

In addition to the World Heritage-listed values of the Greater Blue Mountains Area, the area has numerous **other important values** which complement its World Heritage values, including geodiversity, scenic and Indigenous and historic values. These are being assessed and may qualify for inclusion on the National Heritage List, and may have the potential to be nominated for World Heritage listing following further research and documentation. Protection of these values is an integral component of managing the Greater Blue Mountains Area.

International recognition of the Aboriginal cultural values and connection to Country of Aboriginal people would acknowledge the ancient and current custodial relationships that Aboriginal people have with the Greater Blue Mountains Area. Aboriginal cultural heritage management in the 2 parks will be enhanced through the research and documentation phase of the renomination process, acknowledging the area's rich cultural history.

Several additions to the parks have occurred since the original World Heritage listing. Additions to the parks should be managed as part of the Greater Blue Mountains Area while the process to pursue inclusion in the World Heritage property and National Heritage List continues.

1.3.3 Regulated catchments and special areas

Blue Mountains and Kanangra-Boyd national parks include large parts of the Sydney Drinking Water Catchment and Hawkesbury-Nepean Catchment. These catchments are 'regulated catchments' under the *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP).

'Special areas', established under the Water NSW Act, are lands that surround and protect drinking water supply storages. They are established to protect the quality of stored waters and maintain the ecological integrity of the surrounding lands. Public access to special areas is restricted to help protect water quality.

Approximately 141,700 ha of Blue Mountains and Kanangra-Boyd national parks are declared special areas, protecting water supplies for Sydney and the Blue Mountains. They are the Warragamba Special Area, established in 1942; and the Blackheath, Katoomba and Woodford special areas, all established in 1991 (Figure 2).

The special areas are subject to the Water NSW Act, Water NSW Regulation 2020 and Chapter 6 of the Biodiversity and Conservation SEPP.

Management considerations and opportunities

In regulated catchments construction and maintenance of infrastructure, such as management trails, and other management activities are subject to additional assessment and environmental considerations. These relate to water quality and quantity, aquatic ecology, flooding and (outside the Sydney Drinking Water Catchment) recreation and public access.

To protect water quality in the Sydney Drinking Water Catchment, a key consideration is whether the activity will have a neutral or beneficial effect (NorBE) on water quality consistent with the WaterNSW NorBE guideline (WaterNSW 2022). These planning

provisions help ensure important water quality, ecological and catchment values are considered and protected in management and approval decisions for new infrastructure works.

In accordance with the Water NSW Act, **WaterNSW and the NPWS jointly manage** the special areas guided by the *Special areas strategic plan of management* (WaterNSW and OEH 2015). The strategic plan sets out principles and objectives for management of special areas that consider the complementary purposes of protecting water quality and conserving natural and cultural heritage values. The plan outlines the responsibilities of NPWS and WaterNSW and provides structures and mechanisms for liaison, coordination and decision-making between the agencies.

WaterNSW has primary responsibility for managing public access to the special areas and NPWS assists WaterNSW to implement its regulatory responsibilities. The Water NSW Regulation 2020 prohibits certain conduct and activities in special areas to protect the quality and quantity of the water supply. WaterNSW can give its consent to carry out these activities in specific circumstances.

To minimise risks to the values of special areas, the lands have been classified into water quality schedules and **public access is regulated** in accordance with these schedules (see Figure 2):

- **Schedule 1: No entry** – the lands immediately surrounding the water storages (includes around 35,000 ha of Blue Mountains National Park). Public entry is generally not permitted, however, WaterNSW has provided consent for public vehicle access to McMahons Lookout, foot access via the Mount Mouin–Mount Cookem corridor in the Warragamba Special Area, and some areas of Woodford Special Area are open for recreational use.
- **Schedule 2: Restricted access** – a second tier buffer zone that generally adjoins Schedule 1 lands (includes over 80,000 ha of Blue Mountains National Park and over 26,400 ha of Kanangra-Boyd National Park). While some public entry and activities are permitted, restrictions apply, including restrictions on cycling, horses and vehicle access except on public roads.

A range of infrastructure, including management trails, are maintained within the special areas. **Construction and maintenance activities** must meet environmental planning and assessment requirements. In addition, the Biodiversity and Conservation SEPP requires that a public authority must, before it carries out or consents to any activity in the Sydney Drinking Water Catchment (including the special areas), consider whether the activity would have a neutral or beneficial effect on water quality.

1.3.4 Wilderness areas

The *Wilderness Act 1987* provides the legislative basis for identifying, protecting and managing wilderness in New South Wales.

NPWS policy states that the objectives for protecting and managing wilderness are to:

- identify and subsequently manage large areas that approach a wilderness condition, or which can be restored to that condition
- conserve natural features and processes, with a minimum of human interference
- conserve Aboriginal and historic resources in wilderness areas, in accordance with the NPW Act, the *Heritage Act 1977* and the Burra Charter
- maintain opportunities for solitude and compatible self-reliant recreation and exclude activities that conflict with or diminish these opportunities
- encourage public awareness and appropriate use of wilderness.

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The IUCN's World Commission on Protected Areas acknowledges that the term 'wilderness' is used in a variety of ways in addition to the context of protected area classification and management. It can be a biological descriptor, a way to describe the relationship of humans to 'wild nature', and also used colloquially depending on the viewer's personal experience and perspective (IUCN 2016). Indeed, some people do not accept the term 'wilderness' and there is no universally equivalent term across cultures. While acknowledging all of these meanings, the management of wilderness areas in the parks has to align with NSW legislation and policy.

Wilderness legislation regulates human use of certain areas to preserve certain wilderness values, while allowing uses or activities that are consistent with those values (rather than aiming to exclude people per se) (IUCN 2016). It is important that Aboriginal people are involved in resolving wilderness management issues. The Gundungurra Indigenous Land Use Agreement (ILUA) applies in the Kanangra-Boyd Wilderness.

Three wilderness areas make up around 48% of Blue Mountains National Park and 80% of Kanangra-Boyd National Park (see Figure 2):

- **Wollemi Wilderness** – covers 25,844 ha of the northern part of Blue Mountains National Park and extends into Wollemi National Park
- **Grose Wilderness** – covers 47,900 ha of the upper Grose Valley of the Blue Mountains National Park and is one of the most accessible wilderness areas in New South Wales
- **Kanangra-Boyd Wilderness** – covers 125,000 ha of Blue Mountains National Park and Kanangra-Boyd National Park and is one of the largest and most rugged wilderness areas in New South Wales.

The Grose and Kanangra-Boyd wilderness areas, in particular, are among the most accessible wilderness areas in New South Wales, just hours from Sydney and Australia's principal international airport. The majority of recreation in the parks is concentrated around the (non-wilderness) edges, which creates a juxtaposition of remote 'wild country' experiences relatively close to areas of extreme high visitor use. These 2 wilderness areas hold historic and social significance in terms of the conservation movement in New South Wales and the establishment of the Greater Blue Mountains Area World Heritage property.

The Kanangra-Boyd Wilderness was declared in February 1997, with additions made in 2002. The area comprises the rugged gullies and ridges of Kanangra Creek and the Kowmung and Jenolan rivers. This wilderness area covers most of Kanangra-Boyd National Park, but also extends into Blue Mountains National Park. An additional area of roughly 80 ha, located south of Iron Pot Ridge Trail in Blue Mountains National Park, was added to the Kanangra-Boyd Wilderness on 19 November 2010.

Following assessment in 1998 (NPWS 1998) the Grose Wilderness was declared in July 2001 and lies wholly within Blue Mountains National Park, covering most of the Grose River and its tributaries. This wilderness area protects an extensive network of gorges and canyons and includes parts of the historically significant Blue Gum Forest (see Section 4). The river and catchment have high significance for Aboriginal people and a large number of Aboriginal sites have been recorded in the Grose River catchment, including open camps, rock engravings, shelters and axe-grinding grooves (DECC 2008a).

Part of the Wollemi Wilderness also lies within Blue Mountains National Park. The Wollemi Wilderness is the largest wilderness area in New South Wales and the largest in eastern Australia between Cape York Peninsula and Tasmania. This wilderness protects the Colo River catchment, which includes the Wollangambe River.

Within the 3 declared wilderness areas in these parks, formed trails are limited, but basic walking tracks (Class 5) and 3 regularly used camping areas exist, and bush camping (i.e. outside of designated camping areas) is generally permitted. Facilities, signposting and other

management devices are generally avoided unless deemed essential for public safety, management operations or environmental protection. Management of natural and cultural heritage, introduced species and fire is carried out in wilderness areas in the same manner as in other parts of NPWS parks, with special attention to minimising impacts on wilderness values. By and large, protection of natural values has priority over providing for recreational use in wilderness areas.

Following a wilderness proposal around 1999, NPWS undertook a preliminary assessment of an area of land known as 'Murruin', in the south-western part of Blue Mountains National Park (29,590 ha in total, including 25,000 ha in the park) (DEC 2004a). The area is centred on the Mount Werong Plateau on the Great Dividing Range and extends over a high diversity of forest environments – mountain gum and snow gum to yellow box, white box and brown barrel forests. Important native fauna recoded in the area include threatened glider and owl species and the large-eared pied bat. The assessment resulted in over 28,000 ha of wilderness being identified, but the area has not been declared wilderness.

2. Caring for Country

The Blue Mountains and Kanangra-Boyd national parks are mostly in Dharug and Gundungurra Country (see Box 3). The Greater Blue Mountains Area World Heritage property covers 8 parks, including Blue Mountains and Kanangra-Boyd, that are in the Country of the Dharug, Gundungurra, Wiradjuri, Dharawal, Wanaruah and Darkinjung Aboriginal peoples. The land, water, animals, plants and landscapes in the parks have traditional and contemporary significance for local Aboriginal communities. Distinct culture, language and practice are recognised between the Aboriginal language groups and there is also overlap geographically and through family relationships.

Aboriginal communities have an association with and connection to the land. Aboriginal communities associate natural resources with the use and enjoyment of foods and medicines, caring for the land, passing on cultural knowledge, kinship systems and strengthening social bonds.

Landscapes are formed by natural systems and shaped by history and culture. The landscape of the Blue Mountains and Kanangra-Boyd area is the product of long-term and complex interrelationships between people and the environment (DECC 2008b). Aboriginal heritage and connection to nature are inseparable from each other and need to be managed in an integrated manner across the landscape.

We acknowledge these parks as a cultural landscape where we aim to protect natural and cultural values, sustain traditional connections to the land and engage local people and park visitors in stewardship of these places.

Box 3: What is 'Country'?

To Aboriginal people, the landscape is made up of many features that are interrelated. These include land, water, plants and animals, places and stories, historical and current uses, and people and their interactions with each other and place. These features are central to Aboriginal spirituality and contribute to Aboriginal identity. They are inseparable and make up what is known as 'Country'.

'As Aboriginal people our identity is inseparable from our Country. We are the people of that Country. It holds our stories, provides food and medicine to our bodies and spirit and it has been home to our people for all recorded history, as it has been home to our ancestors for tens of thousands of years.'

(Dharug man, 2011)

Aboriginal sites are places with evidence of Aboriginal occupation or places that are related to other aspects of Aboriginal culture. They are important as evidence of Aboriginal history and as part of the culture of local Aboriginal people.

The parks allow for continued connections to Country (see Box 4), helping to maintain a tangible link between the past and present, enabling cultural practice and contributing to the cultural identity of local Aboriginal people.

Aboriginal people have occupied Australia for more than 40,000 years. In Blue Mountains National Park, excavations at Kings Tableland provide evidence of human occupation from at least 22,000 years ago (Stockton 2009a) and stone tools from Lyrebird Dell in the upper Blue Mountains have been dated at 12,000 years old (Kohen 2006). In the lower mountains, an open campsite on Jamison Creek that remained in use up to the 1840s is thought to have been first occupied at least 8,000 years ago (Kohen 2006).

Box 4: Connection to Country

Aboriginal people have consistently described their relationship to land and natural resources as one of 'belonging to Country'. In the Aboriginal world view, people and Country are an integral whole and the entire landscape has spiritual significance. This means that there is no separation between nature and culture, and the health of the natural environment and Aboriginal people are intimately connected. The wellbeing of Aboriginal people is influenced by both the health of the environment and the degree to which they can be actively involved in caring for it (adapted from DECC 2008c).

Aboriginal people sustained a deep cultural connection to the Blue Mountains for millennia. After the arrival of Europeans in 1813 and the rapid displacement and disruption to cultural practices, Aboriginal people had little choice but to adapt to the massive changes that were forced upon them. Despite these impacts, Aboriginal people continue to maintain their culture and connections to the Greater Blue Mountains.

Physical evidence of Aboriginal occupation exists throughout the parks in at least 500 recorded sites, including grinding grooves, stone arrangements, spiritual sites, rock engravings, other rock art, shelters with occupation deposits, other occupation sites, artefact scatters and modified trees (NPWS 2022a). Archaeological surveys have been conducted in some areas but not all, and it is likely that the number of sites in the parks is significantly higher. Despite the incomplete nature of the surveys, the parks are known to contain a large number of significant sites and objects which reflect the relationship that Aboriginal people have to Country, including rock art sites that relate to well-known Aboriginal stories and provide a tangible basis for the link between Aboriginal people and Country today.

Aboriginal cultural context and longevity of connections with the land, including continued Aboriginal custodial relationships, Aboriginal rock art and occupation sites, is part of the integrity of the Greater Blue Mountains Area World Heritage property.

The parks contain 4 Aboriginal places (see Box 5), declared under the NPW Act, which are culturally sensitive sites of special significance to Aboriginal people. The places are: Kings Tableland, Three Sisters, Red Hands Cave and Euroka 'Nye Gnoring'.

Box 5: What is an 'Aboriginal place'?

The declaration of an Aboriginal place under the NPW Act provides a formal means for the NSW Government to recognise and provide legal protection to areas of land with special significance to Aboriginal people and culture. It also helps provide protection to ensure that the significance of the place is not harmed or desecrated.

Kings Tableland (near Wentworth Falls) was an important transit route for Aboriginal people from the plains and valleys to the plateau, and well over 500 sites have been reported from that area, including rock art sites, axe-grinding grooves and hand stencils (Jackson 2007). In recognition of the area's special Aboriginal cultural significance, the tessellated rock platform with numerous axe-grinding grooves was declared an Aboriginal place under the NPW Act in November 2011. For the Gundungurra People the area evokes strong feelings of connection to Country and responsibility for Country (Jackson 2007).

In January 2014, the Three Sisters (at Katoomba) became the second declared Aboriginal place in Blue Mountains National Park. The Three Sisters, along with the view of the Kedumba Valley below, has a special association with the Gundungurra and Dharug peoples as place of ancestors, legends and stories.

The Dharug People have an ancient and continuing connection with Euroka 'Nye Gnoring', meaning spiritual place, which is reflected in their historic and ongoing association with the place. Near Glenbrook, it is a place where Dharug People come to connect back to their people and their land, allowing them to protect and manage their cultural heritage, including their traditional practices. Nye Gnoring was declared an Aboriginal place in September 2015.

The Dharug and Gundungurra peoples, and other local Aboriginal people, have an ancient and continuing connection with the ceremonial Red Hands Cave site near Glenbrook. It was declared an Aboriginal place for cultural and spiritual reasons in September 2015.

Other, less visible Aboriginal connections to these parks include traditional and continuing knowledge of the landscape and its plants and animals, spiritual connections to the place, and personal and community stories, memories and oral traditions.

Box 6: Aboriginal joint management

The NPWS acknowledges that the Aboriginal peoples of Australia are the original custodians of the lands and waters, animals and plants of New South Wales and its many and varied landscapes.

Under an Aboriginal joint management arrangement, the NSW Government and local Aboriginal people share responsibility for a park's management. This is to ensure that Aboriginal people can participate in planning and decision-making for the park, reserve or area while maintaining access to parks for everyone.

Aboriginal joint management options currently include memoranda of understanding, Indigenous land use agreements (ILUA), lease-back agreements or more informal arrangements with the NPWS. The NSW Government has committed to developing a new Aboriginal joint management model for NSW national parks (NPWS 2023a).

2.1 Management arrangements

Formalised co-management arrangements include the Gundungurra ILUA. The ILUA was registered in 2015 and covers a large area of the Blue Mountains and Kanangra-Boyd national parks (see also Section 1.3.1 and Figure 1).

Blue Mountains and Kanangra-Boyd national parks fall within the administrative areas of Bathurst, Pejar and Tharawal local Aboriginal land council areas; and part of Blue Mountains National Park also falls within the Deerubbin Aboriginal Local Aboriginal Land Council area.

2.1.1 Management considerations and opportunities

Aboriginal people interviewed during the development of this plan generally acknowledge that the parks have provided a level of protection for Country that has been denied elsewhere in the region, and for which many community members expressed appreciation. However, all Aboriginal people interviewed consider there is much more to do to protect Country and the living culture of Aboriginal people in the Greater Blue Mountains and seek NPWS assistance to achieve this.

Priority issues in management of the parks include site protection and conservation of cultural values, caring for and access to Country, support for cultural activities and opportunities for employment and training. Aboriginal people want to continue to be consulted with and involved in issues relating to management of the parks.

Blue Mountains National Park and Kanangra-Boyd National Park planning considerations

Although the NSW Government has legal responsibility for the protection of Aboriginal sites, NPWS acknowledges the **right of Aboriginal people to make decisions about their own heritage**. Aboriginal people's spiritual and cultural connection to the parks is respected and there is recognition of the importance of incorporating local Aboriginal knowledge into the ongoing management of the parks. Aboriginal communities need to be consulted and involved in the management of Aboriginal sites and related issues. NPWS is continuing to work with the Aboriginal community to develop mechanisms for ongoing involvement in park management decision-making.

NPWS is committed to recognising the role of Aboriginal people as custodians and managers of their Country and culture. NPWS works with Aboriginal people to ensure their rights to practice and maintain their culture, to protect and conserve their heritage, and to own and control their intellectual property and cultural knowledge are respected and realised. NPWS is also committed to working with Aboriginal communities to acknowledge the historical dispossession from Country and to partner with Aboriginal communities to support opportunities for self-healing and empowerment.

Knowledge and protection of the cultural features of the parks is important to Aboriginal communities today for many reasons, including that many such features represent a source of spiritual strength, inspiration and learning. For example, in Blue Mountains National Park, along Mount Hay Ridge, Linden Ridge and Asgard (a plateau in the upper Grose Valley), an ochre quarry, work floor and rock engravings (Stockton 2009b) confirm ceremonial gatherings occurred in the parks.

Cultural sites in the parks need to be managed. This includes recording and documenting sites before they are lost or damaged, identifying threats and protecting sites from damage. Particular **threats to sites** include erosion, informal tracks, arson, graffiti, deliberate destruction, ignorance, removal, and impacts associated with fire, feral animals and weeds. Some rock shelters containing art sites are sensitive to rock collapse due to the natural processes of exfoliation and weathering. **Regular monitoring** is needed to assess the condition of known Aboriginal cultural heritage in the park. The devastating **bushfires** of 2019–20 had impacts on some cultural sites. Post-fire cultural heritage assessments continue to be undertaken and site protection works are considered prior to hazard reduction burns.

The development of **management plans for the Aboriginal places** in the parks, prepared in accordance with the *Guidelines for developing management plans* (OEH 2017) and in consultation with appropriate Aboriginal communities, provides a mechanism for ensuring ongoing protection of these places.

While there have been many archaeological surveys, it is expected that many more sites exist in the parks and there are **opportunities to better understand the Aboriginal history** and significance of the parks. Research should be encouraged where it contributes to understanding and protection of cultural values, provides opportunities for employment or training for Aboriginal community members and is conducted in partnership with Aboriginal communities.

There is potential to **enhance the identity of the parks as an Aboriginal cultural landscape**, including activating cultural tourism and incorporating Aboriginal language in the naming of places, signage and interpretation where possible. There are opportunities for Aboriginal communities to promote, interpret and share culture in the parks. There are opportunities for tourism-based Aboriginal cultural programs, including community partnerships and commercial tour operators, that interpret Aboriginal cultural values in ways that are culturally sensitive, appropriate, and provide socioeconomic benefits to Aboriginal people.

Aboriginal people have increasingly sought to **represent their histories themselves**; to put into their own language the stories, values and significance of Country and the effects of dispossession and colonisation. This helps Aboriginal people gain greater autonomy over their lives, to take control of their future and to recognise and act on their distinctive rights.

Access to Country is extremely important for Aboriginal people. Aboriginal cultural knowledge is kept alive and is passed on through language, song, dance, art, story, through being on Country, hunting and harvesting, and through many other cultural practices. Opportunities to continue these practices are essential to the survival of Aboriginal culture (Woodward et al. 2020). The parks provide opportunities for the local Aboriginal community to access Country to **maintain, renew or develop cultural connections and practices**. Opportunities include group activities or culture camps on Country and the non-commercial cultural use of resources such as medicinal plants, bush tucker and fish.

The boxes below, and in the next section, include quotes from local Aboriginal people that express the relationships Aboriginal people have with Country and the issues identified, and aspirations held, by some Aboriginal people for the parks.

Cultural practice and access to Country

'… Site access. Which is now difficult because of changes to land management. Aboriginal people need access to sites to manage them (e.g. cleaning shelters and cleaning out wells) …'

(View expressed by an Aboriginal person at a Blue Mountains NPWS Living Country Culture Camp, 2009)

'… I tell the kids too, we need to know about our culture, and what it really means. And the way we lived back then for thousands of years … we cared for the land, because the land cared for us. We don't own the land. The land owns us.'

(Dharug elder, 6 June 2011)

Aboriginal groups have reiterated the need for continued **access to Country for cultural practice**, including to some areas that are only accessible from management trails. Aboriginal Elders want to **pass on their culture and knowledge** to younger Aboriginal people and to improve management of cultural values in the parks. Aboriginal people want to enhance **cultural reconnection** through the **use of wild resources** for cultural purposes, including teaching.

Aboriginal culture camps have been held in the parks and provide an opportunity for traditional custodians and other Aboriginal people to connect with each other, Country and culture. NPWS supports and facilitates Aboriginal people to hold **culture camps and other cultural activities on-park** by working with Aboriginal people to identify opportunities, appropriate settings, access arrangements and other procedures. There are opportunities to establish a suitable camping area in the parks (as part of a current designated camping area, such as Dunphys or Euroka) to support Aboriginal people to gather on Country.

Caring for Country

'As an Aboriginal man, I actually feel that … I've got to stay put and look after this Country even when it's not well.'

(Dharug man, June 2011)

'We want to be involved in the management of our Country based on the values our ancestors have passed down to us.'

(Dharug man, May 2011)

The Gundungurra ILUA establishes a partnership with NPWS to care for Country. The Gundungurra People are non-exclusively recognised as being appropriate people to be engaged to provide heritage advice to NSW Government authorities for land covered by the agreement area. The ILUA has established a Gundungurra Consultative Committee that may make recommendations to NPWS on the care, control and management of the parks and reserves in the agreement area (see Section 1.3.1).

There are opportunities for the Aboriginal community to be more involved in park management programs and activities, such as the consideration of traditional burning practices in the development of fire management programs.

Aboriginal people want stronger engagement with NPWS staff so that they can share a greater understanding of Aboriginal cultural heritage and of the values of Country to non-Aboriginal people.

Strategic planning

'… by getting it documented and clear in a plan of management, hopefully then another set of values will not destroy the park. And then you've lost it, you've lost a lot of healing for this Country …'

(Gundungurra man, 30 May 2011)

Aboriginal people want to benefit from **economic opportunities associated with the parks**, either through training, direct employment or through business or partnerships. There are significant opportunities for cultural tourism in the parks.

Consultation

'… in a plan of management, it needs to be spelled out very plainly that Aboriginal people have to be consulted on issues within national parks …'

(Gundungurra woman, 30 May 2011)

3. Protecting the natural environment

Blue Mountains and Kanangra-Boyd national parks extend across both the South Eastern Highlands and the Sydney Basin bioregions (NPWS 2003a). Consistent with the bioregions, the parks experience a temperate climate characterised by warm summers and no distinctive or regular dry season, however, some areas fall within a montane climatic zone and snow can occasionally occur in areas of higher elevation (NPWS 2003a). The dramatic gorge country of the Great Escarpment is the most prominent landscape feature of the bioregions. As the parks span an altitudinal range from less than 20 m on the Nepean River to 1,334 m on the Boyd Plateau, and extend over 2 bioregions, they include a great diversity of environmental conditions and protect a very large number of plant communities and animal species (NPWS 2003a).

The parks form a significant component of the Great Eastern Ranges corridor, a large-scale conservation vision for eastern Australia aiming to maintain and improve the connectivity of mountain ecosystems running the length of eastern Australia (Mackey et al. 2010).

Caring for natural values – an Aboriginal perspective

'Natural resources need to be recognised as cultural resources; there is no separation between the two for Aboriginal people'

(View expressed by an Aboriginal person at a Blue Mountains Living Country Culture Camp, Jenolan Caves, 2009)

'… we need to conserve the associations of plants because you need plants growing, certain species growing together to make the medicine stronger, but we're not taking any notice of that …'

(Dharawal Elder and storyteller, 17 June 2011)

3.1 Geology and landform

The geology and geomorphology of the parks create a highly scenic landscape and provide significant evidence of the complex geological processes that operated in the area as far back as the early Palaeozoic period (400 million years ago). Many of the fundamental processes in land formation are evident, including uplift, erosion, deposition and the effects of igneous and metamorphic activity, making the parks particularly valuable for interpretation and education.

The escarpment is the most prominent landscape feature of the parks and, with many vantage points and lookouts, it is one of the key factors in attracting visitors to the Greater Blue Mountains region. In the parks, the deeply incised sandstone plateau rises from 100 m to 1,300 m elevation, with basaltic outcrops and caps on the higher ridges.

The major rock outcrops in **Blue Mountains National Park** are the sedimentary sandstones laid down over the Permian Coal Measures during the Permian and Triassic periods, up to 250 million years ago. Subsequent uplift, combined with over 90 million years of erosion of sandstones and shales, has created a highly dissected and visually diverse landscape. Differential weathering has been responsible for the benched cliffs, narrow slot canyons, pagoda rock formations and the mountains that rise above the plateau and dominate the scenery of the park.

The park contains many examples of ancient volcanic activity and intrusions, including volcanic necks or diatremes dating from the middle Triassic to early Jurassic, 200 to 160 million years ago (such as Euroka and Murphys Glen), volcanic rocks of the Lachlan Fold Belt (such as Yerranderie Peak) and mountains capped with a thin layer of volcanic basalt (such as Mount Hay, Mount Banks and Mount Colong).

Some locations in the parks are considered to have geological values of national or international significance (Washington and Wray 2015), including the Jamison Valley (Percival 1979) and the Yerranderie area (Schon 1984). Several palaeontological (fossil) sites have been recorded in the park, some of which contain elements of the Gondwanan flora dating back approximately 285 to 225 million years (Percival in James ed. 1994).

Kanangra-Boyd National Park encompasses the Boyd Plateau and the surrounding deeply incised valley system comprising the Hollanders, Jenolan, Kowmung and Coxs rivers (DEC 2004b). The Boyd Plateau covers roughly 10,000 ha and includes fertile soils in the north, derived from rhyolite and gabbro, and less fertile, well-drained soils in the south, where the plateau is underlain by weathered Carboniferous granite. Elevation ranges from just over 150 m above sea level in the Coxs River valley to 1,334 m at Mount Emperor. The diverse geology and topography reflect the significant geological boundary the park straddles between the Lachlan Fold Belt and the Sydney Basin (DECC 2009a). Important rock types in the park include the folded and partially metamorphosed Silurian and Devonian sandstones, limestones, shales and siltstones. Older rocks from the Devonian period (primarily quartzite, sandstone, siltstone and claystone) are found in the valleys, while the deeper gullies contain older rocks again, dating from the Ordovician period (DEC 2004b). Active erosion of the Great Escarpment has resulted in impressive cliffs and waterfalls in the park, including Kanangra Walls, which form the dramatic boundary between the Boyd Plateau and the Kanangra gorges below. Residual peaks of sandstone and quartzite are found at Ti Willa and Mount Cloudmaker. Kanangra Tops is regarded as the most dramatic example of these residual landscapes, sitting above the sandstone cliffs of Kanangra Walls (DEC 2004b).

Important limestone deposits are found in Kanangra-Boyd National Park, giving rise to extensive karst landscapes (see Box 7) containing caves such as Tuglow, Colong, Moonshine Creek, Hollanders River, Church Creek and Billys Creek. These karst systems provide habitat for some uniquely adapted and rare species, and are important sites for science, conservation and recreation (DECCW 2010). The main cave at Colong is considered the third longest cave in eastern Australia (Osborne 2017).

Blue Mountains National Park also contains small karst systems at Little Wombeyan Creek, Murruin Creek and Limeburners Flat.

Box 7: What is karst?

Karst is a distinct landform shaped largely by the dissolving action of water on carbonate rock such as limestone, dolomite and marble. This process typically occurs over thousands or millions of years, resulting in a variety of surface and below-ground features, including gorges, sinkholes, underground streams and caves (DPIE 2021a).

Karst features interact with the environment to produce complex ecosystems supporting highly specialised plants, animals and micro-organisms. These species contribute to NSW biodiversity and, in many cases, are unable to survive elsewhere.

3.1.1 Management considerations and opportunities

The topography of the region has a significant influence on the **land uses that adjoin the park** boundaries. Surrounding development includes urban areas, mines, transport corridors, forestry roads and management trails which are mostly located on the plateau and ridges above the parks. As a result of the ribbon development of townships along the Great Western Highway in the Blue Mountains, the Blue Mountains National Park is particularly affected by a wide range of impacts, from polluted urban run-off to disruption of visual amenity. Scenic landscape values of the parks can be impacted by inappropriate developments occurring adjacent to the parks.

Karst systems in the parks are highly sensitive to changes on the surface (e.g. erosion) and within caves (e.g. transfer of pollutants or direct damage to speleothems, sediments and cave contents by visitors). Visitor access in and around karst environments requires regulation and monitoring in order to minimise impacts such as damage to geological features, cave sediments or disturbance to animals. Knowledge and appreciation of karst values of the parks is limited, as is understanding of the implications of surface activities on karst values.

Erosion and rock falls are natural processes that occur on steep slopes and areas with highly erodible soils in the parks. Erosion of walking tracks, management trails and geological formations is accelerated by the intensity of their use (recreational or other) and by fire and flood/heavy rainfall. Fallen rock and mass soil movement can lead to greater instability and increase safety risk. Erosion must be considered in the design of new and realigned tracks and trails, and in the maintenance of tracks and trails.

There is an increased risk and incidence of landslide and rockfall associated with increased rain. This has been seen in association with the increased duration and intensity of the La Niña cycle between 2020 and 2022. The resulting management issues include visitor and staff/contractor safety, increased erosion, track closures which concentrate park visitors into other areas of the parks, increased requirement for geotechnical assessments, damage to roads and road closures.

Maintenance of tracks and trails may require the use of additional resources such as soil or gravel. The importation of these materials has the **potential to introduce weeds and pathogens** into the parks.

Knowledge and documentation of significant geological and geomorphological sites and features in the parks is limited, thereby increasing the potential for geodiversity values to be damaged or lost due to human activities or natural events.

3.2 Hydrology, catchment and wild rivers

The parks contain a number of large water catchment systems encompassing drainage lines, creeks, rivers and their surrounding lands. These are fundamental to maintaining water quality in the Hawkesbury–Nepean River and Lake Burragorang, which supplies most of Sydney's drinking water. Major catchments protected by the parks include the Wollangambe, Grose, Glenbrook, Erskine and Coxs. The Kanangra, Jenolan and Kowmung rivers form part of the catchment for Lake Burragorang.

A large part of the Warragamba Special Area, which surrounds and protects Lake Burragorang and Warragamba Dam, is within the parks. Blue Mountains National Park also includes large parts of the Blackheath, Katoomba and Woodford special areas (see Section 1.3.3). The water catchments must be protected to help maintain the quality and quantity of water required to supply drinking water to millions of people in New South Wales.

Parts of the Kowmung, Grose and Wollangambe rivers are declared wild rivers (see Box 8) under the NPW Act and are in near-pristine condition. The Kowmung River was declared in 2005 and has very high biological integrity. Most of its length is within Kanangra-Boyd National Park, while its lower reaches are within Blue Mountains National Park. The Grose River was declared in 2009. Most of its catchment is protected by Blue Mountains National Park and the Grose Wilderness, and its lower reaches have high aquatic biodiversity and good biological condition. While the Colo River lies outside the north-eastern boundary of Blue Mountains National Park, one of its subcatchments, drained by the Wollangambe River, is in the Blue Mountains National Park (DECC 2008a,d).

Box 8: What are wild rivers?

Wild rivers are identified and protected under the NPW Act, and are defined as watercourses, or watercourse networks, which exhibit substantially natural flow and contain substantially undisturbed biological, hydrological and geomorphological processes. The NPW Act protects wild rivers by requiring them to be managed in a way that will maintain and restore (if necessary) their wild river values.

3.2.1 Management considerations and opportunities

Activities on neighbouring lands (including current and past mining activities) and **park management actions** in the parks (including management of weeds, feral animals, pathogens, fire and recreational use) have the potential to influence water quality and quantity in the parks and the subsequent flows into Lake Burragorang.

The NPW Act **protects wild rivers** by requiring them to be managed to restore (wherever possible) and maintain the natural biological, hydrological and geomorphological processes associated with the wild rivers and their catchments, including natural flow variability. The identification, conservation and appropriate management of Aboriginal objects and places is also a requirement. Wild rivers must be managed to protect and conserve their ‘wild’ nature and to reduce impacts both within and adjacent to park boundaries through cooperative arrangements with other land managers. Where wild rivers also pass through declared wilderness areas, they must be managed to satisfy both wilderness and wild river principles.

The Kowmung River is affected in places by **weed invasion and siltation**, although willow and blackberry control programs (both on- and off-park) have been undertaken along the river and its major tributaries (including the Hollanders and Tuglow rivers) (DEC 2005a). Weed surveys undertaken by volunteers in 2019 and 2020 revealed extensive and spreading invasion by moth vine, an environmental weed, along the central portion of the river. The presence of pine plantations and cleared land in the upper catchment may affect natural flows in the upper tributaries of the Kowmung River, but the proportion of the catchment that is modified is relatively small, and overall, the river is considered to be sufficiently hydrologically natural to be declared a wild river (DEC 2005a).

There has been increased flooding associated the extended La Niña cycle between 2020 and 2022, and these weather patterns are expected to increase in intensity under the impacts of climate change. Park management considerations include:

- increased risks for recreational river travellers
- increased risk of incidents requiring deployment of search and rescue
- accelerated erosion and damage to tracks and other infrastructure.

Current and past mining activities nearby the parks have potential to impact water quality in the parks. An underground coal mine and other extractive industries are located on the

edge of the Newnes Plateau near the headwaters of the Wollangambe River, which flows east through the Blue Mountains National Park, and ultimately into the Colo River. A coal mine (Canyon Colliery) operated in the headwaters of the Grose River, just south of Bell, until 1997. Although now closed, this mining activity resulted in zinc and nickel pollution of the upper Grose River, with evidence of significant impacts on macroinvertebrates (Wright and Burgin 2009). Drainage shafts remain a potential source of contaminated water and may continue to impact water quality downstream (Wright et al. 2022). In addition, there was some erosion and weed infestation associated with surface activities from the old mine site (DECC 2008c). In contrast, the lower reaches of the Grose River and Govetts Creek have been assessed as having high aquatic biodiversity and as being in good biological condition (DECC 2008a).

3.3 Native plants and animals

The unique combination of climate, topography, slope, elevation, aspect, drainage, geology, soils and fire history has resulted in a high diversity of plant communities and habitats in the parks, including rainforests, swamps, heaths and mallees, and extensive areas of eucalypt-dominated forests and woodlands. Blue Mountains National Park is particularly diverse, with over 230 plant communities mapped. In Kanangra-Boyd National Park, 94 plant communities have been mapped (see Box 9). Both the *Eucalyptus* and *Acacia* genera are significantly represented in these plant communities. Over 1,000 native plant species have been recorded in the parks.

The high diversity of plant communities and habitats in the parks gives rise to a similar diversity of native animals. Collectively the parks support over 265 species of native birds, 67 reptile species, 36 frog species, 31 mammal species and 22 bat species. Of these, at least 52 are listed as threatened under the *Biodiversity Conservation Act 2016* (BC Act). There are also native fish and a variety of invertebrates protected by the parks. The karst systems in Kanangra-Boyd National Park make a particular contribution to the animal diversity of the park, specifically with respect to bats and cave invertebrates.

Box 9: Vegetation classification (adapted from Keith 2004)

Vegetation formations are the uppermost level of the hierarchy of vegetation classification in New South Wales. They are broad groups distinguished by structure and growth form of the dominant plants. There are 12 vegetation formations currently recognised in New South Wales and 7 of these – dry sclerophyll forests, wet sclerophyll forests, rainforests, heathlands, freshwater wetlands, forested wetlands and grassy woodlands – occur in the Blue Mountains and Kanangra-Boyd national parks (see Appendix B).

Vegetation classes are groupings of related plant communities, defined mainly by shared plant species, although many may share structural and habitat characteristics.

Plant communities are the most detailed and homogenous units in the vegetation hierarchy. They are locally consistent groupings of plants species that live together, generally at the same time. Over 230 plant communities have been mapped in Blue Mountains National Park and over 94 communities in Kanangra-Boyd National Park.

Native plants and vegetation communities

The **south-west sections of Blue Mountains National Park** contain a number of distinct structural vegetation types corresponding to subalpine, montane and eastern tablelands environments that are characterised by moderate rainfall and low to moderate fertility soils (DEC 2004c). This part of the park supports tall montane forests (e.g. around Mount Werong and Banshea Road), woodlands, cool temperate gullies and ridges, deeply incised gorges (e.g. around Murruin, Little Wombeyan and Jocks creeks), alluvial flats and heath woodlands tend to be floristically simple, dominated by species such as red stringybark, brittle gum and

tablelands scribbly gum, with a relatively sparse understorey and ground cover (DEC 2004c). Protected sites in this part of the park often support tall montane gully forests, while dry shrub forest dominated by silvertop ash can be found on the ridgelines and exposed slopes south of Mount Werong (DEC 2004c). A mallee-heath community, supporting a thick shrub layer of silver banksia, occurs on the Loombah Plateau (DEC 2004c), while bog and swamp communities can be found in drainage lines and soaks of the montane and tableland landscapes in the south-west section of the park.

In the **north-east section of Blue Mountains National Park**, the vegetation is dominated by dry sclerophyll forests and woodlands. On ridgetops and exposed slopes of Hawkesbury sandstone, red bloodwood, silvertop ash and scribbly gum often dominate the canopy, although where soil depth decreases and soil moisture increases, woodlands grade into heath, or even upland swamps at locations where drainage is impeded (DECC 2008e). Taller sandstone gully forests occur on the more sheltered slopes and drainage lines, dominated by species such as smooth-barked apple and Sydney peppermint (DECC 2008e). Forests of turpentine and smooth-barked apple are often found in more sheltered slopes and gullies where deeper soils and moister conditions are found (DECC 2008e). Warm temperate rainforest can be found in the moist sheltered gullies of the north-east sections of the park, while riparian (riverbank) scrubs occur along the banks of the Grose River. An unusual community, dominated by tea trees (prickly tea tree and *Leptospermum obovatum*), occurs on the waterlogged soils of Burralow Swamp (DECC 2008e). Where the infertile sandy soils along the eastern boundary of Blue Mountains National Park meet the more fertile soils of the Cumberland Plain, transitional woodlands can be found, including the Sydney Hinterland Transition Woodland and the Sydney Turpentine-Ironbark Forest communities.

The **north-west section of Blue Mountains National Park** supports dry sclerophyll forests and woodlands, talus slope woodland, montane heaths, upland swamps and a unique suite of high-elevation plant species (around Galah Mountain) (DECC 2009b).

In **Kanangra-Boyd National Park**, vegetation on the higher plateaus and sheltered slopes is predominantly moist montane forests. At lower altitudes, on soils derived from the Devonian siltstone and shales, dry sclerophyll forests tend to dominate (DEC 2004b). Vegetation on the Boyd Plateau is more typical of the South Eastern Highlands bioregion, comprising woodlands dominated by tussock grasslands or tall forests with a dominant fern understorey (DEC 2004b). Sclerophyllous shrubby woodlands occur in the western parts of the park, often dominated by silvertop ash, narrow-leaved peppermint and Blaxland's stringybark. Taller forests of brown barrel and narrow-leaved peppermint are often found in gullies with a ferny, relatively open understorey, although a mesic shrub layer often develops in the protected slopes of the deepest gullies (DEC 2004b). Where the Boyd Plateau supports richer, basalt soils, tall open grassy forest can be found, often dominated by brown barrel and mountain gum with a tussock understorey (DEC 2004b). In frost hollows on poorer soils of the Boyd Plateau, a tussock understorey can dominate (DEC 2004b).

Kanangra-Boyd National Park protects regionally important examples of moist montane and snow gum forests, which have been largely cleared from the NSW Central Tablelands (DEC 2004b).

In the eastern and south-eastern parts of Kanangra-Boyd National Park the landscape and plant communities reflect the adjoining Sydney Basin bioregion. On the exposed slopes, woodlands and forests are dominated by narrow-leaved ironbark, forest red gum and grey gum, often with a dry understorey of scattered shrubs and grass (DEC 2004b). Taller forests occur in the more sheltered sites, although very few rainforest species survive here due to the relatively dry conditions. Where rainforests do occur in Kanangra-Boyd National Park, they exhibit obvious cool temperate influences, supporting species such as rough possumwood, austral mulberry and sassafras (DEC 2004b).

Areas of Kanangra-Boyd National Park with impoverished, sandy soils and high exposure generally support heath, mallee and scrub communities. Montane swamps and bogs are a feature of the Boyd Plateau and surrounds and, as in Blue Mountains National Park, occur in areas that are periodically waterlogged due to impeded drainage. Several unique plant communities occur in Kanangra-Boyd National Park, often resulting from local geology, soils or microclimate. These include the Boyd River bogs, the montane heath areas on top of Kanangra Walls and the Kowmung Dry Rainforest and Kowmung Wilderness Complex (NPWS 2004a).

The **vegetation of the Warragamba Special Area**, which spans both the Blue Mountains and Kanangra-Boyd national parks, has been surveyed in some detail (NPWS 2003b). Grey gum is the dominant eucalypt species in the area, occurring on every soil type except basalt and limestone. Grey Myrtle Dry Rainforest is found along major tributaries (e.g. Nattai, Wollondilly, Coxs, Kedumba, Little and Kowmung rivers), and is the most widespread rainforest community in the Warragamba Special Area (NPWS 2003b). Peat bogs are found at higher elevations on more fertile, clay soils, usually in shallow depressions. Hanging swamp communities are found at sites that are periodically inundated, often at cliff edges, on sandstone benches or at the heads of minor gullies (e.g. on Kings Tableland) (NPWS 2003b). As in other parts of the parks, sites with infertile skeletal soil and exposed rock invariably support heath and mallee communities, while dry forests are usually found where there are deeper soils and less frequent rock outcropping. Many swamp communities are found in the Warragamba Special Area, with a variety of structural forms, including wet heaths, sedgelands, bogs and open woodlands (NPWS 2003b).

Threatened ecological communities

Box 10: What is an ecological community?

An ecological community is a naturally occurring collection of native plants, animals and other organisms occupying a particular area. Ecological communities are threatened when they become at risk of extinction. Currently more than 100 threatened ecological communities are recognised in New South Wales by their listing under the BC Act.

The parks protect 11 threatened ecological communities listed under the BC Act and EPBC Act (Table 1).

Table 1 Threatened ecological communities in the parks

Threatened ecological community (short name)	Occurrence	BC Act status	EPBC Act status
Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion	Small patches in the north-east of in Blue Mountains National Park, but poorly represented	E	CE
Blue Mountains Swamps in the Sydney Basin Bioregion	About two-thirds of the current extent of this community is found in the north-west section of Blue Mountains National Park	V	E
Montane Peatlands and Swamps of the Sydney Basin	Scattered distribution, mainly in Kanangra-Boyd National Park and southern Blue Mountains National Park	E	E
Newnes Plateau Shrub Swamp in the Sydney Basin Bioregion	Small areas in Blue Mountains National Park	E	E
River-flat Eucalypt Forest on Coastal Floodplains of the Sydney Basin	Small areas at low elevation along major rivers in Blue Mountains National Park	E	CE
Shale-Sandstone Transition Forest in the Sydney Basin Bioregion	Small areas in the lower mountains area of Blue Mountains NP where shale soils intergrade with sandstone soils, or shale caps overlay sandstone	CE	CE
Sydney Turpentine-Ironbark Forest	Along ridgetops in Blue Mountains National Park, west of Bowen Mountain	CE	NA
White Box – Yellow Box – Blakely's Red Gum Woodland	Kanangra-Boyd National Park and southern Blue Mountains National Park	CE	NA
Blue Mountains Basalt Forest in the Sydney Basin Bioregion	Blue Mountains National Park on basalt caps overlying sandstone	E	NA
Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	Mainly in the south west of Blue Mountains National Park	E	NA
Western Sydney Dry Rainforest in the Sydney Basin Bioregion	Central and southern Blue Mountains National Park and into Kanangra-Boyd National Park	E	NA

Notes: NP = national park; BC Act = *Biodiversity Conservation Act 2016*; EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; E = endangered; CE = critically endangered; V = vulnerable; NA = not listed.

Source: DPE 2022a.

Threatened plant species

More than 58 plant species found in the parks are listed as threatened under the BC Act, including 3 critically endangered species, 25 endangered species and 26 vulnerable species. Of these, 51 have been recorded in Blue Mountains National Park and 16 recorded in Kanangra-Boyd National Park (see Appendix C). Blue Mountains National Park also supports one endangered plant population listed under the BC Act and 3 species of threatened fungi (*Hygrocybe anomala* var. *ianthinomarginata*, *H. aurantipes* and *H. reesia)* found associated with gallery warm temperate forests. A number of the species are also listed as threatened under the Commonwealth EPBC Act.

Populations of a number of these threatened species, including Kowmung hakea, *Solanum armourense*, Coveny's zieria, dwarf mountain pine, mountain trachymene, buttercup doubletail and Gordon's wattle, occur at locations in the parks that have been declared **assets of intergenerational significance** under the NPW Act. This declaration recognises the significant contribution of the parks in protecting these species. Conservation action plans outlining the management and monitoring requirements have been prepared for these species consistent with the NPW Regulation. In future, other assets of intergenerational significance may be declared in the parks.

Additional threatened plant species have been recorded within 5 km of the parks and could potentially exist in the parks. A number of other plant species in the parks are considered rare or threatened (Briggs and Leigh 1996).

Native animals

At least 21 **ground mammal species** are thought to occur across the parks, with all species present in Blue Mountains National Park and 16 present in Kanangra-Boyd National Park (DPE 2022a; DEC 2004b,c; DECC 2007b, 2008e, 2009b). Commonly encountered macropods include the swamp wallaby, red-necked wallaby and eastern grey kangaroo (DEC 2004b,c). The common wallaroo is restricted to the western parts of the parks, while bush rats and brown antechinus occur across a range of forested environments. The swamp rat is less common and found mainly in upland swamps (DECC 2009b). Long-nosed bandicoots have been occasionally encountered in the Blue Mountains National Park, such as in Burralow Swamp and in heath communities (DECC 2008e). Known locations for platypus in the parks include the Kowmung, Hollanders, Jenolan and Abercrombie rivers (DEC 2004b), while anecdotal records of platypus also exist for the Grose River (DECC 2008e). Common wombats have been observed in most vegetation types where surveys have been undertaken but are frequently recorded in Montane Sheltered Forests (DEC 2004b,c).

At least 10 **arboreal mammal species** are found in the parks (DPE 2022a; DEC 2004b,c; DECC 2007b, 2008e, 2009b; Smith et al. 2019). Commonly recorded species include the common brushtail possum and the common ringtail possum (DECC 2009b), which are well adapted to the dry sandstone woodlands, forests and gully systems of the parks. Mountain brushtail possums and yellow-bellied gliders are more commonly found in moister gullies and forests (DECC 2009b). Sugar gliders are frequently recorded feeding in flowering stringybarks on the less fertile sandstone ridge tops and slopes in the north-east part of Blue Mountains National Park (DECC 2008e).

Twenty-two **bat species** have been recorded across the 2 parks, with all known species present in Blue Mountains National Park and 16 in Kanangra-Boyd National Park. These include the grey-headed flying-fox, little red flying-fox (Blue Mountains National Park only) and 16 species of small insectivorous microbats that comprise both tree-dwelling and cave-roosting species (DPE 2022a; DEC 2004b,c; DECC 2007b, 2008e, 2009b). The species composition of the microbats in the parks is typical of that found in the Sydney Basin hinterland plateau (DECC 2008e). Although no caves in the parks are confirmed as maternity roosting sites, several populations of obligate cave-roosting bats can be found, including at least 9 threatened species (see below). Commonly encountered species include the little forest bat, large forest bat, southern forest bat, Gould's long-eared bat, chocolate wattled bat and Gould's wattled bat (DEC 2004b,c, 2008e).

At least 254 species of **native diurnal birds** (active in daylight) occur across the parks, 253 of which can be found in Blue Mountains National Park and 195 in Kanangra-Boyd National Park (DPE 2022a; DEC 2004b,c; DECC 2007b, 2008e, 2009b). The most common species are those occupying the shrubby, dry sclerophyll forests, which cover a large proportion of the parks. Typical species include the white-throated treecreeper, spotted pardalote and the

New Holland honeyeater (DECC 2009b). Wrens and fruit-eating pigeons are commonly found in the rainforests and wet sclerophyll forests in gullies and gorges. In the upland or 'hanging' swamps that characterise the higher elevations of the parks, more common species include the southern emu-wren and beautiful firetail. Transition forests, particularly the Cumberland Shale-Sandstone Forest, found on the eastern boundary of Blue Mountains National Park (DECC 2008e), support species that are not found elsewhere in the parks, including the jacky winter and little lorikeet. The white-winged chough occurs in these transition forests and also on the Boyd Plateau in Kanangra-Boyd National Park. The parks also protect populations of diurnal birds believed to be in decline in New South Wales, including the eastern yellow robin, rufous whistler (DEC 2004b,c), scarlet robin, flame robin, wedge-tailed eagle and the white-throated needletail (Barrett et al. 2003). Many of the birds found in the parks are resident, while others are migratory, seasonal visitors or nomads. Important migratory species include cuckoos, the threatened regent honeyeater and the swift parrot, which depend on winter-flowering eucalypts in grassy woodland habitats during seasonal migrations (DECC 2007a).

Eleven species of **nocturnal bird** are known from the parks, including 6 species of owl (DPE 2022a; DEC 2004b,c; DECC 2007b, 2008e, 2009b). The most commonly recorded nocturnal birds are the southern boobook, Australian owlet-nightjar and tawny frogmouth.

At least 33 **frog species** have been recorded from Blue Mountains National Park and 22 from Kanangra-Boyd National Park (DPE 2022a; DEC 2004b,c; DECC 2007b, 2008e, 2009b). The species recorded in the parks are typical of the Greater Blue Mountains and include all the characteristic sandstone species. Commonly recorded species include the common eastern froglet, Verreaux's tree frog, Peron's tree frog and the leaf-green tree frog (DEC 2004b,c; DECC 2007b, 2008e, 2009b).

Sixty-seven **reptile species** have been confirmed as occurring in Blue Mountains National Park, including 33 skinks, 20 snakes, 5 geckos, 4 dragons, 2 goannas, 2 legless lizards and one turtle species (DPE 2022a; DEC 2004c; DECC 2007b, 2008e, 2009b). Forty-five species of reptile have been confirmed from Kanangra-Boyd National Park, including skinks, snakes, dragons, goannas and geckos (DPE 2022a; DEC 2004b). The parks support a diverse mix of reptiles, including high-altitude specialists, litter-dwelling species, low-altitude species and water-loving species (DEC 2004b,c). Species typical of more coastal hinterland habitats, such as the copper-tailed skink and the eastern snake-necked turtle, occur at lower altitudes in the parks, while species such as the pale-flecked sunskink are more likely to be found in mid to high-altitude landscapes (DEC 2004c). A distinctive suite of cool-climate specialists, such as the highland copperhead and tussock skink also occur in the higher-elevation sections of the parks (DECC 2009b).

Terrestrial invertebrates include insects, spiders, centipedes, millipedes, worms, slaters and landhoppers. The Greater Blue Mountains contain a diverse and rich invertebrate fauna, and while they form a significant part of the animal diversity of the parks, most are undescribed. It is estimated there are 4,000 moth and 125 butterfly species (DECC 2009a). Scientific studies on invertebrates in the parks, such as stick insects, flower beetles, *Coleoptera*, *Zygaenidae* moths, plant-pollinating insects, dragon and damsel flies and minute moss beetles have been undertaken by both Australian (Sydney, Queensland) and international (USA, France, Japan, Holland and Spain) research institutions.

Threatened animal species

There have been 53 threatened animal species recorded in the parks (Appendix D) and additional threatened animal species have been recorded nearby (within 5 km of the parks) and may also occur in the parks. The following sections provide detail on those species for which the parks are particularly significant.

Threatened species of **ground mammals** recorded in the parks include the spotted-tailed quoll, brush-tailed rock-wallaby, southern brown bandicoot (eastern) and New Holland mouse. Spotted-tailed quolls have been identified in several areas in Kanangra-Boyd National Park, including Sally Camp Creek, Mount Krungle Bungle and near Oaky Camp. In Blue Mountains National Park, signs of spotted-tailed quolls have been found at Mount Werong (DEC 2004c) and in the Linden Ridge area (DECC 2008e). Suitable habitat for the spotted-tailed quoll occurs in both parks in the moister vegetation types across the sandstone plateau, such as gully lines and sheltered slopes. The species is expected to be relatively widespread in the parks, albeit at low densities (DEC 2004b,c; DECC 2008e). The brush-tailed rock-wallaby has also been recorded in both parks, and Kanangra-Boyd National Park is considered to contain high-quality habitat for this species, however, there are low numbers of records (DECC 2008f). Key sites include the rocky gorges and escarpments of the Wollangambe River, lower Grose Valley, and potentially the escarpments and steep slopes of Kanangra Gorge and Coxs River (DEC 2004b).

Five species of **threatened arboreal mammal** have been recorded in the parks. Yellow-bellied gliders have been observed within the steep gorges and slopes of the Murruin Creek catchment, around Little Wombeyan Creek and the Maneveland Management Trail (DEC 2004c). The koala has been observed in several areas in Blue Mountains National Park, including around Mount Werong and Bowens Creek (DEC 2004c; DECC 2009b), and in Kanangra-Boyd National Park around the Kowmung and Jenolan rivers. Both parks contain suitable koala habitat where significant numbers of grey gum and/or forest red gum occur, although koalas are likely to occur in low numbers. The southern greater glider is relatively common at higher elevations but has declined at lower elevations (Smith and Smith 2020).

The parks support 9 **threatened bat species** and the karst systems in the parks are particularly significant for the conservation of bats. Colong caves are known to sustain a roosting population of the large bent-winged bat, while Church Creek, Billys Creek and Tuglow (all in Kanangra-Boyd National Park) provide potential roost sites for the large bent-winged bat and the large-eared pied bat (DEC 2004b). The eastern false pipistrelle is found in higher elevation forests such as on the top of Mount Werong and south of Banshea Road in Blue Mountains National Park (DEC 2004c) and the Boyd Plateau in Kanangra-Boyd National Park (DEC 2004c). The south-western section of Blue Mountains National Park and Kanangra-Boyd National Park may be particularly important areas for the greater broad-nosed bat, as populations found here are approaching the western limit of the species' range (DEC 2004b,c).

South-eastern areas of Blue Mountains National Park, along with other protected areas in the Greater Blue Mountains Area World Heritage property, are likely to be important to the **grey-headed flying-fox** for foraging and habitat. There are no known flying-fox camps in the parks, although a number do occur close to park boundaries.

At least 17 **threatened diurnal bird species** occur in the parks. The black-chinned honeyeater, regent honeyeater and swift parrot are irregular visitors to the southern and eastern edges of Blue Mountains National Park, visiting during prominent flowering events in communities such as the Cumberland Shale-Sandstone Transition Woodland and Sydney Hinterland Transition Forest (DECC 2008e). Regent honeyeaters are also found in Grassy Box – Ironbark Woodlands or River Oak Forests, such as occur along Coxs River. Other threatened grassy woodland birds known to occur in the parks include the speckled warbler, brown treecreeper and diamond firetail (Barrett et al. 2003).

Four **threatened species of owl** occur in the parks. The barking owl, considered to be the rarest owl species in the Sydney Basin (DECC 2007a,b), has been recorded in both parks (DPE 2022a), although very occasionally. This species prefers the open grassy woodlands at lower elevations that mostly occur adjacent to the parks in the Wolgan and Capertee valleys. The powerful owl and the sooty owl have also been recorded in both parks (DEC

2004bc; DPE 2022a). The powerful owl is known mainly from the south-west area of Blue Mountains National Park, between the Morong and Kowmung rivers. The masked owl has been reported during surveys in Blue Mountains National Park, and while potential habitat exists, the species has not yet been recorded in Kanangra-Boyd National Park.

Six **threatened frog species** have been recorded in the parks. Blue Mountains National Park is of particular significance to the stuttering frog, which is known from Ruby and Mount Werong creeks. The species has experienced a dramatic decline in population size in the southern portion of its range (Daly et al. 2002; Gaia Research 2006), and populations in the Blue Mountains area now represent the only extant populations of the species in the Greater Sydney Basin. The red-crowned toadlet is restricted to the Hawkesbury and Narrabeen sandstone areas of the Sydney Basin bioregion. The species has been recorded from several locations in the northern section of Blue Mountains National Park, including the Linden Ridge area (DECC 2008e).

There are few records of the giant burrowing frog in the parks, although hanging swamps and creek headwaters are likely to provide suitable habitat for the species. The western limit of the giant burrowing frog in the Sydney Basin is formed by the western edge of the Blue Mountains plateau, and the species is no longer thought to persist in Kanangra-Boyd National Park (DEC 2004b). The booroolong frog has been recorded from Blue Mountains National Park (Anstis et al. 1998; DPE 2022a), however, it is thought to no longer exist in the park despite the presence of suitable habitat. There have been no recent sightings of the booroolong frog in Kanangra-Boyd National Park, although calls were heard in 2008 near Beefsteak Creek (DPE 2022a), and high-quality habitat can be found around the south-western boundary of the park.

Three **threatened reptile species** have been recorded in the parks. The endangered broad-headed snake, which is restricted to the Hawkesbury and Narrabeen sandstones of the Sydney Basin bioregion, has been recorded from several locations in the northern sections of Blue Mountains National Park (DECC 2008e). The Blue Mountains water skink is restricted to sedge and shrub swamps in the mid and upper Blue Mountains and is particularly vulnerable due to its limited geographic distribution.

Rosenberg's goanna (heath monitor) appears to be sparsely scattered across the Blue Mountains, particularly on ridgelines and upper slopes. The species has been sighted in Kanangra-Boyd National Park near Redcliff Creek and has also been observed just outside the eastern boundary of the park in exposed Blue Mountains sandstone woodland (DEC 2004b,c; DPE 2022b).

Two threatened invertebrates, the giant dragon fly, listed as endangered under the BC Act, and Adam's emerald dragonfly, listed as endangered under the *Fisheries Management Act 1994* (DPI 2022a), have been recorded in the parks. One species of **fish**, the Macquarie perch, which is listed as endangered under the Fisheries Management Act, is also thought to occur in both parks (DPI 2015).

3.3.1 Management considerations and opportunities

The **NPWS threatened species (zero extinctions) framework** (NPWS 2021) outlines a series of actions designed to secure and restore threatened species populations, specifically to prevent extinctions on the national park estate and to stabilise or improve the on-park trajectory of all threatened species. Actions that will be taken under the framework include identification of assets of intergenerational significance, acquisition of key threatened species habitat, establishment of a network of feral predator–free areas and establishment of an ecological health framework across national parks.

Strategies for the conservation of threatened species, populations and ecological communities have been set out in the **NSW Biodiversity Conservation Program**. Actions

listed in each of these strategies are prioritised and implemented through the Saving our Species program, which aims to maximise the number of threatened species that are secured in the wild in New South Wales for 100 years. The parks contain priority management sites for a number of threatened ecological communities, plant and animal species. Management actions at these sites may include weeding, controlling erosion, revegetation and monitoring.

Many recovery plans for NSW threatened species have previously been prepared and may still provide useful information, but they no longer determine the actions required for the conservation of threatened species in New South Wales. Recovery strategies for threatened species are now prepared under the Biodiversity Conservation Program. The Australian Government prepares recovery plans for nationally listed threatened species under the EPBC Act. These plans apply to nationally listed threatened species occurring in the parks.

The NSW State Vegetation Type Map includes a representation of the plant community types that occur in the parks (DPE 2022c). The **vegetation mapping** that supplies the map has been conducted in the parks at varying scales. The vegetation of both parks was mapped on a broad scale in 2000 (NPWS 2000a), identifying regional plant communities. In 2001, vegetation in the Warragamba Special Area was mapped at a fine-scale and comprehensive surveys were undertaken (NPWS 2003b). In 2003, an area of Blue Mountains National Park north of the Warragamba Special Area and south of the Great Western Highway was surveyed and mapped at a scale that allowed plant communities to be identified (DEC 2006a). Vegetation patterns, at a broad scale, across the north-east of the park were compiled by Tozer et al. (2006). Fine-scale mapping of the north-west section of the park, supported by vegetation survey plots in and adjacent to the park, is now available in the State Vegetation Type Map (DPE 2022c).

The **main threats to native plants** in the parks include weeds, feral animals and pathogens (see Section 3.4), inappropriate fire regimes (see Section 3.5) and inappropriate human activities such as the removal of bush rock and wood. **Climate change** (see Section 3.6) has also been identified as a threat to park values as it intensifies the effects of threats such as fire, weeds and hydrological processes (including erosion and sedimentation).

The **bushfires of the 2019–20 season** were unprecedented in their extent and intensity and had a significant impact on native plants and animals. The fires affected more than 70% of the Greater Blue Mountains Area World Heritage property. The scale of the bushfires impacted large areas of habitat for species and ecosystems that were either still recovering from the impacts of previous fires or are not adapted to fire.

NSW has undertaken assessments to understand the impacts of the 2019–20 bushfires on plants, animals and communities (DPIE 2021c). These findings inform New South Wales' prioritisation of species and ecological communities for field assessments of the impacts and threats to natural post-fire recovery, and for targeted conservation action over the medium term (DPIE 2021d).

Track and trail maintenance has the potential to impact on plant species including several threatened species that are known from locations close to tracks and trails, including Coveny's zieria, *Acacia baueri* subsp. *aspera*, Cambage kunzea and the endangered population of *Pultenaea villifera*. Some facilities (e.g. powerlines, roads, utility access areas) are close to, or traverse, threatened plant species habitats (e.g. easements traversing *Pultenaea villifera* in southern Blue Mountains National Park). Management of these facilities must ensure park values are protected.

In addition to known threats there is **insufficient knowledge** of the distribution, ecology and threats to rare plant species within the parks.

Box 11: Volunteers caring for the parks

A number of volunteer programs operate in the parks with trained and experienced volunteers engaging in activities such as bush regeneration, site rehabilitation, visitor surveying and ecological data collection.

The programs supported by volunteers include the Great Grose Weed Walk, rehabilitation programs on the Kowmung River and the control of *Erica lusitanica* and St John's wort in areas of the Blue Mountains Shale Cap Forest endangered ecological community.

NPWS particularly acknowledges the invaluable contribution of the many volunteer groups engaged in pest management programs in Blue Mountains and Kanangra-Boyd national parks. These groups are integral to pest management, and NPWS is committed to maintaining these partnerships and developing new partnerships to achieve effective pest management across the parks.

A number of threatened plant species and communities in the parks are subject to **particular threats** and have specific management requirements:

- The 2019–20 bushfires in the Blue Mountains burnt large areas of dry eucalypt forest, which are adapted to recover after fire, but also affected **fire-sensitive swamp, basalt and shale forest communities** which are now at high risk.
- Blue Mountains National Park is particularly important for the conservation of **Gordon's wattle** which is endangered at both state and federal levels. The park protects a relatively large proportion of the NSW population, which is threatened by inappropriate fire regimes and habitat disturbance associated with recreational activity and bush rock removal (DPE 2022b).
- ***Solanum amourense*** is known from only 4 locations in New South Wales, 3 of which occur in Blue Mountains National Park. The species occurs in eucalypt woodland, on steep rocky hillsides with shallow soils. Being fire sensitive, and having a small population size and fragmented distribution, the species is threatened by inappropriate fire (DPE 2022b).
- Blue Mountains National Park protects the only known populations of several threatened plants, including:
    - **Dwarf mountain pine** only occurs within the spray zone or seepage areas of waterfalls associated with steep, sandstone cliffs and ledges between 680 and 1,000 m above sea level. Plant survival is affected by water quality, weed invasion and changes in groundwater levels or surface water flows (DPE 2022b). Climate change, and its associated influence on available water and fire frequency, is also likely to affect the persistence of populations in the park.
    - The largest known population of **Fletcher's drumsticks** occurs on the sheltered cliffs within the spray zone of a single waterfall in Blue Mountains National Park. The species is now known to be scattered throughout the Grose Valley within sandstone cliff soaks and on sheltered south-facing cliffs and ledges. The species' small and highly localised populations and specific habitat requirements make it susceptible to environmental changes, with the primary ongoing threat being the increasing frequency and intensity of fire in its habitat. It is also at risk from the activities of rock climbers both through direct disturbance and trampling of plants and the accidental introduction of *Phytophthora cinnamomi* (a soil pathogen that causes root rot disease in some species) into its habitat (DPE 2022b).

  - **Evans sedge** is currently known from just 3 locations, all in Blue Mountains National Park but close to its boundaries, between Blackheath and Wentworth Falls (DPE 2022b).
  - **Blue Mountains cliff eyebright** is a semi-parasitic perennial herb endemic to the upper Blue Mountains, where it occurs on wet or damp vertical sandstone rock faces in Blue Mountains National Park. Small population size makes the species susceptible to stochastic (i.e. randomly determined) events such as fire. Weed invasion and changes in moisture regimes may also negatively affect this species (DPE 2022b).
  - **Coveny's zieria** is known from only one location, Narrow Neck Peninsula in Blue Mountains National Park. Due to its restricted distribution, the species is susceptible to local extinction, and can be disturbed by road maintenance activities (DPE 2022b).
  - Similarly, most known populations of ***Epacris hamiltonii*** occur within a single, 5 km^2 area of Blue Mountains National Park. The species is recognised as threatened by *Phytophthora cinnamomi*, high-frequency fire, trampling and weed invasion, notably from Scotch broom, gorse, willow and riparian weeds (DPE 2022b).
- The deep alluvial valley sands of the Kedumba Valley support tall, closed forest containing the vulnerable **Camden white gum**. Blue Mountains National Park protects one of 2 subpopulations for the species (DPE 2022b).
- ***Epacris sparsa*** has a very restricted distribution in New South Wales. The species occurs in the lower Grose River catchment and is known from fewer than 10 small populations in Blue Mountains National Park.
- Kings Tableland, in Blue Mountains National Park, contains a particularly high number of threatened species. These include ***Acacia baueri* subsp. *aspera***, which occurs only in the Sydney region, and the shrub ***Acrophyllum australe***, which also has a restricted distribution, occurring at only 27 sites in New South Wales (DPE 2022b). *Acacia baueri* subsp. *aspera* occurs in low, damp heathlands and can be threatened by recreational activities, roadside maintenance and weed invasion. The role of fire in the persistence of this species is unknown (DPE 2022b). *Acrophyllum australe* is susceptible to weed invasion and may also be threatened by changes in hydrology and inappropriate fire regimes.
- Populations of **Kowmung wattle** are found only in Kanangra-Boyd and Blue Mountains national parks, in the Kowmung and Coxs rivers areas. Although many wattles recover well after fire (by germination of the seed bank), too-frequent fire may threaten this species if seed banks are depleted by repeated, short intervals between fires (DPE 2022b). Weed invasion and disturbance from feral pigs may also negatively affect populations (NPWS 2000b).
- **Kowmung hakea** is confined to a small area (18 km^2) of the Kowmung Valley (DPE 2022b). The small population size, highly restricted distribution and its susceptibility to fire make this species particularly susceptible to environmental changes and natural disturbances. Unsuitable fire frequency and intensity may limit germination or kill adult plants and could ultimately lead to a decline or extinction of Kowmung hakea population at the site (NPWS 2023b).
- **Camden woollybut** has a moderately restricted distribution across New South Wales, and Kanangra-Boyd National Park supports the only known populations in a conservation reserve (DPE 2022b). The species occurs on the north-western part of the Boyd Plateau and is threatened by weed invasion and grazing by introduced animals.
- Blue Mountains National Park supports a small component of the endangered ***Pultenaea villifera*** population that is found in the Blue Mountains local government area. The population occurs in dry sclerophyll forest and woodlands on sandy soil and is

threatened by disturbance during trail construction and maintenance, trampling, weed invasion and, potentially, inappropriate fire regimes (DPE 2022b).

- South-facing cliffs adjacent to seepages and watercourses have been identified as important habitat for several endemic cliff species of the Blue Mountains, including **Blue Mountains cliff eyebright** and **Fletcher's drumsticks**. At these locations rock climbing activities may pose a threat to these species.
- A significant small stand of the threatened **black gum** is found in the southern Blue Mountains National Park in the Wiarborough area.

The **primary threats** to habitats and animal species in the parks include feral animals (see Section 3.4), weed invasion (see Section 3.4), inappropriate fire regimes (see Section 3.5), sedimentation and the removal of bush rock and firewood. **Climate change** (see Section 3.6) is also a threat as its associated influence on hydrological process and fire regimes will place additional pressure on animals and their habitats.

A number of the plant communities in the parks that provide important habitat for threatened animal species are subject to specific threats:

- **Grassy box woodlands** were once extensive in the Greater Blue Mountains, occurring on high-fertility soils of the Cumberland and Illawarra coastal plains and in the rain shadow valleys of the southern Blue Mountains (DECC 2007b). Grassy box woodlands provide important habitat for threatened birds such as the barking owl and migratory specialists, including the regent honeyeater and swift parrot (DECC 2009b). The largest area of semi-intact grassy box woodland in the Greater Southern Sydney region occurs in the Burragorang Valley in the Warragamba Special Area and it has been identified as the **single most significant landscape** for the conservation of animal diversity in the region (DECC 2007b). This community represents key habitat for at least 16 of the 45 highest ranked priority animal species in the Greater Southern Sydney region. In the parks, threats to grassy box woodland communities include invasion by exotic perennial grasses and altered fire regimes.
- **Upland swamps** occur on the Narrow Neck Plateau and Kings Tableland in Blue Mountains National Park, where they form part of the Blue Mountains Swamps in the Sydney Basin bioregion vulnerable ecological community. These swamps support a unique suite of plants and animals and a particularly high diversity of snakes, skinks and frogs, including threatened species such as the Blue Mountains water skink, giant dragonfly, Littlejohn's tree frog, giant burrowing frog, red-crowned toadlet and Rosenberg's goanna. Upland swamps are sensitive to hydrological changes and are naturally isolated. As a result, the animals that use the swamps often have a poor capacity to disperse, making them particularly vulnerable to local extinction (DECC 2007b, 2009b). The red fox is recognised as a particular threat to animals that occur in upland swamps (DECC 2007b).
- **Sandstone escarpments and pagoda formations** occur along the western boundary of Blue Mountains National Park and support some of the highest priority animal species in the region, including the threatened brush-tailed rock-wallaby and broad-headed snake. High-intensity or frequent fire can damage overhangs, sandstone exfoliations and bat roosting sites in this community. In these habitats, site-based management for the brush-tailed rock-wallaby and for larger bat roosts is considered appropriate (DECC 2009b).
- **Alluvial woodlands and forests** are found on creek banks and river flats with deep, fertile alluvial soils. In the parks the community is found around the Wollondilly, Kowmung, Coxs and Kedumba rivers. Alluvial woodlands and forests support some of the most threatened animal species in the region, including the booroolong frog, southern myotis and regent honeyeater (DECC 2007b). In these communities, feral pigs are a particular threat to burrowing animal species.

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- Examples of **Sydney hinterland transition woodlands and forests** occur in the north-eastern section of Blue Mountains National Park (particularly in the Vale of Avoca area) where loamy soils are found. These communities provide habitat for the threatened regent honeyeater, swift parrot, squirrel glider, eastern coastal free-tailed bat, grey-headed flying-fox, masked owl, black-chinned honeyeater, greater broad-nosed bat, speckled warbler and koala. These communities also provide habitat for the regionally significant jacky winter. Threats to these communities and their animal species include high-frequency fire, loss of hollow-bearing trees, feral animals, weeds and, potentially, the removal of dead wood and dead trees (DECC 2008e).
- **Scarp warm temperate rainforest** is found in the tributaries of Dawes and Linden creeks and Wilderness Brook, as well as some sheltered slopes in the Grose Valley in Blue Mountains National Park. The rainforest provides potential habitat for the stuttering frog, sooty owl, powerful owl and spotted-tailed quoll (DECC 2008e). High-frequency fire and climate change could have a significant influence on this community.
- **North-facing escarpment lines, rocky slopes and creek lines** are not well defined by a plant community type, however, north-facing escarpment lines and rocky slopes are particularly important to the brush-tailed rock-wallaby and the broad-headed snake (DECC 2008e).

Other specific considerations for the conservation of threatened animals and other species in the park include:

- The **extensive fires** of the 2019–20 season had a significant impact on populations of animal species, including threatened species such as the **southern greater glider** which has a high dependence on large, hollow-bearing trees. The greater glider's conservation status has been elevated to endangered under the EPBC Act due to population decline and reduced habitat distribution following the 2019–20 bushfires.
- The **spotted-tailed quoll** is threatened by predation from foxes and feral cats and, potentially, by high-frequency fire. Quolls may also be impacted by competition from feral pigs, which are common on the Boyd Plateau (DEC 2004b) and in the south-western section of Blue Mountains National Park (DEC 2004c).
- The recovery plan for the **brush-tailed rock-wallaby** (DECC 2008f) identifies a number of threats to the species, including predation by foxes, feral dogs and feral cats; competition with feral goats for refuge areas; and inappropriate fire management.
- Threats to the **yellow-bellied glider** include predation by foxes, dingoes and feral dogs and, potentially, habitat alteration or reduction due to wildfire (NPWS 2003c)
- Damage and disturbance to roosting sites are the greatest threats to **bat species** in the parks, along with predation by feral cats and foxes, and possibly damage to roost caves from wildfire. Visitation to sections of caves used by bats for maternity or hibernating purposes has the potential to result in bat mortality and reduced levels of fecundity.
- **Grey-headed flying-fox** populations in the Blue Mountains area are threatened by habitat loss. In addition, inter-annual variation in food availability, which over time is predicted to be affected by climate change, may strongly influence the seasonal movements and local occurrences of this species.
- Threats to the **barking owl** include removal of dead and fallen timber, which removes cover for terrestrial prey species, competition for nesting hollows from feral honeybees, predation by foxes and potential competition for prey with foxes and feral cats (NPWS 2003d).
- Based on available knowledge, fire appears to have a variable influence on **large forest owls**. The powerful owl and the sooty owl appear to prefer long-unburnt forest, while the masked owl shows a preference for forest with structural diversity, mosaic in nature, with patches that are both burnt and unburnt (DEC 2006b). However, infrequent fires may

enhance the foraging habitat and prevalence of terrestrial prey species for forest owls generally (DEC 2006b). Foxes are likely to prey on fledgling powerful and masked owls (DEC 2006b).

- The introduced amphibian chytrid fungus (*Batrachochytrium dendrobatidis*) is a current or potential threat to the **threatened frog species** in the parks. Frog populations above 400 m elevation and stream-breeding species (e.g. booroolong, giant burrowing and stuttering frogs) are particularly susceptible (NSW Scientific Committee 2003). Chytrid fungus has been detected in stuttering frog populations at Ruby Creek in the south of Blue Mountains National Park (DEC 2004c), and the disease is also considered likely to occur in frog populations in Kanangra-Boyd National Park. Infection of frogs by amphibian chytrid causing the disease chytridiomycosis is a listed key threatening process under the BC Act (NSW Scientific Committee 2003) and the disease is also listed under the EPBC Act. Threatened frog species in the parks are also considered susceptible to predation by exotic fish, and loss of and/or changes to habitat caused by frequent fire and climate change.
- Areas of outcropping and exfoliating rock with adjacent woodland supporting hollow-bearing trees are considered important to the conservation of the **broad-headed snake**. Threats to this species include disturbance of bush rock (Shine and Fitzgerald 1989), removal of dead wood, and illegal collection of the species itself (DECC 2008e). In Blue Mountains National Park, the species is also likely to be impacted by feral goats, through the accumulation of goat droppings and general degradation of habitat (NSW Scientific Committee 2004).
- The **Blue Mountains water skink** is particularly vulnerable due to its limited geographic distribution. Threats to this species include habitat degradation (through weed invasion, sedimentation or pollution), predation by feral and domestic cats and inappropriate fire regimes (NPWS 2001).
- The primary threats to the **Rosenberg's goanna** in the parks are likely to be predation by wild and domestic dogs and the removal of dead trees and wood (DPE 2022b).

Management of threatened species in the parks will be assisted by **improved understanding** of the populations, distribution, ecology and habitat requirements of threatened animals in the parks. Priorities are guided by the NSW Government's Saving our Species program but include the spotted-tailed quoll, brush-tailed rock-wallaby, yellow-bellied glider, eastern false pipistrelle, booroolong frog, stuttering frog, bats in the Tuglow, Church Creek, Billys Creek and Colong caves, and threatened animals more generally in the Grose Valley. Improved understanding of the habitat requirements of seasonally migrating animals, and the significance of winter-flowering plants, will assist management of these species. The effect of fire on threatened animals is largely unknown, and more information is needed to refine appropriate fire regimes for important animal habitat.

3.4 Weeds, feral animals and pathogens

Pest species are plants, animals and pathogens that negatively impact the environment, economy and society. The impacts are most commonly caused by introduced species. Pests can have impacts across the range of park values, including impacts on biodiversity, cultural heritage, catchment and scenic values, with several listed as key threatening processes (key threatening processes that are known to affect the parks are listed in Appendix E).

More than 250 introduced plant species have been recorded in the parks. The most significant weed species that are a priority for control are listed in Appendix F. Many of these weeds are a threat to habitat values and threatened plants, animals and ecological communities. Weeds can alter ecosystems by shading or smothering native plants, shading streams and waterways, altering hydrology and increasing the fuel load for bushfires. This

can have profound effects on the structure of terrestrial and aquatic vegetation communities and the species that depend on them. In addition, weed infestations can reduce the aesthetic appeal of the natural environment for public recreation and appreciation and impact on public safety.

The majority of Blue Mountains National Park is free from extensive weed infestation, however, there are localised and scattered occurrences of weeds particularly in areas adjacent to urban and rural development, riparian zones, other drainage lines and transport corridors (see Box 12). Because of its largely undisturbed wilderness condition, the majority of Kanangra-Boyd National Park is free from high densities of weeds. Localised occurrences of concern are associated with disturbed sites such as old logging camps at Budthingeroo, the vehicular trail system, former agricultural properties such as at Whalania Heights, zones with highly altered fire regimes, park boundaries adjoining agricultural and forestry areas, riparian zones including along the Kowmung River and the Glenbrook/Mulgoa/Erskine Creek areas, blackberry in diatremes like St Helena, Glenbrook and areas with high populations of feral animals.

Box 12: Hot spots for weeds – drainage lines, transport corridors and urban fringes

A large range of weeds are found particularly in association with riparian zones, urban fringes, disturbed and open habitat, and roadside areas.

Urban development creates conditions favourable for weed invasion (including nutrient enriched run-off, sewage overflows, high-flow stormwater, soil disturbance, vegetation clearing, dumping of fill and garden waste and garden escape plants). The high density of weeds on urban boundaries of the parks and along creeks and rivers downstream of development is evidence of this issue.

Riparian weeds are found along drainage lines in both parks although the degree of infestation varies, with some waterways dominated by weeds and others relatively free of weeds. Infestations of riparian weeds, including small leaf privet, blackberry, honeysuckle, bridal creeper, crofton weed and wandering creeper, are particularly high in those areas of Blue Mountains National Park that are adjacent to stormwater outlets (OEH 2012).

A large number of weeds (including riparian weeds plus tree of heaven, Scotch broom, bamboo, turkey rhubarb, agapanthus and mother of millions) occur on the bushland fringes of urban areas in the Blue Mountains. Large-scale infestations are strongly associated with urban development and the major road and rail corridors. Many of these species are capable of spreading widely through the parks.

A range of weed species infest roadsides, tracks, trails and other habitats that are either naturally open (e.g. grasslands) or are open as a result of disturbance. Weeds common in these areas include the riparian and bushland weeds listed above, together with prickly pear species, century plant, serrated tussock, Paterson's curse, saffron thistle, whisky grass and other exotic grasses. The Jenolan Caves area is a significant source of weeds for Kanangra-Boyd National Park, with over 70 riparian weed species found along the Jenolan River. Many have spread to the Coxs River and are a threat to Schedule 1 special areas.

Among the most significant feral animal species in the parks (see Appendix F) are wild dogs and red foxes, which are widespread in both parks. Deer (fallow deer and red deer) are an increasing concern. Other pest animals of concern include feral cat, cattle, goat, pig and rabbit populations which vary in their distribution across the parks from widespread to

scattered and isolated populations. Many of these are identified as, or part of, a **key threatening process** under the BC Act (see Appendix E). A localised wild horse population occurs in Blue Mountains National Park. Populations of introduced birds, fish, reptiles and invertebrates also occur in the parks. Feral animals that are currently thought to be in low numbers but are an emerging issue in Blue Mountains National Park include the red-eared slider and the American corn snake.

Dingoes were introduced into Australia from Asia around 4,000 years ago and established across the mainland and on many offshore islands. Since the arrival of the First Fleet in 1788, dingoes have hybridised with domestic and feral dogs. Dingoes and dingo–dog hybrids (collectively known as **wild dogs**) are still widespread across New South Wales, with most **wild dogs** having a relatively high level (>50%) of dingo genetics and continue to fulfill the ecological role of the dingo (Stephens et al. 2015; Cairns et al. 2021). The dingo occurs across all landscape systems in Blue Mountains and Kanangra-Boyd national parks and is regularly sighted in both parks. Generally, high-density populations occur where prey populations are in abundance. For example, habitats that support large eastern grey kangaroo and swamp wallaby populations generally have a healthy dingo population. Genetic research undertaken by Purcell (2010) in the southern Greater Blue Mountains Area World Heritage property has suggested that 80% of the dingoes sampled may be ‘pure’, and the animals sampled could be assigned to one of 8 closely related (or ‘family’) groups.

Feral animals can also be **vectors in the spread of pathogens and animal diseases**, which have the potential to significantly affect native animals and neighbouring domestic animals and stock. Pathogens are agents that cause disease (e.g. a bacterium or fungus) and have the potential to cause widespread and irreversible damage to park values. One of the most common pathogens currently affecting natural values in the parks is phytophthora (see Box 13).

Chytridiomycosis is an infectious disease caused by the **amphibian chytrid fungus** (*Batrachochytrium dendrobatidis)*. It is a highly virulent fungal pathogen affecting amphibians worldwide. Chytrid fungus is widespread in eastern Australia, where it has been linked to high mortality rates and dramatic declines in a number of native frog populations. It is known from frog populations in both parks.

Myrtle rust is a plant disease caused by the exotic fungus *Austropuccinia psidii,* which affects plants in the Myrtaceae family. Myrtle rust infects young, actively growing plant tissue with the impact on infected plants ranging from minor leaf spotting to loss of new growth, defoliation, dieback and death of plants. Spores of myrtle rust are spread by wind, animals and human activity. Myrtle rust is not currently known to occur in the parks, however, it has the potential to impact a range of ecosystems in the parks. Threatened species known to be at risk in the parks include Deane’s paperpark and the critically endangered scrub turpentine. The introduction and establishment of exotic rust fungi on plants of the family Myrtaceae is listed as a key threatening process under the BC Act. Myrtle rust is a national threat recognised under the EPBC Act as part of the novel biota and its impact on biodiversity key threatening process.

Forest eucalypt dieback associated with overabundant populations of bell miners and psyllids has been determined a key threatening process under the BC Act (NSW Scientific Committee 2008). Bell miner assisted dieback (BMAD) is associated with the establishment of bell miner colonies and an overabundance of sap-sucking psyllid insects in the canopy. The persistence of psyllids in the canopy leads to dieback and eventual death of the affected trees. While its current spatial distribution throughout New South Wales is not known in detail, areas of BMAD are known to occur in Blue Mountains National Park. Dieback has been observed in the Blue Mountains Shale Cap Forest endangered ecological community and is potentially affecting areas of Sydney Turpentine-Ironbark Forest endangered ecological community in the mid to lower mountains areas.

Box 13: Phytophthora

Phytophthora cinnamomi (sometimes called cinnamon fungus) is a soil-borne pathogen which infects a large range of plant species and in some circumstances may contribute to plant death where there are other stresses present, such as waterlogging, drought and perhaps wildfire (NSW Scientific Committee 2002).

Infection of native plants by phytophthora is listed as a key threatening process under the BC Act (NSW Scientific Committee 2002) and dieback caused by the root-rot fungus is listed under the EPBC Act (DCCEEW n.d).

Phytophthora is present in both Blue Mountains and Kanangra-Boyd national parks (OEH 2012) and is found in many of the high visitation precincts and popular access routes as well as remote areas and trails with lower levels of public use.

The spread of phytophthora is linked to human, animal (e.g. feral pig) and vehicle movements, and it can also be dispersed in flowing water such as storm run-off. Environmental conditions across the Greater Blue Mountains Area World Heritage property are conducive to infestation by the fungus. There are limited options for the control of this pathogen. Remote catchments may have a higher likelihood of remaining free from infestation with the implementation of a containment strategy.

3.4.1 Management considerations and opportunities

Weeds and feral animals in the parks are affecting threatened species, threatened ecological communities, World/National Heritage values, important cultural heritage values, wild rivers and wilderness areas, water quality and water infrastructure, and economic enterprises of neighbouring properties and catchment areas.

The ***Biosecurity Act 2015*** **and its regulations** provide specific legal requirements for responding, managing and controlling biosecurity risks, including weeds and feral animals. These requirements apply equally to public land and private land. Under this framework, Local Land Services has prepared regional strategic weed management plans and regional strategic pest animal management plans for each of its 11 regions, including the Greater Sydney region (GSLLS 2017, 2018) and the Central Tablelands region (CTLLS 2017, 2018) which include Blue Mountains and Kanangra-Boyd national parks. These plans identify priority weeds and feral animals in each of the regions, plus the appropriate management response for the region (i.e. prevention/alert, eradication, containment or asset protection).

The *NSW Wild dog management strategy 2022–2027* (DPI 2022b) promotes a balance between managing wild dogs in areas where they have negative impacts and preserving the ecological role of dingoes. The conservation of dingoes is listed as one of the goals of the strategy. It is achieved via the development of regional wild dog management plans which focus control on areas where the risk of negative impacts are greatest, and not undertaking control in other parts of the landscape with a low risk of negative impacts from wild dogs, to preserve the natural ecological role of the dingo.

The relevant **NPWS pest management strategy** identifies pest species and priority programs for Blue Mountains and Kanangra-Boyd national parks. The overriding objective of the pest management strategy is to minimise adverse impacts of introduced species on biodiversity and other park and community values while complying with legislative responsibilities. The strategy also identifies where other site-specific or pest-specific plans or strategies need to be developed to provide a more detailed approach. Reactive programs

may also be undertaken in cooperation with neighbouring land managers in response to emerging issues.

The pest management strategy identifies the **highest priority programs for the parks** as those that aim to:

- protect threatened species and threatened ecological communities
- reduce significant impacts on the economic enterprises of neighbours
- protect the water storages for the populations of Sydney and the Blue Mountains
- respond to new and emerging pest threats as they arise
- protect the values of the Greater Blue Mountains Area World/National Heritage property
- protect significant cultural heritage assets.

Management of aquatic weeds in the Sydney Drinking Water Catchment is also a priority as they can present a significant risk to water infrastructure.

NPWS recognises that successfully implementing pest management programs requires a whole-of-landscape approach, involving a range of land management agencies, neighbours, interested individuals, community groups and other stakeholders. A large number of volunteer groups (see Box 11) and land management agencies currently work in partnership with NPWS on pest management programs. NPWS particularly acknowledges the invaluable contribution of the many volunteer groups currently engaged in pest management programs in Blue Mountains and Kanangra-Boyd national parks.

An **integrated approach to weed management** is employed in the parks using a range of techniques at critical times of the year and often targeting more than one species. Methods may include physical removal, herbicide use, fire, biological control and revegetation. Key weed control programs include bush regeneration undertaken by NPWS staff, volunteers and contractors.

Priority programs for weed control are detailed in the pest management strategy for the parks, however, key targets include:

- lantana impacting on shale-sandstone transition forest and riparian zones
- whiskey grass, African lovegrass and a range of other weeds impacting Blue Mountains Swamps endangered ecological community
- a range of weeds (including blackberry, Scotch broom, privet, gorse and Himalayan and Japanese honeysuckle) impacting on threatened plant species including Camden white gum, *Epacris hamiltonii*, smooth bush-pea and *Acacia bynoeana* in Blue Mountains National Park
- English ivy, privet and montbretia impacting the dwarf mountain pine in Blue Mountains National Park
- weeds (including pines, tutsan and blackberry) impacting significant wildlife habitat in Kanangra-Boyd National Park, including that of the endangered booroolong frog
- weeds (including willows, blackberry, gorse, broom, moth vine, pine species, olive species, saffron thistle, serrated tussock, tree of heaven, tutsan and Paterson's curse) impacting World/National Heritage, wilderness and wild river values in both parks
- control of weed infestations in remote areas including willows and blackberry in St Helena, and areas treated by volunteers on the Great Grose Weed Walk.

Priority programs for feral animal control are detailed in the relevant pest management strategy for the parks, however, key targets include:

- **Feral pigs** where they are having a particular impact on:
    - the special areas protecting water supply for the Sydney and Blue Mountains areas

  - threatened hanging swamps (montane peatlands and swamps) in Kanangra-Boyd National Park
  - Blue Mountains water skink and giant dragonfly habitat in Blue Mountains National Park
  - threatened plant species in both parks
  - important Aboriginal cultural heritage sites
  - World/National Heritage and wilderness values in both parks.
- **Wild dogs** where they are impacting native wildlife as well as causing stock losses on properties adjoining the parks, disturbing visitors at camp sites and neighbours on the urban fringe of townships. A proactive wild dog management program is implemented through wild dog management plans, in collaboration with livestock health and pest authorities and local partnerships. While minimising the impact of wild dogs on livestock, the program also aims to conserve dingo populations in core areas of the parks.
- **Feral cattle** where they are impacting the special areas containing water supply for the Sydney and Blue Mountains areas; World/National Heritage and wilderness values in both parks; and white box – yellow box – Blakely's red gum woodland in Blue Mountains National Park.
- **Wild horses** where they are impacting World/National Heritage and catchment values, particularly in the Warragamba Special Area in Blue Mountains National Park (NPWS 2007).
- **Red foxes** where they are impacting threatened species or threatened ecological communities (e.g. Blue Mountains Swamps and eastern pygmy-possum) in Blue Mountains National Park
- **Feral deer** (which are increasing in the parks) where they are impacting World/National Heritage values
- **Feral goats** where they are affecting World/National Heritage and catchment values, broad-headed snake habitat and important Aboriginal cultural heritage.

It is crucial that feral animal impacts on domestic water supply catchments of the special areas are minimised.

Several weed and feral animal control programs have been operating in the parks for a considerable time, including the Great Grose Weed Walk and the wild horse management plan (NPWS 2007), which involves the removal of horses from the World Heritage property. These programs require continuing support and coordination to ensure that progress is maintained or extended. Continuation of programs targeting new and emerging pests, such as the boneseed eradication program, is also important.

Weeds and feral animals at the park–urban interface are an ongoing issue from a local community perspective.

Prescribed burning and wildfire can both increase pest risks and create opportunities for the management of invasive species. Control of fire-responsive weeds is important following large wildfires where the weed seed bank may have been stimulated. Control of feral animals is important following large wildfires, where there are increased threats to biodiversity, such as increased predation by vertebrate pests (e.g. foxes and feral cats) and damage to regenerating plants by vertebrate pests (e.g. goats and rabbits).

As pigs, cattle and wild horses can spread **phytophthora** in the parks, they are a priority for control where phytophthora is present at threatened species sites in the Greater Blue Mountains Area. Management of phytophthora in the parks will follow current best practice management guidelines and aim to minimise the spread of the pathogen and prevent impacts on new species and ecological communities (O'Gara et al. 2005; DPIE 2020a). Actions include avoiding areas where it is present and implementing hygiene protocols, such

as cleaning vehicles, boots and equipment, which can help minimise the spread of the fungus. The construction of new facilities, fire management, trail maintenance, and access for research and infrastructure maintenance should consider phytophthora presence and implement risk management recommendations for its control (DPIE 2020a).

Monitoring of significant weed, feral animal and pathogen infestations and new incursions is an important component of successful pest species management program. Ongoing monitoring and evaluation of adaptive pest management control programs is critical to determine their effectiveness. These review processes also provide new information to enable programs to be continually improved.

3.5 Fire

The terrain, vegetation and climate of the Greater Blue Mountains region make it one of the most **fire-prone** regions in the world (Hammill and Tasker 2010). **Fire is a natural feature** of many environments and is essential to the survival of many native species and plant communities, including the sclerophyll plants with relic Gondwanan taxa (ancient plant varieties) recognised by the World Heritage listing. However, while fire is an essential and natural process in the Greater Blue Mountains, in some circumstances it can also be a threat to park values, life and property.

The **fire history** of the Blue Mountains and Kanangra-Boyd national parks has been documented since the early 1970s. Large fires are also known to have occurred in the 1950s and 1960s and earlier, however, information on these is limited and detailed maps are not available. Most recently, the **bushfires in 2019–20** were unprecedented in their extent and intensity. From late October 2019 to early February 2020, over 196,000 ha (or 73%) of Blue Mountains National Park and over 62,000 ha (or 87%) of Kanangra-Boyd National Park was burnt to varying degrees.

Most bushfires in the parks occur between October and March and, under suitable weather conditions, can burn across large areas. These fires are fuelled by the widespread, flammable dry sclerophyll forests, woodlands and heaths that collectively cover roughly 80% and 65% of Blue Mountains and Kanangra-Boyd national parks respectively (Hammill and Tasker 2010).

Fires in the parks are **primarily driven by weather patterns**, since it is only during dry periods that these forests and heaths are ‘available’ to burn. The region experiences a mix of drier-than-normal and wetter-than-normal years driven by the El Niño-Southern Oscillation climate cycle (ENSO). Major fire seasons have usually only occurred once or twice per decade in association with the drier-than-normal (El Niño) years, though this may increase over time in association with climate change.

Local weather patterns in the parks also influence fire regimes and differ markedly depending on location. At lower altitudes (below about 600 m above sea level), annual rainfall is typically lower and temperatures warmer than at higher altitudes, where it is generally wetter and cooler. Due to these differences, ignitions in the east develop into large fires more often than in the west and south, resulting in a broad pattern of decreasing fire frequency with increasing altitude (for the recorded fire history since the 1960s). Some areas are the exception to this pattern (e.g. parts of the upper Blue Mountains), where human-caused ignitions close to villages and along tracks and trails have probably led to a greater number of fires than may have otherwise occurred.

The **rugged terrain** of Blue Mountains and Kanangra-Boyd national parks can limit the spread of fires but can also restrict access during suppression operations. Rocky areas, escarpments and deep, moist gullies can reduce or stop the spread of fires, except during severe fire weather or extended dry periods.

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Generally, **adverse fire weather** in the Greater Blue Mountains includes strong winds from the west (or north-west or south-west), and the main direction of fire spread is towards the east. At a local scale, however, the steep terrain, narrow gullies and escarpments can create unpredictable fire behaviour and produce rapid and dangerous runs of fire in any direction. Spot-overs (i.e. new, isolated ignitions caused by smouldering bark, sticks or leaves blown by strong winds, sometimes kilometres ahead of the main fire front) are also a feature of fire behaviour in the Blue Mountains and add to the challenge of fire suppression during adverse weather. The number of days per year with dangerous fire weather is predicted to increase in the future under climate change (see Section 3.6), and the risk of fire is therefore also likely to escalate.

Patterns of urban development across the Blue Mountains and visitor activities in the parks also influence fire patterns and fire management. Many of the bushfires in Blue Mountains and Kanangra-Boyd national parks are started by lightning, although there is also a significant number started by people by both deliberate and accidental ignitions, including arson, escaped camp fires and burn-offs, or sparks from machinery. Bushfires can start in the parks and spread to adjoining lands, although fires also originate off-park and burn into the parks.

NPWS takes an **integrated approach to fire management**, as detailed in the *Fire management manual* (NPWS 2022b). This includes:

- fire prevention through fuel management operations and other measures
- fire preparedness through maintaining NPWS staff training including incident management and remote area firefighting
- fire response through coordinated surveillance of ignitions and fire suppression both on and off the parks
- fire recovery through the rehabilitation of areas affected or damaged by fire.

NPWS maintains cooperative arrangements with other fire authorities and surrounding landowners and is actively involved in the Blue Mountains, Hawkesbury, Chifley, Cumberland and Southern Tablelands bush fire management committees. Cooperative and coordinated fire management arrangements include fire planning, fuel management and information sharing. Hazard reduction programs, ecological burn proposals and fire trail works are submitted annually to the bush fire management committees on a fire district basis. Ongoing positive relationships with other fire management authorities are vital for successful strategic planning and overall management of fire in the parks.

Fire management strategies have been prepared for the parks. The strategies outline the vegetation and fire history of the parks, key assets within and adjoining the parks, including sites of natural and cultural heritage value, fire management zones, fire control advantages such as management trails and water supply points, and operational guidelines for fire management activities (NPWS 2004, 2006a). Fire management strategies require regular review to ensure they are consistent with NPWS policy and procedures and take account of new information.

Fire management for biodiversity is based on the principle that species have limits of tolerance to repeated fire. Fire frequency guidelines (see Box 14) aimed at maintaining biodiversity in the long term have been developed by NPWS for each of the broad vegetation formations that occur in New South Wales (Kenny et al. 2004; NPWS 2022b). These guidelines specify upper and lower intervals (i.e. numbers of years) between fires that are predicted to maximise plant diversity.

However, where more detailed, local information is available on particular plant communities or species, the guidelines are designed to be modified. This has been done for some of the threatened species and ecological communities in the parks (Keith 2010), although this

information is not available for most threatened species. Information is also generally not available on the effects of fire intensity and season on biodiversity. These factors are expected to be particularly important in a fire-prone region such as the Blue Mountains.

Box 14: Application of fire interval guidelines

The **fire interval guidelines** are critical in guiding fire management in the parks (NPWS 2022b) and have been adapted in the *Bush fire environmental assessment code* (RFS 2021).

The code describes the environmental basis on which prescribed burns and other fuel management operations are planned, assessed and approved in New South Wales. It includes details about how to protect environmental values during fuel management activities – including riparian zones, threatened species, ecological communities and ecosystems. The Department of Climate Change, Energy, the Environment and Water is the certifying authority under the code for all fuel management operations on NPWS estate.

The fire interval guidelines are used to assess the fire-ecological status of a landscape and to inform fire management planning, including the location and timing of prescribed burns and identifying areas that need to be protected from fire. Six categories are defined, depending on the vegetation type and known history of fires at a site. These categories are: too frequently burnt, within threshold, vulnerable to frequent fire, long unburnt, unknown, and no regime assigned (NPWS 2022b).

It is not necessarily desirable that all vegetation of a certain type in a region be in the 'within threshold' category. For instance, there are likely to be ecological benefits associated with 'long unburnt' vegetation (e.g. old stands of vegetation are important habitat for many animals). Vegetation that is 'too frequently burnt' is of concern from an ecological perspective. These are areas that have experienced 2 or more fires at less than the recommended minimum interval, and consequently may have experienced a loss of plant (or animal) diversity. Such areas should be managed to exclude fire as far as possible. Assessment of the parks is conducted in this way on a regular basis and used to update the reserve fire management strategies.

3.5.1 Management considerations and opportunities

Fire regimes comprising frequency, intensity and season of occurrence are influenced by both natural forces and human activities. **Inappropriate fire regimes**, related mainly to repeated fires at short intervals or fire at high intensities, can threaten the survival of some plants and animals and lead to changes in the composition and structure of plant communities. Consequently, **high-frequency fire** has been listed as a key threatening process under the BC Act and inappropriate fire regimes have been identified as a threat to a number of listed threatened plants, animals and ecological communities. Large and intense fires in the region are expected to continue to occur periodically and may increase in frequency under the influence of climate change.

Knowledge of appropriate fire regime thresholds for some native ecosystems and many threatened species in the parks remains limited, particularly in relation to fire intensity and season (e.g. the role of fire in maintaining winter-flowering plants for migratory birds such as threatened regent honeyeaters).

The **bushfires in 2019–20** were unprecedented in their extent and intensity. Immediately following these fires, the NSW Government released the *Wildlife and conservation bushfire*

recovery, immediate response January 2020 (DPIE 2020b) to support wildlife and conservation recovery. Efforts focused on mapping the extent of the fire damage, identifying at-risk species and communities, supplying emergency food, water and shelter to wildlife, controlling feral animals to reduce pressure on native wildlife, collecting and banking seeds, and supporting wildlife carers. A subsequent medium-term response plan was then developed to direct management for bushfire recovery (DPIE 2021b) and conservation assessments on plants, animals and ecological communities began to improve understanding of the impacts on wildlife and biodiversity (DPIE 2021c). Mapping and analysis to identify biodiversity impacts is continuing and a range of conservation actions have been identified to address impacts.

Eucalypts are highly fire adapted and are generally resilient to single fire events regardless of intensity. What is ecologically critical is the interval between fire events, the intensity of sequential fire events, and the climatic conditions post fire that help or hinder regeneration. One species, Camden woollybutt (also known as Paddy's river box), has been severely impacted in the Kanangra-Boyd National Park. Assessments are underway to determine the impact on blue gums in the Blue Gum Forest, the Camden white gum populations, and other species. Blue Mountains ash is also of concern, as unlike other eucalypts, it is killed by fire and is dependent on seedling regeneration for re-establishment (Lembit 2020). Repeat high-intensity fires, which occur before post-fire regrowth can mature to produce large volumes of viable seed, would be extremely detrimental to such species (Commonwealth of Australia 2020).

Fire can negatively affect **catchment values and water quality** by increasing the risk of erosion and sediment deposition in waterways, particularly if the fires are high to extreme in severity. Areas experiencing high to extreme severity fires show the greatest susceptibility to erosion, take the longest time to recover and have the greatest impact on animal species (Wilkinson et al. 2006; DEC 2007a; Cassar and Chafer 2007). There is potential long-term risk of water quality degradation caused by fire-induced landslides adjacent to water storage areas (Tomkins et al. 2004). Water yield is depressed after severe fire events, nutrient loads are often elevated and sedimentation rates greater compared with pre-fire levels (Wilkinson et al. 2006; Chafer 2007). Increased erosion and sediment movement may also impact speleotherms and water quality in cave systems.

NPWS has **fire management obligations** under the *Rural Fires Act 1997*, BC Act, NPW Act, and other associated legislation. Fire management in the parks is also subject to NPWS policies and any requirements of jointly managed special areas and the Gundungurra ILUA.

Fire management is a **cultural practice** that is integral to Aboriginal land management strategies to care for Country (Robinson et al. 2016). Aboriginal people's deep cultural knowledge about when different Country needs to be burned will contribute to evidence of the role of cultural fire management in biodiversity conservation (DPIE 2021b). Members of local Aboriginal communities are becoming actively involved in fire management, including reviving traditional fire management practices, or cultural burning, as part of park fire management programs.

Sites of importance to Aboriginal people can be damaged or even destroyed by bushfires (e.g. flaking of rock sites by heat, smoke residues in caves). There are undoubtedly many sites in the parks that are not currently known or documented and these sites cannot be protected during fires. NPWS needs to work with Aboriginal people to protect cultural heritage sites from fire and fire management activities, manage fire-affected sites and facilitate Aboriginal cultural fire management in the parks.

There are a number of **other assets** on park that may be threatened by fire, including historic heritage assets, walking tracks and other visitor infrastructure. Assets in areas adjoining the park are also at risk from fire. Fires burning under adverse weather conditions have the potential to spread from the parks onto neighbouring property (and vice versa) and

threaten assets. Fire can affect **visitor facilities and recreational opportunities** by damaging infrastructure and requiring park closures. Visitor access to the parks during and following fire must be managed to ensure visitor safety and protect burnt areas.

Fire can significantly affect **pest management** programs by promoting the spread of feral animals and weeds but can also create opportunities for improved control in some circumstances. Weed spread can be enhanced after fire through encouraging the germination of seed banks and the opening up of habitat to sunlight, although fire can also provide an improved opportunity to control weeds if sufficient resources are available. Pest management programs and activities need to be responsive to fire events, particularly where an advantage for control could be gained.

The large size and rugged terrain of the parks means that many **fires occur in remote areas**. Locating and responding to remote fires in the parks can be challenging due to the often steep, inaccessible terrain. Many management trails are situated along ridgelines, however, access into valleys may only be possible on foot, and in some areas access by foot may not be possible. For effective fire management in these parks, NPWS must maintain and enhance its capacity for remote firefighting.

Some aspects of **fire suppression practices** (e.g. the use of heavy plant or retardants) can potentially impact park values (e.g. sensitive plant and animal communities, karst surface features and caves, culturally important sites). Where temporary trails have been constructed in emergency situations where there is no prudent alternative (e.g. during wildfire control) these trails should be rehabilitated as soon as practical after the incident.

Community understanding of NPWS fire management practices and the responsibilities of individuals and households with respect to property protection should continue to be encouraged. Fire management is challenging due to the fire-prone nature of the parks, the range of park values, including World/National Heritage values, high visitation rates, extensive length of the urban-bushland interface, the position of villages and private property on exposed ridge tops, and the presence of major transport routes and other infrastructure (e.g. powerlines) dissecting the parks. When all these issues are taken into consideration, the optimum approach for managing fire can sometimes appear contradictory, which can lead to concern in the community about the appropriateness of NPWS fire management approach.

The parks' exceptional biodiversity and fire-prone nature means that they are of particular importance for **scientific research** to support fire management. Long-term, consistent and comprehensive records of all fires in the parks are crucial for fire planning, monitoring and research.

3.6 Climate change

Human-induced climate change is listed as a key threatening process under the BC Act (NSW Scientific Committee 2000) and habitat loss caused by human-induced greenhouse gas emissions is listed under the EPBC Act (TSSC 2001).

Climate change and fire have influenced the evolution of the distinctive and diverse plants and animals of the Greater Blue Mountains region for millions of years. However, in the future, many species and ecosystems may be exposed to conditions beyond those they are adapted to (Hammill and Tasker 2010).

Blue Mountains National Park and Kanangra-Boyd National Park planning considerations

The following is a snapshot of the predicted changes to climate for Metropolitan Sydney region which includes **Blue Mountains National Park** (adapted from Adapt NSW n.d., where 'near future' is 2020 to 2039 and 'far future' is 2060 to 2079):

- Average temperatures are projected to increase in the near future (i.e. 2020–2039) by 0.65°C.
- Average temperatures are projected to increase in the far future (i.e. 2060–2079) by 1.94°C.
- The number of hot days (i.e. >35°C) will increase by 3.9 days/year in the near future and 10.4 days/year in the far future.
- The number of cold nights (i.e. <2°C) will decrease by 4.5 days/year in the near future and 10.9 days/year in the far future.
- Rainfall is projected to increase in autumn in the near future, and will be variable across the region during the other seasons.
- In the far future rainfall will increase across the whole region in summer and autumn, while winter and spring rainfall will be more variable.
- Severe fire weather is projected to increase primarily in summer and spring.

For the Central West and Orana region which includes **Kanangra-Boyd National Park**, the predictions are:

- Average temperatures are projected to increase in the near future (i.e. 2020–2039) by 0.7°C.
- Average temperatures are projected to increase in the far future (i.e. 2060–2079) by 2.11°C.
- The number of hot days (i.e. >35°C) will increase by 9 days/year in the near future and 27 days/year in the far future.
- The number of cold nights (i.e. <2°C) will decrease by 7.7 days/year in the near future and 22.5 days/year in the far future.
- Rainfall is projected to decrease in summer, spring and winter in the near future.
- Rainfall is projected to increase in autumn.
- Severe fire weather is projected to increase primarily in summer and spring.

The potential impact of climate change on the parks is difficult to assess since it depends on the compounding effects of other pressures, however, there are anticipated impacts on fire regimes, soil erosion and run-off and on animal and plant species and their habitats.

The projected increases in temperature, number of hot days and severe fire weather days are likely to influence bushfire frequency and intensity and result in an earlier start to the bushfire season. Higher rainfall in summer and autumn are likely to accelerate all forms of soil erosion across the region and increase run-off at these times of year.

Climate change may change the size of populations and species distribution and alter the geographical extent and species composition of habitats and ecosystems. Species most at risk are those unable to migrate or adapt, particularly those with small population sizes, narrow ranges or slow growth rates. Pest species may also be advantaged by climate change (NSW Scientific Committee 2000), for example, a warmer climate would enable some weeds, such as lantana, to expand their distribution to higher altitudes (Commonwealth of Australia 2020).

3.6.1 Management considerations and opportunities

Responding to the potential threats from climate change, particularly the resulting altered fire regimes, will require a suite of approaches (see also Section 3.5.1). The continuation of programs to reduce the pressures arising from other threats, such as habitat fragmentation, invasive species and pollution, will also help reduce the severity of the effects of climate change.

Under conditions of climate change it will be important to continue to map patterns of fire and fire regimes and monitor the response of animals and plants to changes in fire regimes and climate. Continued analysis of these responses will allow us to detect change and manage impacts. It is also necessary to continually verify and improve fire frequency, intensity and seasonal thresholds and reflect any changes in fire management strategies.

4. Protecting our historic heritage

The Blue Mountains has a significant place in the history of European settlement in New South Wales. Europeans first successfully crossed the Blue Mountains in the early 1800s, and since that time the use and occupation of the area has reflected various themes, including exploration, rural settlement, pastoralism, agriculture, mining, timber harvesting, transport, water supply, conservation and recreation.

4.1 Historic heritage

The historic heritage and shared history (see Box 15) seen in the parks today includes historic precincts, tracks and structures, some of which are regarded as being of state significance. The Grose Valley, and the Blue Gum Forest in particular, is historically important for its association with the development of the early conservation movement in Australia.

Box 15: Shared history

Aboriginal people are known to have occupied mainland Australia for at least 65,000 years, and Australia has one of the oldest records of human existence on the planet. Many places today have particular significance to Aboriginal people. Other places are significant to Aboriginal and non-Aboriginal people, and the history of these places may be shared.

The shared history of the first Australians – Aboriginal people – and others since European settlement, is represented through our historic heritage which includes places and items that may have historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance.

History of the parks

The Greater Blue Mountains has a significant place in the post-contact history of New South Wales. They are part of the rugged sandstone semicircle which, for the first 25 years of European settlement in Australia, limited expansion of the colony and dissuaded convict escapes from Sydney and the Cumberland Plain. At the time, there was no pressing need for settlers to cross the mountains and they saw no reason to sanction official attempts to cross the mountains (Cunningham 1996). Nevertheless, several explorers did traverse parts of what is now the national parks, including Francis Barrallier who made substantial progress in 1802 into the area now declared as Kanangra-Boyd National Park.

In contrast to his predecessors, Governor Macquarie was amenable to the idea of expanding the settlement. In 1813 Blaxland, Wentworth and Lawson, with a local guide and convict servants, received permission to cross the mountains on horseback to find new grazing lands. Their route was much the same as that followed by today's Great Western Highway, which passes through Blue Mountains National Park. The Bells Line of Road, which also passes through the park, was formally established after Alexander Bell Jr was guided along the route by an Aboriginal person in 1823, at least as far as Mount Tomah (Macqueen 2022). These early expeditions signalled opportunities for the westward expansion and settlement of Australia's first penal colony. For Aboriginal people, they meant the beginning of great hardships and the loss of traditional land and lifestyle (C Tobin, Dharug man, pers. comm. 2011).

Blue Mountains National Park and Kanangra-Boyd National Park planning considerations

The opening up of the central west of New South Wales by the British led to the discovery of gold, coal, iron and copper. Various land-use themes subsequently emerged in the Blue Mountains, including pastoralism, transport, mining, timber harvesting, ethnic influences, migration, settlements and leisure.

Coal and shale mining took place across both parks from the 1860s, commencing in the Grose and Jamison valleys. In 1871, silver was discovered at Yerranderie (Heritage NSW 2022). Other mines in the southern Blue Mountains such as Ruby Creek (lead, silver and zinc) and Mount Werong (gold) also operated in the 19th century. The headwaters of the Abercrombie River still hold evidence of alluvial gold mining such as water races and diggings. The remains of mining activities in the parks include unique industrial heritage structures such as evidence of an aerial ropeway, used in 1885 in Wentworth Falls and later Katoomba, to transport shale mined at the Ruined Castle shale mine to the cliff top at Katoomba (near the present-day Scenic World).

After the opening of railway stations at Blackheath and Weatherboard (now Wentworth Falls) in 1867 to 1868, the Blue Mountains were more easily accessible from Sydney. Govetts Leap and Wentworth Falls became the first popular scenic lookouts in the Blue Mountains. By the 1870s, travellers passing through the Blue Mountains began to be replaced by visitors who stayed on to enjoy the natural environment (Low 1991). By the late 1880s many of the lookouts and walking tracks in the upper Blue Mountains had been constructed to cater to the burgeoning tourism industry, reflecting that the Blue Mountains had become an attraction in itself for its aesthetic and sensory appeal (Macqueen 2007). Around this time, the health benefits of the mountain air were also being promoted (Low 1991) and people had developed an appreciation of the restorative powers of nature. This became a significant driver in the emergence of the mountains as a destination for nature-based, outdoor recreation.

With the increase in visitors came the development of local nature conservation parks and a complex system of walking tracks and lookouts in the area. Bushwalking developed hand-in-hand with nature conservation in the area. In 1932, Myles Dunphy submitted a proposal for a Greater Blue Mountains National Park to the Surveyor-General and Blue Mountains Shire Council. At the same time, bushwalkers were using their own means to protect land that was to become known as the Blue Gum Forest in the Grose Valley. This background has led to Blue Gum Forest being known today as the ‘cradle of conservation’ (Macqueen 2007). In 1938, preparation for the construction of the Warragamba Dam began and resumption of land within the catchment over the following years assisted in the protection of these areas. It was not until 1959, however, that an area of 62,000 ha was dedicated as Blue Mountains National Park under the *Crown Lands Consolidation Act 1913* and later re-established under the *National Parks and Wildlife Act 1967*. Extensive additions were made to the park during the 1970s and 1980s, including some areas within the Warragamba catchment which are still jointly managed with WaterNSW. Myles Dunphy’s vision of a Greater Blue Mountains National Park was substantially realised in 2000, with the Greater Blue Mountains Area inscribed on the World Heritage List.

The first step towards the creation of the Kanangra-Boyd National Park occurred in 1891, when a reserve for public recreation was created at Kanangra Walls. Kanangra-Boyd National Park was first declared on 3 December 1969 under the *National Parks and Wildlife (Amendments) Act 1969*.

The bushwalking community has traditionally held commemorative events to mark major anniversaries of the Blue Mountains National Park’s reservation. Bushwalkers also traditionally hold a dawn Anzac Day ceremony at Splendour Rock in the Kanangra-Boyd Wilderness in Blue Mountains National Park. On 25 April 1948, Paddy Pallin and others from the Confederation of Bushwalking Clubs held the first Anzac Day service at Splendour Rock and a memorial plaque was dedicated, commemorating bushwalkers who fell in the Second

World War (Moppett 1948; Maxwell and Keats 2020). The plaque is now on the register of Australian war memorials (AWM 2023). Participants generally walk to the annual event, and then disperse in small parties associated with bushwalking clubs, consistent with the wilderness setting.

Heritage items

Section 170 of the Heritage Act requires each NSW Government agency to prepare and maintain a register of historic heritage items in their ownership or under their control. The NPWS register, known as the Historic Heritage Information Management System (HHIMS), includes 9 historic heritage complexes containing 131 items in Blue Mountains National Park and 2 items in Kanangra-Boyd National Park (HHIMS accessed 10 August 2022). The historic heritage items include houses and other buildings (see Table 2), tracks, staircases, lookouts, passes, roads, and remains associated with mining, rural settlement, pastoral use and timber harvesting.

The Blue Mountains Walking Tracks (a complex of 37 tracks) in Blue Mountains National Park are acknowledged to have particular significance and are listed on the State Heritage Register (see Box 16) (Heritage NSW 2022).

Box 16: Blue Mountains Walking Tracks – State Heritage Register

The State Heritage Register includes a complex of 37 walking tracks known as the Blue Mountains Walking Tracks. The tracks were developed over a period of 150 years, with some known to follow Aboriginal footpads, miners' and timber-getters' tracks, surveyors' routes, early roads and purpose-built recreational tracks (Smith et al. 2006). Many of the tracks reflect a high level of technical achievement to make accessible the seemingly inaccessible, while others have value in the social development of Australia. For example, the Federal Pass in Blue Mountains National Park was one of the first landscape features named to commemorate Australian Federation. Many tracks have been in continuous use since their construction in the late 1800s, and walkers have left a resource of written records, photographs and memoirs recording their impressions and emotional and spiritual experiences while on the tracks. In part, such recordings are significant as they document the changing relationship people have had with the landscapes of the Blue Mountains (Heritage NSW 2022).

The walking tracks in the parks continue to be a major part of the region's tourism infrastructure, receiving relatively high levels of use from large numbers of domestic and international visitors (Smith et al. 2006).

A conservation management plan (NPWS 2006b) guides the conservation, management and maintenance of the Blue Mountains Walking Tracks in the parks and some tracks within Crown reserves under the care of Blue Mountains City Council, Lithgow City Council and private lands.

The recorded historic heritage items in Kanangra-Boyd National Park include one of the Blue Mountains Walking Tracks and Dance Floor Cave, where a dance floor was installed under a large rock overhang at Kanangra Walls in 1891 and used for social events by local pastoralists.

In January 2009, the Sydney Catchment Authority transferred ownership of a number of historic buildings in Warragamba Special Area in Blue Mountains National Park to NPWS, including an historic slab hut in the Kedumba Valley known as Maxwell's Hut. In 2001 a heritage assessment and conservation management plan were prepared and endorsed for

Maxwell's Hut and the site was assessed as being of state significance (Edds and Associates 2001). Also transferred to the NPWS were the police station (assessed as being of state significance), courthouse (state significance), Roman Catholic church (St Senan's) (local significance) and Joe Deacon's House historic ruin (local significance) at Yerranderie East (also commonly known as Government Town) (Wilson 2000a,b,c; Rose Deco Planning & Design 2001). Other buildings associated with the Yerranderie settlement and the associated silver mining fields are located in the adjoining Yerranderie Regional Park.

A part of Carlon's Farm at Green Gully in the Megalong Valley was purchased by NPWS and gazetted as an addition to Blue Mountains National Park in 2003. Green Gully, including the old homestead structure (Carlon's House), has been identified as having local significance at an exceptional level (Otto Cserhalmi and Partners 2000). Green Gully also demonstrates a continuum of Aboriginal occupation and usage for thousands of years.

4.1.1 Management considerations and opportunities

In New South Wales, historic heritage values are protected and managed under the Heritage Act. NPWS manages places of historic heritage significance in parks in accordance with the Heritage Act, the NPW Act and the principles detailed in the Burra Charter. NPWS works closely with Heritage NSW in listing and protecting historic heritage values in the parks. Protection of these values is also prioritised in the NPWS Branch pest and weed management strategies and the parks' fire management strategies.

Many of the historic heritage items in the parks have not been formally assessed for significance and condition. **Assessment is required** before decisions are made about their future management.

In accordance with NPWS policy all items listed on the State Heritage Register will have a **conservation management plan** and be maintained in accordance with best practice management principles. Conservation management plans or a statement of heritage impact guide conservation and restoration works and any adaptive reuse of buildings or sites.

A conservation management plan has been prepared for the state heritage–listed **Blue Mountains Walking Tracks** (NPWS 2006b). Major works from the plan have been completed, including revitalisation of the Giant Stairway, National Pass, Grand Canyon and Princes Rock tracks, and works are continuing on other tracks.

At **Yerranderie**, Government Town (part of Blue Mountains National Park) and Private Town (part of Yerranderie Regional Park) are part of the Yerranderie Silver Mining Field and Settlement complex and should be managed as a contiguous historic heritage site. Although the site is not currently listed on the NSW State Heritage Register, it has been identified as being of state heritage significance (OEH 2013).

Conservation management plans were developed to guide the conservation and management of the Government Town buildings at Yerranderie East including the police station, courthouse, Roman Catholic church (St Senan's) and Joe Deacon's House (Helen Wilson 2000a,b,c; Rose Deco Planning & Design 2001). Given the time elapsed since their development, these plans may require review and update, and new approaches to management may be appropriate.

The main **threats to historic heritage** sites, places and items in the parks include natural events (e.g. fire and natural decay) and human use or impacts (e.g. vandalism).

The **adaptive reuse** (see Box 17) of historic heritage buildings can enhance conservation through refurbishment and restoration works, and provide funding for ongoing maintenance. New uses for buildings and places must be compatible with protecting their significance and enabling their history to be interpreted and shared. Opportunities also exist for the adaptive reuse of buildings that do not have historic heritage value (see Section 6). Maxwell's Hut in

the Kedumba Valley is being restored and adapted to provide accommodation for bushwalkers. Carlon's House at Green Gully is being managed as a ruin but there is potential for its history to be interpreted for park visitors.

Box 17: Adaptive reuse of historic heritage buildings

Many of our historic heritage buildings were built for a use that no longer exists today. If we want to conserve these buildings, viable new uses must be found to retain and sustain them. Redundant buildings are often vulnerable to neglect, decay and this may lead to eventual total loss. Often the best way to conserve a historic heritage building, structure or site is to use it. Adaptation or adaptive reuse offers new uses for old places. Examples in NPWS estate include visitor accommodation, food outlets and other visitor services. The new use needs to be compatible with the building, retain its historic character and conserve significant fabric, but it can still introduce new services, as well as modifications and additions (NSW Heritage Office 2008).

Table 2 Historic heritage buildings in the parks

Building	Location	Current use
Maxwell's Hut (also known as Kedumba Valley slab hut)	Kedumba Valley	None
Carlon's House ruins	Green Gully, Megalong Valley	None
Yerranderie police station and courthouse	Yerranderie East	NPWS use
St Senan's Church	Yerranderie East	Community use
Joe Deacon's House	Yerranderie East	Historic ruin

Some items of **moveable heritage** are located in the parks, NPWS offices and visitor centres, including items associated with the management and recreational use of the Blue Mountains National Park and items associated with the Yerranderie site. Care is required to store these items in appropriate condition and ensure they are appropriately documented and made available for presentation to the community. NPWS collections are recorded and catalogued on the NPWS Ehive Collections Management online database (link to database is provided in the 'More information' section).

Further opportunities exist to **interpret the heritage values** and acknowledge past use of the parks.

5. Providing for visitor use and enjoyment

Consistent with the NPW Act, NPWS aims to provide opportunities for sustainable visitor use and enjoyment that are compatible with the conservation of the parks' natural and cultural values. 'Sustainable' is within the meaning of the principles of ecologically sustainable development as defined by the *Protection of the Environment Administration Act 1991*.

In addition, the NSW Government, on behalf of the Australian people, is committed to identify, protect, conserve, present and transmit to future generations the OUV of the Greater Blue Mountains Area World Heritage property. NPWS works to ensure recreation and tourism in and around the property is ecologically sustainable and focussed on an understanding and transmission of the outstanding universal and other key values.

NPWS provides activities, attractions, facilities and tours in its parks and reserves to provide visitors the opportunity to enjoy and learn about parks. Often these are operated by NPWS but sometimes they can be managed more effectively, efficiently or flexibly by the private sector. In the Blue Mountains and Kanangra-Boyd national parks there is potential for NPWS to partner with Aboriginal joint managers, and commercial operators, to provide new visitor experiences and high-quality visitor information. NPWS is committed to providing park experiences that both support local communities and conserve our cultural and natural heritage.

Continuing to provide for sustainable visitor use and enjoyment of these parks involves enabling, planning and delivering:

- infrastructure and facilities appropriate to their setting
- adaptive reuse of existing buildings and structures
- commercial lease and licence arrangements for existing and appropriate new buildings and structures
- commercial tours and guided recreation activities including Aboriginal cultural tourism
- a range of recreation activities and access in line with relevant legislation including the NPW Regulation, Wilderness Act, Water NSW Regulation.

In addition to delivering opportunities consistent with the NPW Act, there are visitor safety, accommodation and events policies and a range of other activity and issue-specific NPWS policies that guide the provision of sustainable visitor use in the parks (see link to policies in the 'More information' section).

5.1 Visitor use of the parks

The parks have provided tourism and recreational experiences for generations of visitors since the 1870s and continue to play an important role in inspiring large numbers of people to experience and appreciate 'wild' places and places of natural outstanding universal value (IUCN).

The 2020 COVID-19 pandemic highlighted and reinforced that access to nature plays a vital role in human health, wellbeing and development. During travel restrictions associated with the pandemic, visitation to the parks increased, changed in origin, and temporal and spatial patterns. The connection between a healthy society and a healthy environment will increasingly underpin the role national parks play in creating social opportunities and enhancing the physical and emotional wellbeing of individuals and communities. Visitors are seeking authentic experiences that offer them opportunities to engage with nature and cultural heritage in a personal way.

Even before the pandemic, Blue Mountains National Park received over 8 million visits in 2018 making it the most visited national park in New South Wales (DPE 2023). The proximity of the parks to Sydney makes them important recreational retreats for a large and growing number of people. The population of Greater Sydney is projected to grow to over 8 million over the next 40 years and almost half of that population will reside west of Parramatta. The parks have been identified as playing a critical role in providing protected areas for the western part of the city, including Greater Penrith and Western Sydney Airport – Badgerys Creek Aerotropolis (Greater Sydney Commission 2021).

The parks also support a high level of recreational use from the resident population immediately surrounding the parks. The Blue Mountains is marketed as a 'city within a World Heritage national park', and many local residents routinely access the parks for a range of recreational pursuits. The parks are also enjoyed as a backdrop by the even larger number of visitors driving through the Blue Mountains between Sydney and western New South Wales.

Visitors to the parks represent a diverse cross-section of the community. In addition to the diversity of international visitors, within the population of Greater Western Sydney, around 35% of the 2.5 million residents were born overseas. Residents come from more than 170 countries and speak over 100 different languages. Greater Western Sydney is also the largest single Aboriginal community in Australia (Western Sydney University 2020).

Visitors to the parks enjoy a tremendous range of experiences, from a brief stop at a busy, iconic lookout to photograph the view, to multi-day, solo bushwalks in declared wilderness areas. By far the majority of recreation in the parks is concentrated around the edges. While this has implications for the sustainability of recreation at some of the more popular sites, it also creates a vivid juxtaposition of remote, 'wild country' experiences relatively close to areas of extremely high visitor use.

Understanding the nature and extent of visits to the parks is critical to managing recreational activity within them. Visitors to the region can be both locals and tourists (both domestic and international), and both day and overnight visitors. Comprehensive profiling of visitors has not been undertaken for both parks, however, visitor surveys conducted for Blue Mountains National Park suggest most visitors are residents of Greater Sydney, and range across all age groups (DEC 2005b).

Below are management considerations and opportunities related to visitor use in the Blue Mountains and Kanangra-Boyd national parks generally. Additional management considerations for particular visitor opportunities are addressed in the sections that follow.

5.1.1 Management considerations and opportunities

There is potential for **expansion of Aboriginal cultural tourism** in the parks. This is not only a business opportunity for Aboriginal communities but a vehicle to celebrate and share culture with non-Aboriginal people. The NSW Government is committed to the development of Aboriginal cultural tourism in a manner that Aboriginal people support and endorse, and that respects their cultural identity.

The *Greater Blue Mountains World Heritage Area strategic plan* (DECC 2009a, revision in prep. 2023) identifies **inappropriate recreation and tourism activities** as a major management challenge for the property, including the development of tourism infrastructure and commercial ventures, due to increasing visitor pressure.

The nature of **visitation and recreation is dynamic and changing**, as are visitor expectations. It will continue to be driven by influences such as global financial trends, global pandemics, social media, and emerging recreation activities and interest groups. This

creates both challenges and opportunities in the management of sustainable visitor opportunities in the parks. Management approaches will need to be adaptable and flexible.

Both parks are under increasing pressure from **increased visitation**. In some locations, levels of use are beyond the capacity of existing facilities, resulting in site degradation and impacts on park values, including wilderness, in addition to diminished visitor experiences.

Recreational use of the parks needs to be managed in a **regional/landscape context**, recognising the spectrum of opportunities available in the Blue Mountains generally and the cross-tenure nature of certain recreational experiences.

The terrain, changeable weather and variability in visitor experience and preparation levels can create significant **safety issues**. Innovative approaches that leverage existing technology can enhance visitor safety. Personal responsibility for safety and identification of known hazards and risks can be included in visitor safety messaging.

Adequate resources and technology are required to provide for and manage sustainable visitor opportunities in the parks. There are opportunities for **NPWS to partner with other recreation and tourism providers** to provide and mange visitor experiences.

There are opportunities for applying and promoting **relevant codes of practice** to maximise the sustainability of visitor activities in the parks. Such codes include those developed by NPWS and other NSW agencies and organisations, as well as codes developed by the Outdoor Council of Australia.

Limiting group sizes for recreational activities (commercial and non-commercial) is an effective tool for protecting natural and cultural heritage values, minimising impacts on other park users and maximising visitor safety. The NPW Regulation requires the consent of the NPWS for activities undertaken by groups of more than 40 people, but also allows for a plan of management to set alternative group size limits.

Research and monitoring of recreational use in the parks is important for adaptive management. This research and monitoring should include investigating the economic and social costs and benefits of recreational use of the parks, monitoring levels of visitation across the parks and across recreational activities, monitoring the impacts of visitation on park values (including identification of appropriate trigger points or indicators of unacceptable change), and monitoring visitor satisfaction and recreation trends.

5.2 Visitor access

The primary means of visitor access to the parks is private vehicle, although a number of popular visitor destinations and day walks in Blue Mountains National Park are accessible from public transport or are within walking distance from train stations and towns. The Great Western Highway and Bells Line of Road dissect the northern part of Blue Mountains National Park and, from these major roads, secondary routes provide high-grade, sealed road access to numerous park entry points. The Oberon-Colong Stock Route is the main access to Yerranderie and the southern area of Blue Mountains National Park, while access to Kanangra-Boyd National Park is primarily by Kanangra Walls Road. Park roads, many of them unsealed, provide public vehicle access to a range of visitor destinations in the parks, including walking tracks, day use and camping areas (see Figure 3).

A network of management trails provides access primarily for park management. These trails are generally not open for public vehicular use but, together with the network of walking tracks, they provide visitors with walking access to a range of destinations in the parks. Management trails outside the wilderness areas are also available to visitors for cycling and, in some locations, horse riding (see Sections 5.6 and 5.7).

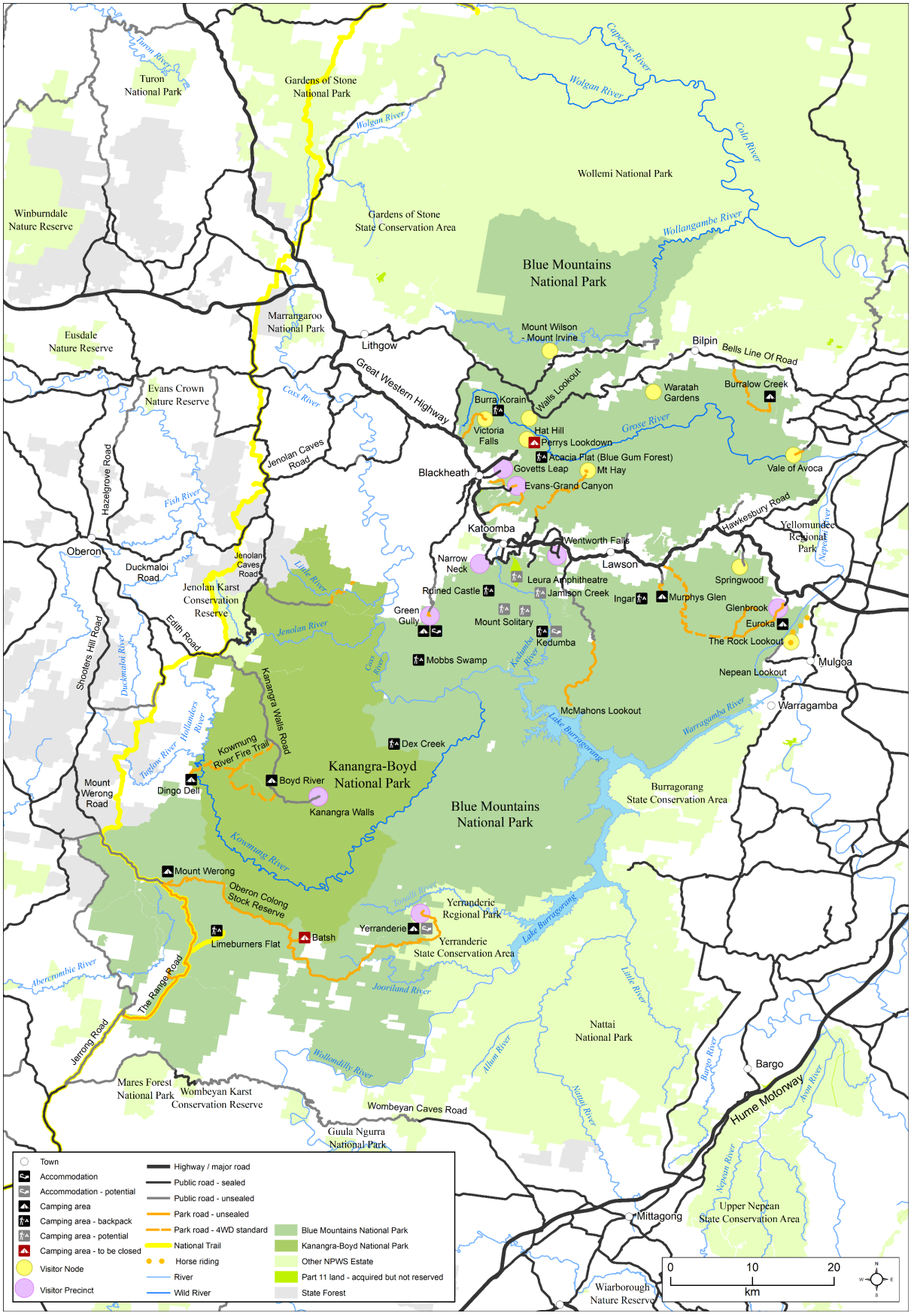

Figure 3 Visitor destinations and access

5.2.1 Management considerations and opportunities

In the parks, NPWS maintains a network of **publicly accessible roads** that cater for a variety of users and vehicle types. Some park roads and visitor destinations **require upgrading** to improve traffic flow, vehicle parking, public safety and user amenity, including the main car parks and roads along Mount Hay Road and Narrow Neck, from the park entry to the locked gate where the management trail starts (see Section 6.1).

Legal public access to some locations in the parks is complicated where roads traverse private property, or other land tenures (see Section 6.1.1).

The **off-road use of vehicles** can negatively impact natural and cultural heritage values (e.g. through loss of vegetation cover, soil compaction, erosion, acting as a vector for introduced plants, animals and pathogens), can damage park infrastructure and disrupt other park users.

Excessive speed on park roads increases the risk of personal injury, impact with wildlife and damage to assets. Where recreational vehicle use occurs on the same roads as other uses (e.g. cycling or horse riding), issues may arise with respect to visitor safety and visitor conflict.

Public access restrictions apply to the special areas and access is regulated by WaterNSW (see Section 1.3.3). Park visitors must refer to WaterNSW information for current access rules for various recreation activities, including bushwalking, cycling and horse riding in the special areas.

The concept of ‘wilderness’ from a visitor use perspective is about opportunities for solitude and self-recreation in the context of a populated and developed landscape. To achieve this type of experience, **visitor use must be regulated** to ensure wilderness protection and enjoyment of values while allowing activities that are consistent with those values (IUCN 2016). Limiting group sizes in wilderness is a tool to protect wilderness values and the experience of solitude and self-reliant recreation.

It may be necessary to close visitor access to parts of the parks, or for particular activities, during periods of bushfire risk, extreme weather events, or maintenance or improvement works.

Vehicles can be a vector in the introduction and spread of exotic plants, animals and pathogens in the parks. Measures to reduce these risks may be applied in the parks.

5.3 Visitor facilities

The parks contain a range of locations that are popular visitor destinations. Visitor facilities at these locations vary in accordance with their setting in the parks and the intensity of visitor use. See Figure 3.

Visitor precincts

Visitor precincts are characterised by high levels of visitor use (i.e. number of visitors, concentration and frequency of visits) and offer well-developed visitor facilities and infrastructure, consistent with their landscape setting. Visitor facilities vary in scale across the different precincts but may include formalised roads and car parking, lookouts, major track heads and signposted walking tracks, well-developed picnic and camping facilities. Visitor precincts provide for sustainable visitor services and facilities in a natural setting with high levels of recreation and social interaction. Visitor precincts include a number of destinations in Blue Mountains National Park and one location in Kanangra-Boyd National Park. A visitor centre is provided at Govetts Leap and a cafe/restaurant facility exists in the

Wentworth Falls precinct. There is potential for intensification of use at visitor precincts and it is likely there will be significant new infrastructure and improvements to existing facilities, commonly including upgrades to roads and car parking. Detailed descriptions of the precincts are provided below.

Glenbrook visitor precinct includes Euroka, Jelly Bean Pool, Blue Pool, The Ironbarks, The Oaks, Red Hands Cave, Nepean Lookout, Tunnel View and Mount Portal. Night-time access to the Glenbrook precinct is restricted via gate closures. The Euroka Camping Area is one of the most popular camping areas in the parks, providing a range of camping opportunities together with access to walking tracks, lookouts and the nearby Oaks Trail which is popular for mountain biking.

The **Wentworth Falls visitor precinct** includes Wentworth Falls Picnic Area, Valley of the Waters, the Conservation Hut and associated picnic facilities, lookouts and walking tracks.

The **Katoomba visitor precinct** includes Narrow Neck and the Three Sisters. Narrow Neck is a 10-km long peninsula that separates the Jamison Valley from the Megalong Valley and Wild Dog Mountains. It is an important access point for bushwalks in the park, including the remote 3-day hike between Katoomba and Kanangra. The peninsula is extremely popular with a range of recreational user groups and contains approved abseiling and climbing sites as well as opportunities for spectacular views, birdwatching, mountain biking and trail running. Public vehicle access is allowed from the park entry to the locked gate where the management trail starts.

The **Blackheath visitor precinct** includes Govetts Leap, Anvil Rock and Perrys Lookdown. Govetts Leap is a key visitor destination in the Blue Mountains National Park, accessed via sealed roads and only a short distance from the Great Western Highway and the township of Blackheath. From the lookout visitors can take in spectacular views over the scenic and significant Govetts Gorge, the upper Grose Valley and Grose Wilderness. Govetts Leap also forms the track head for a number of popular walking tracks, including Fairfax Heritage Walking Track, Govetts Leap Descent, Pulpit Walking Track, Rodriguez Pass Walking Track and Cliff Top Walking Track.

Evans-Grand Canyon visitor precinct includes the Evans Lookout and Point Pilcher.

The **Green Gully visitor precinct** includes Green Gully, the 2 Galong cabins and Dunphys Camping Area.

The **Yerranderie visitor precinct** in Blue Mountains National Park includes Government Town and the Government Town Camping Area. The remainder of the Yerranderie site (including Private Town) is in the adjoining Yerranderie Regional Park.

In Kanangra-Boyd National Park the **Kanangra Walls visitor precinct** includes the Kanangra Walls Lookout and Kanangra Walls Road.

Visitor nodes

Other popular visitor destinations, or visitor nodes, generally contain less-developed facilities. These visitor nodes include Springwood, The Rock Lookout, Vale of Avoca, Waratah Gardens, Mount Wilson-Mount Irvine, the Walls Lookout, Victoria Falls, Hat Hill, Mount Hay, Kedumba and a number of designated camping areas in the Blue Mountains National Park. These areas are generally experiencing increasing visitor use and may require infrastructure and visitor facility improvements, appropriate to their landscape setting, in order to manage changes in visitor use and frequency that will occur with the population growth of Greater Western Sydney and other demographic change.

Other visitor destinations

In addition to the visitor precincts and visitor nodes described above, there are a number of other visitor destinations in the parks, including day use areas, with low-moderate levels of visitor infrastructure, including lookouts, track heads, picnic facilities and visitor information.

5.3.1 Management considerations and opportunities

The parks' rugged, steep landscapes and the importance of protecting the significant natural and cultural values **limit opportunities for the expansion of existing visitor destinations** and the creation of new visitor destinations.

Due to the longstanding use of the parks for recreation and tourism, **some visitor infrastructure (including lookouts and walking tracks) is up to 100 years old** and may not meet current environmental protection, design and safety standards or may have relatively high maintenance costs. Assets that no longer meet visitor or park management needs may need to be removed, adapted, relocated or replaced.

Visitor precincts and visitor nodes require **upgrade works** to facilitate better visitor experience, manage increases in visitation, and protect World/National Heritage and park values.

Development of infrastructure and facilities in the parks' visitor precincts and visitor nodes is facilitated by site-scale planning. Visitor precinct planning considers the specific site conditions, including the landscape setting, cultural uses and visitor needs, to determine the selection and arrangement of infrastructure and facilities. Plans are finalised following environmental impact assessment and an appropriate level of public consultation depending on the scale and nature of proposed changes, community impacts and any legislative requirements. All improvements to visitor precincts and visitor nodes should consider feasible opportunities to improve inclusion and accessibility for park visitors.

Improvements have been undertaken in the **Govetts Leap** area in accordance with a visitor precinct plan and environmental impact assessment for the site. Further works are required to improve car parking and visitor access in the precinct.

Visitor facilities in the vicinity of **The Rock Lookout** (eastern Blue Mountains) require improvements to complement the adjoining Fernhill Regional Park and cater for increasing visitor use.

There are opportunities in the **Green Gully** precinct to improve day use and overnight stay facilities appropriate to the setting, and consistent with supporting walk-in access to the adjacent declared Kanangra-Boyd Wilderness. These opportunities include the adaptive reuse of existing buildings for visitor accommodation.

At **Narrow Neck** there is environmental decline associated with the high level of largely unregulated visitor use. Issues include the proliferation of informal vehicle tracks, parking areas and walking tracks, vehicles exceeding current parking capacity, increase in illegal camping and camp fires, competition for a limited number of abseiling sites, and a lack of toilet facilities.

Although the **Mount Hay Road** extends into the Grose Wilderness, the road occupies a corridor that is excluded from the wilderness area. Any improvements to Mount Hay Road, visitor access and parking must consider its wilderness location, including any visual impacts on wilderness values. There may be opportunities to move the car park to a less visually prominent location.

5.4 Camping and other accommodation

Provision of camping areas and facilities allows visitors to have a more in-depth experience of the natural and cultural values of a park. There is a well-established history of camping in Blue Mountains and Kanangra-Boyd national parks. Facilities of varying levels are currently provided at more than 15 camping areas in Blue Mountains National Park, and 3 in Kanangra-Boyd National Park (see Table 3 and Figure 3). Bush camping (i.e. camping outside of designated camping areas where facilities are not provided) also occurs at other locations in the parks.

Table 3 Camping areas in the parks

Camping area	Location	Type
Blue Mountains National Park		
Acacia Flat (Blue Gum Forest)	Grose Valley	Walk-in
Batsh[A,C]	Southern Blue Mountains	Vehicle-based
Burra Korain[B]	Mount Victoria	Walk-in
Burralow Creek	Bilpin	Vehicle-based
Dunphys	Megalong Valley	Vehicle-based
Euroka	Glenbrook	Vehicle-based
Ingar	Wentworth Falls	Walk-in
Kedumba[A]	Kedumba Valley	Walk-in
Limeburners Flat[A,D]	Southern Blue Mountains	Walk-in
Mobbs Swamp[B]	Megalong Valley	Walk-in
Mount Werong [D]	Southern Blue Mountains	Vehicle-based
Murphy's Glen	Woodford	Vehicle-based
Perrys Lookdown[C]	Blackheath	Vehicle-based
Ruined Castle[A]	Jamison Valley	Walk-in
Yerranderie – Government Town[A]	Yerranderie	Vehicle-based
Kanangra-Boyd National Park		
Boyd River	Kanangra Walls Road	Vehicle-based
Dex Creek[B]	Dex Creek	Walk-in
Dingo Dell	Kowmung River trail	Vehicle-based

A = camping area is within Schedule 2 land.

B = regularly used camping area within a wilderness area.

C = camping area proposed to be closed.

D = site is part of the National Trail.

The Black Range camping area, located at the northern end of Kanangra-Boyd National Park and adjacent to the Six Foot Track, is located on Crown land excluded from the park.

The Galong cabins at Green Gully in the Megalong Valley (2 renovated original cabins on the former Carlon's Farm) provide an alternative to staying at Dunphys Camping Area.

5.4.1 Management considerations and opportunities

The intent is generally to maintain the range and location of camping areas, however, there is **some scope to expand the range of camping experiences available**, thereby meeting some of the changing expectations of park visitors. There is an opportunity to establish new walk-in camping areas to support the Mount Solitary Walk (see Figure 4) and rationalise camping areas that are seeing environmental impact and/or have significant management issues. The proposal is to close the camping area at Perrys Lookdown and make it available for day use only, and to close the Batsh Camping Area. This will allow management to focus on the remaining camping areas.

Some of the established **camping areas are at or exceeding capacity**, and some are unsustainable or resulting in impacts on park values. For some there is limited opportunity for expansion without impacting on park values, while at others there are opportunities to upgrade or formalise facilities to respond to these increasing visitor numbers.

Opportunities for **bush camping** exist across the parks, however, some restrictions are required to protect park values.

Very few of the established camping areas in the parks are suitable for **car-based camping, camper trailers, caravans or camper vans**. While nearby parks (e.g. Wollemi National Park) and surrounding towns and villages provide for these type of camping experiences, there may be opportunities to expand capacity in existing vehicle-based camping areas to meet increased demand for camper trailer sites.

At some camping areas there is a need to **manage visitor numbers** and there are a range of tools that may be considered, including visitor education, group size limits and booking systems.

There are opportunities to expand the range of camping offerings available to include **serviced camping** (where tents and camping facilities and support services are provided) at some camping locations. There could also be opportunities for commercial leasing or licensing of serviced camping experiences. At some camping areas, serviced camping could be supported by the provision of **tent platforms or decks**, which could support semi-permanent tents and enable new, low-impact visitor accommodation experiences.

A cleared paddock area off Kanangra Walls Road, known as ‘Jensons’, provides an opportunity for **camping by large groups** who can be self-sufficient with toilet and other necessary facilities. This is not a designated camping area but provides opportunity to allow camping by consent.

There are 3 camping areas that are regularly used in the **wilderness areas**. These areas are located along well-established wilderness bushwalking routes. The challenge is to continue to **protect the wilderness experience** in a context of greater visitation. Bush camping and the use of wilderness camping areas can damage park values through inappropriate disposal of human waste and the gradual expansion of the footprint of the site.

The **National Trail**, which is used by walkers, cyclists and horse riders, traverses part of Blue Mountains National Park. There are opportunities for horse riders using the trail to camp, with their horses, at Mount Werong and Limeburners Flat. Limeburners Flat is within Schedule 2 lands so access by horses requires consent from WaterNSW.

With the vast extent of the parks and the large number of camping areas, new techniques and technologies are needed to **enhance regulatory and enforcement capability** (e.g. to monitor illegal or inappropriate activity such as vandalism and rubbish dumping).

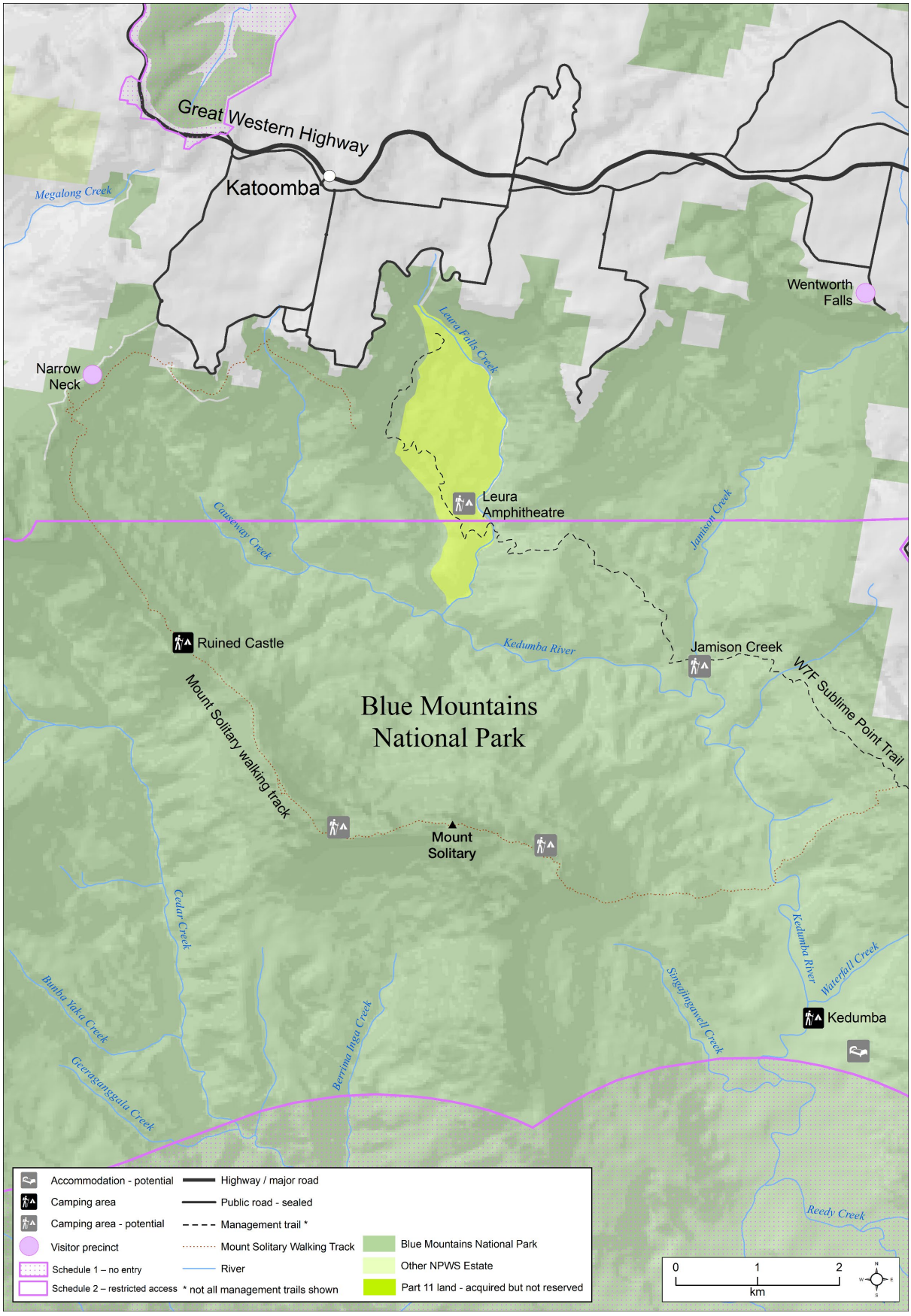

Figure 4 Detail of Mount Solitary walk and camping locations

Camp fires in some camping areas may be contributing to higher fire frequencies and increased risk to life and property. There are opportunities to declare 'Fuel stove only' areas (either on a permanent or seasonal basis) where, or at times when, wood fires or wood barbecues are regarded as having an unacceptable impact or pose a high fire risk. The collection of firewood for recreational camp fires in the parks has depleted the amount of deadwood and trees at some camping areas (e.g. in the Grose Valley and its rim).

There is a proliferation of **vehicles using roadside sites in the parks for camping**, either overnight or longer. Specific issues associated with this use include litter, the disposal of human waste and potential conflicts with other park users.

As the needs and preferences of park visitors evolve over time, the range of overnight stay opportunities in the park may need to be adjusted to include additional short stay visitor accommodation. **Adapting existing buildings** following environmental, heritage and sustainability assessment could provide new overnight experiences. There are several buildings in the park that have the potential to be adapted for use as visitor accommodation including Maxwell's Hut in the Kedumba Valley and the police station and courthouse in Yerranderie Government Town.

5.5 Bushwalking and trail running

Bushwalking brings visitors into close contact with the environment, providing opportunities for increased understanding and enjoyment of parks and the environment generally. Bushwalking in Blue Mountains National Park and Kanangra-Boyd National Park has both historic and contemporary significance. In many ways, the creation of the parks had its seed in the dedication of early bushwalkers to the region. Over the years, a vast network of bushwalking tracks has been established, with many still used today. World-class bushwalking opportunities exist within a range of settings and with varying degrees of social interaction, physical challenge, distance and self-reliance.

It has been estimated that over 30% of all visitors to Blue Mountains National Park participate in bushwalking, and its popularity is increasing (Mackay 2006). Based on NPWS track monitoring, an estimated 1.25 million people per annum use the walking track network (NPWS 2011). People undertake bushwalking to enjoy the scenery, for fitness, and to experience nature, although few will have prior bushwalking experience. Most bushwalkers (60%) using the parks of the Blue Mountains travel from Sydney, 20% come from the local area and 17% are international visitors. Significantly, more than 50% of these international visitors do not speak English (Mackay 2006). Trail running in the parks, using management trails and walking tracks, is also increasing in popularity.

There are over 145 km of walking tracks as well as unmarked, unconstructed multi-day bushwalking routes through wilderness and remote areas, including the Kanangra to Katoomba 3-day walking route, which links the 2 parks. The walking tracks are complemented by more than 100 lookouts. Walking tracks range from hard surface, all-access paths in visitor precincts to rough, steep and unmarked tracks suitable for experienced bushwalkers with specialised skills. Many of the walking tracks also have high historic heritage value and heritage restoration has been undertaken on a number of tracks in Blue Mountains National Park (NPWS 2006b). The tracks now support award-winning walks, providing all-weather opportunities for visitors and local people to experience the grandeur of the Blue Mountains. Many day walks in Blue Mountains National Park are also accessible by public transport, which is considered unique for a reserve of such size.

Visitor use data collected as part of the Blue Mountains Walking Track Project provides some quantitative evidence of how many visitors use particular walking tracks in each park. The Three Sisters Track (linking Echo Point to the Three Sisters) is one of the most popular tracks, receiving an estimated 350,000 walkers in 2011–12. Other high-use tracks include

Princes Rock, Queens Cascade and Prince Henry Clifftop. A much smaller number of people (around 10 to 1,200 per year in 2011–12) are estimated to walk the Kanangra Walls Track, the most popular walking track in Kanangra-Boyd National Park.

5.5.1 Management considerations and opportunities

The landscape and climate of the parks, combined with extremely high visitor numbers and great variability in the skills, experience and preparedness of users, create significant **safety considerations associated with bushwalking**. This has important implications for NPWS in relation to the maintenance of visitor infrastructure (e.g. tracks, lookouts and signage), and for NPWS and other organisations in relation to search and rescue operations.

Due to their longstanding use for bushwalking, the parks contain an extensive network of walking tracks, representing a wide range of construction methods and materials, track classifications and conditions. Walking tracks in the parks are of variable age and condition and many receive extremely high levels of use. Combined with the steep terrain and highly erodible sandstone soils, this means **maintaining the current walking track network is resource intensive**. The restoration of heritage walking tracks is particularly resource intensive. While a number of these tracks have been restored and upgraded, other tracks still require works.

As more resources may be required to manage and maintain walking tracks than are available, NPWS may need to consider **resourcing opportunities** and/or continually **revise the track network,** including designating tracks for maintenance, upgrade, new construction or revegetation/rehabilitation.

There is public interest in more ‘iconic’ walks or ‘signature’ **multi-day bushwalking experiences** in the parks. Crossing lands managed by NPWS and Blue Mountains City Council is a stunning 20-km walk, known as the Grand Cliff Top Walk, along the escarpment from Wentworth Falls to Katoomba. Other potential multi-day walking routes in the parks include the Mount Solitary Walk in Blue Mountains National Park.

There are opportunities to make **overnight walking experiences more accessible** to a broader range of visitors by providing facilities and support services for camping at appropriate locations.

As many **walking tracks in the parks cross tenure boundaries** (e.g. the Six Foot Track, the Grand Cliff Top Walk) there is a need for consistency and coordination between NPWS and other land managers in relation to information and interpretation, bush safety, track condition and track closures.

Well-known, multi-day walks that traverse the parks (e.g. Kanangra to Katoomba and Katoomba to Mittagong) pass through areas of declared wilderness where tracks are generally unconstructed and not signposted. These factors, combined with track braiding, can pose additional challenges for walkers. Search and rescue agencies have expressed concern about **potential safety issues for walkers**. Increased directional signage on its own may encourage visitors to attempt these walks without the appropriate skills and experience, so complementary actions are required to enhance visitor safety in these settings. Actions for consideration include vegetation management, track works and erosion control to minimise braiding and impacts on park values.

Bushwalking can impact park values through track braiding, changes in soil structure and inappropriate disposal of human waste and litter. There are opportunities to implement and promote relevant good practice guides to improve the sustainability of this activity.

There are opportunities to **improve the information and interpretive material** relating to bushwalking in the parks, in particular regarding:

- visitor safety, including information about the level of ability and preparation needed to undertake different walks, the terrain, and the changeable weather conditions in the Blue Mountains
- the kind of experience visitors can expect from different walks
- communicating the parks' values, particularly in relation to World/National Heritage, cultural heritage, wilderness and wild rivers.

Trail running is becoming increasingly popular in the parks, with runners often using popular bushwalking tracks. There can be conflict between these user groups. A code of practice for trail running, authorisation of events, group size limits and the management of access to tracks and trails (e.g. by location, days or times) may provide opportunities to reduce impacts and the potential for conflict between user groups.

5.6 Cycling

Cycling, including mountain biking, is a rapidly growing recreational activity in New South Wales. Consistent with the NPWS cycling strategy and policies, cycling is permitted on public roads and management trails in the parks, and on any designated and signposted tracks. Cycling and mountain biking are not permitted on walking tracks or off track. In accordance with WaterNSW access restrictions, cycling is not permitted in the special areas, except for 9-km length of track in the Woodford Special Area, which is open to cyclists and walkers. Restrictions apply to cycling in the declared wilderness areas, where cycling is only permitted on designated and signposted management trails.

The parks provide a range of opportunities for cycling, including mountain biking for beginners through to riders with intermediate skills. Popular management trails and public roads in Blue Mountains National Park include Glenrapheal Road, Narrow Neck Management Trail, Blue Gum Swamp complex of management trails (Winmalee), Ingar Road, Bedford Road, Bedford Creek Management Trail, Andersons Management Trail, Lawsons Ridge, Faulconbridge Point, Baltzers Lookout, Mount Hay Road and the Woodford-Oaks Trail. The Woodford-Oaks cycling route (via the Woodford-Oaks Management Trail and The Oaks single track) is recognised as one of the classic mountain bike rides in New South Wales and, uniquely, is accessible by public transport. The route is 28 km, some of which is shared with vehicles. The 21-km Boyd River Loop is promoted in Kanangra-Boyd National Park, making use of existing management trails on the Boyd Plateau.

Night rides and competitive cycling events also occur in the parks (e.g. using the Woodford-Oaks Trail). The National Trail (see also Section 5.7), which passes through south-western Blue Mountains National Park, is also available for cycling, as is part of the Six Foot Track (which traverses a public road in Kanangra-Boyd National Park).

There is a section (about 7 km) of designated cycle track on the Woodford-Oaks cycling route, which has been developed to separate cycling from other vehicle use.

Commercially guided cycling also occurs in the parks with commercial operators offering half-day, full-day and overnight guided rides, particularly on Narrow Neck Peninsula and Mount Hay Road in Blue Mountains National Park.

5.6.1 Management considerations and opportunities

Cycling, particularly mountain biking, is **growing in popularity** in the parks, attracting large numbers of participants relative to some other recreational activities. Anecdotal evidence suggests there is **growing demand** for the parks to cater for organised cycling events and to provide additional cycling trails and facilities, particularly to enable one-day rides close to urban areas. There is also evidence of demand for multi-day, longer distance and endurance

rides (cross-country riding), including the identification and promotion of one or more iconic rides which traverse landscapes representative of both parks.

Additional information is needed on cycling in the parks (e.g. profile of cyclists, levels of use, etc.) to facilitate future planning for appropriate, quality cycling experiences.

Inappropriate riding, or riding on poorly constructed and maintained trails, can **impact park values** (e.g. through erosion and vegetation damage). Other impacts associated with cycling include illegal trail development, off-trail riding, littering in remote parts of the park, and spreading weeds and pathogens.

Cycling on multi-use roads, trails and tracks (e.g. where cyclists share trails with walkers, motorists and/or horse riders) creates the **potential for user conflict** associated with enjoyment of the park experience, access and visitor safety.

Cross-tenure management of cycling trails requires ongoing, cooperative arrangements between NPWS and other agencies to ensure protection of park values and complementary management of cycling activities.

There is limited interpretive, promotional and minimum-impact material available in relation to cycling in the parks. The Outdoor Council of Australia has developed a voluntary ***Cycling, cycling touring and mountain biking good practice guide*** (Outdoor Council of Australia 2021) that details risk management and good practice for undertaking cycling activities with dependent participants.

5.7 Horse riding

Horse riding is a popular outdoor activity across peri-urban and rural areas in New South Wales. Many Australians associate horse riding with exploration, settlement and bush skills and enjoy riding in natural and bushland areas. Trail riding is a popular activity in areas surrounding the parks, such as the Megalong and Kanimbla valleys, and in other parks in the region including in the south-eastern parts of Wollemi National Park.

Horse riding in the Blue Mountains and Kanangra-Boyd national parks is permitted on public vehicle access routes (public and park roads) and other designated routes. **Designated routes** may be identified by notices at the relevant park entry points and on any relevant park maps. Horse riding is not permitted in wilderness areas.

Rileys Mountain Trail (a management trail in the Blue Mountains National Park, east of the Nepean River) is a designated route, as is the multi-use National Trail in southern Blue Mountains National Park. Horse riding is not permitted in declared wilderness areas and Schedule 1 lands and is only permitted on a small number of public roads in Schedule 2 lands.

Most of the horse riding in the parks occurs in the lower mountains area, due in part to its proximity to where horses are kept and riders reside, and the prohibition of horses from large parts of the parks because of wilderness and water catchment restrictions. Local riders generally transport their horses by horse float to take advantage of riding opportunities in the parks, while others travel from the semi-rural fringes of Sydney to ride individually or to take part in club activities.

A section of the multi-use National Trail (formerly known as the Bicentennial National Trail) runs through southern Blue Mountains National Park from Mount Werong to Taralga (via Jerrong Road, The Range Trail and Wombeyan Caves Road). This section is part of a 5,300-km continuous route developed in 1988 from Cooktown in Queensland to Healesville in Victoria along the Great Dividing Range of eastern Australia. It is available for non-motorised recreation such as walking, horse riding and cycling. The section of trail in the national park receives a low level of horse riding use.

5.7.1 Management considerations and opportunities

Management trails are utilised and maintained for NPWS management operations. They can be made available for horse riding when designated for this purpose. Rileys Mountain Trail is currently the only management trail where horse riding is permitted.

A number of management trails in the lower mountains area are popular for cycling and this use is generally incompatible with horse riding. A memorandum of understanding between NPWS and the Bicentennial National Trail Ltd sets out principles for management and use of the National Trail. There are opportunities for users of the trail to camp with horses at appropriate and limited locations in the parks.

There are **limited facilities** at park entry points to support horse riding (e.g. car parks of sufficient size for floats). To protect park values, it may be necessary to **close designated routes** on a seasonal, ongoing or temporary basis (e.g. after wet weather, fire or other incidents).

The NPWS ***Code of practice for horse riding in parks*** (OEH 2014b) supports horse riders to undertake this activity in a sustainable way in the parks. In addition, the Outdoor Council of Australia has developed a voluntary *Horse trail riding good practice guide* (Outdoor Council of Australia 2021) which details risk management and good practice for horse trail riding with dependent participants.

5.8 Caving

Caving in Kanangra-Boyd National Park occurs in Tuglow, Colong, Billys Creek, Moonshine Creek, Hollanders River and Church Creek caves. Recreational caving in the park attracts those with an interest in ‘wild’ caving (i.e. undeveloped caves with minimal or no infrastructure) compared to the more developed caving experiences (i.e. regular guided tours on prepared underground pathways in ‘show caves’) offered at nearby locations such as Jenolan and Wombeyan caves.

The small karst areas in Blue Mountains National Park (Limeburners Flat, Little Wombeyan Creek and Murruin Creek) currently attract little to no recreational use. They are in relatively pristine condition and as such are significant reference sites for scientific research.

Public entry to caves is regulated by a permit system, consistent with NPWS *Cave access policy*. Consents outline maximum group size, the level of experience required for guides and participants, and minimum requirements for first aid and safety equipment to be carried. The following management considerations and opportunities are recognised as being predominantly related to caving in the parks. Management considerations and opportunities identified as being common across adventure recreation activities (see Section 5.10) will also be also relevant to managing caving and should be read in conjunction with the following section.

5.8.1 Management considerations and opportunities

The Outdoor Council of Australia has developed a voluntary ***Caving good practice guide*** (Outdoor Council of Australia 2021) that details risk management and good practice for undertaking led caving with dependent participants. The Australian Speleological Federation, a peak body representing caving clubs in Australia, has also developed relevant policies for safe and sustainable cave access.

Visitor use of caves has the **potential to damage** unique formations and disturb cave-dependent fauna (notably bats) and can result in a proliferation of safety fixtures. The values

of some caves have not been assessed, increasing the potential for them to be accidentally damaged or destroyed by visitors.

The carrying capacity of caves to support visitor use is unknown and no formal monitoring is in place to **assess impacts and inform future management** of caving. There are opportunities, via the permit system and associated trip reports, to obtain information from cave users relevant to the management of cave systems. There is an opportunity to improve the **interpretation** of the values and management of caves.

5.9 Water-based activities

Generally, water flows in the parks are low and access to many rivers and creeks is difficult or involves walking varied distances from vehicle access points. However, some rivers in the parks, including the Kowmung, Cox and Grose rivers, provide opportunities for canoeing and kayaking, including white-water experiences (see Section 5.10) even at low water levels.

Some recreational fishing occurs in the parks, including at locations on Erskine Creek, Coxs River, Kowmung River and the Grose River. Other water-based activities occurring in the parks include swimming, liloing and limited opportunities for non-motorised boating or use of paddle-craft such as rafting, canoeing or kayaking.

Swimming is popular at many of the creeks, waterholes and dams across the parks. Liloing takes place in Blue Mountains National Park on the Wollangambe River (otherwise referred to as ‘canyoning’) and in Kanangra-Boyd National Park at accessible sites such as the Kowmung River crossing. In both parks this occurs in conjunction with canyoning and bushwalking.

5.9.1 Management considerations and opportunities

At popular access points to rivers and waterbodies there are opportunities to communicate **key safety messages** to help minimise visitor safety risks.

All **fishing** activities in New South Wales waters are regulated under the Fisheries Management Act.

The use of **paddle-craft on the rivers and other waterbodies** is subject to the *Marine Safety Act 1998* and the Marine Safety Regulation 2016; and the *Boating handbook* (Transport for NSW 2021) outlines the relevant rules and safety considerations. Lilos are categorised as floating equipment and as such, are declared not to be ‘vessels’ for the purposes of the Marine Safety Act.

Heavy rain and flooding events increase visitor hazards and can eventuate in unacceptable visitor risks and park or site closures.

5.10 Adventure recreation activities

The parks are important places for adventure recreation. ‘Adventure recreation activities’ in this context refers to recreational pursuits defined under the NPW Regulation as: ‘risking the safety of the person or the safety of other persons or damaging the environment’. NPWS policy refers to these specific pursuits as ‘risky recreational activities’. They are otherwise prohibited unless undertaken in accordance with a NPWS consent that is consistent with a plan of management or, the provisions in a plan of management for undertaking the activity in a park. A non-exhaustive list is in the Regulation, however, caving and cave diving are excluded.

In addition to the baseline duty of care to park visitors, NPWS has a specific duty of care in relation to risky recreational activities. Under the NPWS *Visitor safety policy*, park plans of management:

- help to manage risks to visitor safety by providing a consistent and systematic approach to classifying visitation patterns and determining an appropriate management response
- make specific detailed provisions for certain recreational activities to address their relevant risk and safety issues or to protect the environment.

The broken terrain of the parks provides extensive opportunities for adventure recreation activities which are based on particular topographic features. The parks are of national significance for vertical, roped activities of rock climbing, abseiling and canyoning. The related roped activity of slacklining is an emerging adventure pursuit in the parks.

5.10.1 Management considerations and opportunities

The landscape of the parks provides **many opportunities for adventure activities**. Specific adventure recreation activities are legitimate uses of the parks. The management of these activities will be directed toward the provision of appropriate nature-based adventure opportunities, the promotion of safety, the control of environmental impacts, the minimisation of visitor conflict and the protection of park values.

The NPW Regulation otherwise prohibits specific ('risky') recreation activities and pursuits in a park if the plan of management does not permit them. The Regulation enables plans of management to make provision for visitors to undertake risky recreational activities, including provisions that facilitate NPWS to grant consent for undertaking these activities.

The dispersed nature of the activities, combined with high numbers of participants, makes it neither practical nor feasible for NPWS to conduct regulatory patrols of non-commercial, adventure recreation activities. Rather, NPWS needs to rely upon **education, self-regulation and adherence to voluntary codes of conduct** to ensure the planning and provision of outdoor adventure activities meets best practice with respect to such considerations as minimum impact, risk assessment and safety.

The parks are not appropriate locations for the aerial adventure activities of bungy jumping, hang-gliding and parachuting. NPWS policy states that consent will not be given for base jumping in any park under any circumstances. The infrastructure required for high ropes courses, zip lining or flying fox and *via ferrata* has the potential to significantly impact park values.

Commercial adventure activities have been regulated in the parks to ensure visitor safety, protection of environmental values and to balance opportunities for commercial and non-commercial use.

Limiting group sizes for recreational activities (commercial and non-commercial) is an effective tool for protecting natural and cultural heritage values, minimising impacts on other park users and maximising visitor safety. The NPW Regulation requires the consent of the park authority (i.e. NPWS) for group sizes over 40 people, but also allows for a plan of management to set alternative group size limits. NPWS can also, on a case-by-case basis, issue permits for larger group activities. Key stakeholders have supported consistent group size limits set for both commercial and non-commercial groups with allowances for commercial guides and trainee guides.

The Outdoor Council of Australia (2021) has developed the ***Australian adventure activity standards***, the *Core good practice guide* and activity-specific good practice guides as a voluntary good-practice framework for safe and responsible planning and delivery of led outdoor adventure activities with dependent participants. They have been developed by

state and territory peak bodies and supported and funded by state and territory governments. These guides and codes facilitate better risk management and participant safety across Australian settings.

There are opportunities for NPWS to partner with industry and stakeholder groups to promote adherence to **industry standards and complementary codes of conduct** for individuals, organisations and leaders undertaking adventure recreation activities. Codes of conduct should ensure users are aware of relevant legal expectations and responsibilities, issues surrounding duty of care (both to the environment and others), and minimum requirements with respect to safety, risk management and emergency procedures. Codes of conduct should also articulate the situations under which particular actions associated with adventure activities may be inappropriate (e.g. placing fixtures in declared wilderness areas).

NPWS should continue to **collaborate with the outdoor adventure activity network** to ensure consistency in messaging about park values and usage across a range of channels, including printed and online publications. There is opportunity to develop a forum, or similar mechanism, to facilitate regular, continuing consultation with commercial and recreational user groups and peak bodies to discuss issues surrounding the management of adventure activities. Key issues include group sizes; environmental, cultural or visitor safety issues; the management of fixed protection; and developments in industry standards and codes of conduct.

While adventure recreation activities themselves are not necessarily detrimental to the environment, the growth in popularity of these activities and the high concentration of use at some sites has resulted in **some impacts to park values**, including impacts on threatened species, vegetation damage, erosion, track development, damage to rock features and cave contents, and disturbance of native animals.

Monitoring at key high-use sites for adventure activities is required. In particular, establishing and maintaining long-term monitoring of annual and seasonal levels of use and cumulative impacts will be useful to inform management.

The management of high-use adventure recreation activity sites is not consistent across sites. **Systematic site planning** is required to ensure consistent and transparent decision-making with respect to appropriate use, including justifying any temporary or permanent closures of routes or sites, and/or the removal of fixed protection or access infrastructure.

Many sites in the parks that are popular for adventure recreation activities are **within declared wilderness**. Localised high visitation and other outcomes of activities, such as the creation of informal foot pads and a proliferation of access infrastructure, are inconsistent with wilderness values and management.

Access infrastructure and fixed protection to manage fall risk have been installed over many years by park visitors. This includes, but is not restricted to metal bolts, rings, pins, chains, ladders, cables and other miscellaneous infrastructure. In excess of 10,000 such items are estimated to have been installed over the last 80 years in Blue Mountains National Park alone. Generally, fixed protection and other access infrastructure has not been engineered nor maintained since installation, raising concerns about the condition and reliability of such gear. It is neither reasonable nor possible for NPWS to carry out certification or maintenance of infrastructure placed by park users. Regulation or removal of all unauthorised infrastructure is also not feasible. There are opportunities for NPWS to collaborate with the adventure activity community to remove fixed protection where feasible or required to protect safety, aesthetics or other park values.

NPWS has installed fixed protection at 3 locations in the parks (Empress Falls, Grand Canyon and Mount Portal) and maintains responsibility for the condition of this infrastructure. It may be appropriate to consider additional locations for fixed protection in the future.

There is a range of opinions around the issue of **signage, particularly safety signage**, at adventure activity sites. While some feel that placing signs significantly alters the nature of the park experience and is unnecessary, others expect NPWS to fulfil its duty of care toward users by placing safety signs in the parks.

Rock climbing and abseiling

Rock climbing involves traversing up or across natural rock formations, while abseiling is any controlled descent down a rope. Abseiling is an activity in its own right but can take place in association with other activities that involve a steep descent. This includes rock climbing, canyoning, caving and remote bushwalking. NPWS acknowledges that rock climbing and abseiling are different activities, often undertaken in isolation of each other. However, because both require technical skill, physical capability and specialised equipment, both can have a similar environmental impact and as such their management is addressed together in this report.

Worldwide, rock climbing is a widely recognised and patronised adventure activity, and today Blue Mountains National Park has a profile as an international rock climbing destination. Rock climbing routes (i.e. the predefined path of individual climbs), can be classified into either ‘sport’ or ‘adventure’ routes. Sport routes are characterised by fixed protection including bolts and rings. These are usually placed by the first person to ascend a particular route. In comparison, adventure routes have little or no fixed protection. Adventure routes usually follow cracks or cliff features that allow climbers to place their own removable protection such as nuts, slings and camming devices. Sport routes are more intrusive as they involve modification of the natural environment.

Rock climbing as a sport appears to have commenced in the Blue Mountains from the late 1920s. A rock climbing club, the Blue Mountaineers, was formed in 1929 and in 1932 they undertook a rock climbing demonstration at the opening of the Giant Stairway on the Three Sisters (Meadows 2013). Early in the 1950s, routes started to be recorded including classic routes such as The Mantle Shelf and West Wall on the Three Sisters, and Malaita Point. The park now has hundreds of documented routes, many of which have been in use since and even before the national park was gazetted. Participation in rock climbing is estimated to be equivalent to 60,000 person days per year, with the well-established local climbing community of the Blue Mountains further contributing to the relatively high-use levels.

Popular climbing sites (i.e. locations with numerous identified climbing routes) in Blue Mountains National Park include:

- Megalong Valley, including Narrow Neck West and Rhum Dhu
- Jamison Valley, including Kedumba Walls, Kings Tableland, Sublime Point, Honeymoon Bridge to Katoomba Falls, Landslide, Narrow Neck East and Malaita Point
- Bowens Creek
- Grose Valley, including Ikara Ridge, Victoria Falls, Lockleys Pylon, Fortress Ridge, Mount Hay, Banks Wall, Hanging Rock, Bald Head, Pulpit Rock, Carne Wall, Walls Lookout, Pierces Pass, Perrys Lookdown, Asgard Head and Thor Head.

There are also many other routes along most major cliff lines. Comparatively little rock climbing occurs in Kanangra-Boyd National Park.

Abseiling is undertaken in both parks, often in association with canyoning, caving or rock climbing. Abseiling also occurs as a standalone activity on many accessible cliffs throughout the parks. Major sites include Narrow Neck, Malaita Point and at Mount Portal.

Commercial adventure companies offer climbing and abseiling instruction and guiding in the parks. Their main instruction site is near the pumping station on Narrow Neck Peninsula in

Blue Mountains National Park. The following management considerations and opportunities are predominantly related to rock climbing and abseiling in the parks. Management considerations and opportunities common across adventure recreation activities (see Section 5.10.1) will also be relevant to managing rock climbing and abseiling.

Management considerations and opportunities

- The gazettal of the **Three Sisters as an Aboriginal place** (in 2014) helps conserve the site's special significance with respect to Aboriginal culture. Rock climbing and abseiling at the site on this basis is not appropriate. The west face of the Three Sisters was once a popular climbing and abseiling route before it was temporarily closed to rock climbing in the 2000s to mitigate against ecological damage and to protect the aesthetic integrity of an internationally recognised natural icon and tourist attraction.
- Some sites in the parks are very popular for climbing and abseiling, leading to **occasional congestion with associated impacts on visitor safety and enjoyment**. Particular pressure points in Blue Mountains National Park include Narrow Neck Peninsula (including the learner abseil site adjacent to the pumping station road), Sublime Point and some locations in the Grose Valley. At some locations there is a proliferation of new rock climbing infrastructure.
- The Australian Climbing Association (New South Wales), formed in 2019, is the peak body for recreational rock climbing in New South Wales. The Outdoor Council of Australia has developed a **voluntary *Abseiling and climbing good practice guide*** (Outdoor Council of Australia 2021) that details risk management and good practice for undertaking rock climbing and abseiling with dependent participants.
- While most rock climbing and abseiling in the parks occurs on sandstone and ironstone, it should be noted that limestone cliffs and their associated ecology within karst areas are easily **damaged by rock climbing and activities**. Nesting birds (e.g. falcons and owls) can also be disturbed by these activities.

Canyoning

Canyoning is an adventure activity that can combine bushwalking, wading, swimming, jumping, boulder hopping, scrambling, rock climbing or abseiling to travel through a canyon. A canyon is a deep ravine between cliffs, often carved from the landscape by a river. Most canyons are formed by a lengthy process of erosion from a plateau level. In Blue Mountains National Park, the canyons mostly comprise creeks and relatively small, narrow gorges, referred to as 'slot' canyons. Canyons in Kanangra-Boyd National Park are more often larger, 'drop' or waterfall canyons.

The Blue Mountains is recognised internationally as a canyoning destination. The first Australian canyon guide listing Blue Mountains canyons was published in 1964 (Jamieson 1964). The latest version lists approximately 50 known canyons in Blue Mountains National Park and 13 in Kanangra-Boyd National Park. Popular sites in Blue Mountains National Park include Empress Falls, Grand Canyon, Claustral, Wollangambe, Butterbox and Serendipity. Popular sites in Kanangra-Boyd National Park include Kalang and Kanangra Main. Commercially operated, guided canyoning is offered in both parks, although the majority of activity occurs in Blue Mountains National Park. Over 4,500 people are estimated to participate in commercial canyoning trips annually, with peak numbers typically occurring between November and March. It is difficult to accurately quantify the number of non-commercial canyon trips occurring in the parks, although it is estimated to be up to 50,000 people each year.

The following management considerations and opportunities are recognised as being predominantly related to canyoning in the parks. Management considerations and

opportunities identified as being common across adventure recreation activities (see Section 5.10.1) will also be relevant to managing canyoning and should be read in conjunction with the following section.

Management considerations and opportunities

The **number of users** at particular canyons has increased significantly over recent years. Popular canyons (e.g. Empress Falls, Grand Canyon, Claustral) can experience congestion, leading to user conflict and significant impacts on visitor enjoyment and safety. Both commercial and non-commercial groups have an interest in avoiding congested canyons and having access to a booking system for the popular canyons.

Different canyons in the parks carry with them different, **site-specific risks** and so have particular requirements concerning signage, early weather alert notification, visitor safety when accessing and exiting the canyon, and safe options for car parking.

At some sites, **informal footpads** have emerged as access routes to canyons, causing erosion, damage to vegetation and diminishing other park values.

Heavy rain and flooding events increase visitor hazards and risk in canyons that can eventuate in unacceptable visitor risks and park or site closures.

The Outdoor Council of Australia has developed a voluntary ***Canyoning good practice guide*** (Outdoor Council of Australia 2021) that details risk management and good practice for undertaking canyoning with dependent participants.

A **booking system for commercial operator use of canyons** has been employed by NPWS to help relieve congestion, maximise visitor safety and reduce environmental impact. Opportunities may also exist for better managing non-commercial use of popular canyons, including online bookings, user registration or some form of licensing or consent system.

There are opportunities to collaborate with the Roads and Maritime Services and peak user groups to improve parking and safe access to key canyoning tracks off the Bells Line of Road.

Slacklining

Slacklining is a by-product of Yosemite National Park's rock climbing scene in the mid-to-late 1970s. It has established popularity in the United States of America, Canada, Europe, United Kingdom, parts of the Middle East, Asia and South America, former Soviet countries and Australia. The grassroots International Slackline Association (ISA) was established in 2015. The Australian Slacklining Association is an active member of the ISA and is the peak national representative body for slacklining.

Slacklining requires skills and equipment that are also required for rock climbing and abseiling. Basic slacklines are generally: 5 to 10 m long, but can be up to 30 m; 50 mm wide webbing, tensioned with a ratchet; around 50 to 90 cm height from ground; and reliant on anchors such as trees, climbing bolts or A-frames.

Variations of slacklining include highlining, longlining, yogalining, waterlining and tricklining. Highlining involves slacklining at height and in airspace between cliff features, with participants wearing a climbing harness and using a line transportation device, a lanyard/sling, carabiners and a prussik.

Management considerations and opportunities

There may be opportunities to accommodate basic slacklining in designated camping areas (outside of wilderness) and day use areas where the activity avoids using built visitor

facilities and blocking public access thoroughfares. Participants would need to undertake the activity in a way that minimises conflict with other park visitors.

In regard to highlining, **potential activity hazards, risks and issues** that have been identified include participant and aviation safety, visual impact on the scenic/landscape values of the parks, impacts on ecologically sensitive sites and noise pollution.

Consideration of relevant **activity conditions to ensure visitor safety** in the parks include permitted period of use of slackline webbing, safety protocols, and emphasis on participants self-regulating and adhering to the Australian Slacklining Association's code of conduct, including appropriate skills, experience and equipment.

The Outdoor Council of Australia has developed a voluntary ***Challenge courses good practice guide*** (Outdoor Council of Australia 2021) that details risk management and good practice for undertaking slacklining with dependent participants.

White-water paddling

Generally, water flows in the parks are low and access to many rivers, creeks and other waterbodies is difficult or involves significant walk-in distance from vehicle access points. However, some rivers in the parks, including the Kowmung, Cox and Grose rivers, provide opportunities for canoeing and kayaking, including white-water experiences even at low water levels. Other waterways, including the Glenbrook Creek, offer easy access to launching points but may be dangerous during flood events, presenting significant hazards and risks for park visitors.

5.11 Future recreational activities

Future proposed recreational activities that are not provided for, or expressly ruled out by the plan of management, should be considered within the existing planning framework of:

- the provisions of the NPW Act and the NPW Regulation
- the Wilderness Act any other relevant Acts
- that recreation and tourism in and around the Greater Blue Mountains Area World Heritage property is ecologically sustainable and focussed on an understanding and transmission of the outstanding universal and other key values
- the management objectives and intent of the plan of management
- level of impact on the park values, other existing permitted recreational uses and operational considerations.

5.12 Events, functions and other group activities

There is a diverse range of **group activities, events and functions** that occur in the parks, from ultramarathon running events and commercial adventure recreation tours, to school Duke of Edinburgh expeditions and military training.

Under the NPW Regulation, consent from NPWS is required for the following to be organised, conducted, attended or participated in:

- organised sporting activity, competitions or tournaments
- concerts, public meetings, functions, demonstrations involving more than 40 people or as otherwise stated in a plan of management
- any other group activities or gatherings involving more than 40 people or as otherwise stated in a plan of management

- manoeuvres (whether military, naval, aerial or otherwise)
- any course of training or any similar activity.

Group size limits are a tool for managing visitor safety and experience and impacts on park values. Group size limits are considered separately for specific recreational activities and may vary between activities. Limits for adventure recreation activities will generally be below the limits established by the NPW Regulation and will be detailed in the plan of management. Group sizes above the limits established in a plan of management may be approved by consent or licence, and may be considered appropriate for particular activities or locations.

An **event** is an organised group activity open to the general public and involving the use of land within the parks. Events can include competitive or non-competitive sporting and recreational activities, educational activities, cultural activities, Aboriginal cultural activities, conferences, concerts, public meetings or demonstrations. Events can be run for commercial, non-commercial or not-for-profit purposes and can take place over a single day or multiple days.

By contrast, **functions** are regarded as organised group activities that are not open to the general public (e.g. a private wedding) but still involve the use of public land within the parks. Events and functions are generally permissible in national park estate, although are not considered compatible with the principles of wilderness and so are generally not permitted in areas of declared wilderness. All events and functions require a consent, issued under the NPW Regulation, and may also require a lease or licence issued under the NPW Act.

Commercial tours, guided recreation activities or courses of training are generally managed by the Parks Eco Pass program (see Section 5.13).

5.12.1 Management considerations and opportunities

There is an increasing demand, particularly in Blue Mountains National Park, for large-scale **competitive sporting events**. Such events can result in increased, positive exposure for the park and can bring economic and social benefits to local communities and to organisations running the events (many of which are not-for-profit). Many events also attract large numbers of spectators and support crew, leading to even greater numbers in the parks.

Competitive sporting events can cause unacceptable impacts on natural and cultural values due to the high levels of concentrated use at particular sites and on particular trails and tracks. Competitive sporting events can also create conflict with other recreational users, due to issues of crowding, noise and competition for the use of park facilities.

There is evidence of growing demand for use of declared wilderness areas for competitive sporting events, however, this activity is not considered consistent with the management principles for declared wilderness.

Where **military manoeuvres or training**, and other courses of training, involve wilderness areas and/or specific recreation activities, NPWS policies provide guidance for the consideration of group sizes particularly if:

- the maintenance of wilderness values can be maintained (e.g. activity is outside peak visitation periods)
- trainer to trainee ratios as set by the organisations cannot be adjusted to meet group size limits (set by the plan of management) and the content of the course of training is directly relevant to the training location in the parks (e.g. wilderness navigation or canyon guide training).

5.13 Commercial activities

NPWS is committed to providing activities, attractions, facilities and tours in its parks and reserves to provide opportunities for visitors to enjoy and learn about the parks. These are often operated by NPWS, but sometimes there are opportunities for NPWS and the private sector to work together to deliver quality and innovative services to the public. Commercial operators who are fully invested in NSW parks will help protect these valuable places for future generations to enjoy.

Recreation and education activities run by commercial operators currently include canyoning, rock climbing, abseiling, cycling and guided bushwalks, including overnight walks, together with educational activities for schools (e.g. Duke of Edinburgh Award activities) and cultural heritage tours and programs. Collaborating and working effectively with commercial tour operators is mutually beneficial for NPWS, park visitors and the commercial tour operators.

In 2011, there were 66 commercial tour licences issued for the Blue Mountains region. Of these, 62 were for activities in Blue Mountains National Park, and 22 were for Kanangra-Boyd National Park. In 2011, over 56,000 people took part in commercial tourist activities in Blue Mountains National Park, representing 43% of all licences granted, and generating 49% of all revenue raised from commercial activities in New South Wales national parks for that year. Commercial tourism in the parks is of great economic importance to the Blue Mountains region.

The Parks Eco Pass program provides a centralised approach to licensing commercial tour operators to conduct tours and activities in all NSW national parks and reserves. The program is focused on ensuring operators deliver high-quality and sustainable visitor experiences that prevent harm to natural areas.

The parks offer spectacular landscapes and locations that are attractive for filming and photography. The *Filming Approval Act 2004* makes filming permissible even if it's otherwise prohibited under national parks legislation.

5.13.1 Management considerations and opportunities

Any **commercial activity** in a park must be permissible under the NPW Act and compatible with the plan of management. Commercial activities in a park require an agreement, generally in the form of a **lease or a licence**. These agreements ensure that activities, levels of use and behaviour are appropriate for the park and specific locations and are compatible with general recreational use.

There is potential for commercial operators to provide **support services for overnight walks and camping** at some locations, including the provision of safari-style tents erected on camping decks or platforms at designated sites and associated management services for visitors.

Commercial activities in **special areas** require access approved by the regulatory authority, WaterNSW. There is opportunity for commercial activities to be undertaken in **wilderness areas** providing they are consistent with any conditions outlined in the plan of management that protect wilderness values.

Demand for commercial licences is likely to increase and/or change in the future contingent on changing visitor needs. Because of the innovative and ever-changing nature of the nature-based recreation industry, it is expected that NPWS will receive future proposals for new licensed activities that may not be expressly provided for in the plan of management and will need to have permissibility assessed before licence approval.

Filming and photography is managed according to NPWS policy and the approval processes applied seek to protect the conservation values of the parks. The policy does not apply to the taking of amateur films and photographs for non-commercial purposes, where the purpose for capturing the material is primarily for hobby or personal interest.

5.14 Information, interpretation and education

Promoting public awareness of park values, recreational opportunities and NPWS conservation responsibilities assists in encouraging visitors to appreciate and support protection of national parks while also increasing their enjoyment of these landscapes.

The World Heritage Convention creates an obligation for World Heritage property managers to provide information, education, interpretation, promotion and publicity for the Greater Blue Mountains Area in a way that creates a greater understanding of, and support for its Outstanding Universal Value and the World Heritage concept.

The educational value of the parks is outstanding, and numerous organised education activities currently take place in the parks. Both parks lend themselves to programs focused on particular environmental messages, such as the preservation of threatened species and ecological communities and the impacts of human activities on natural and cultural values. The parks contribute to increasing public awareness about the environmental and cultural values of natural landscapes and specific issues such as fire and climate change. The parks also support a diverse program of Aboriginal cultural education activities, providing Aboriginal people with an opportunity to share, as appropriate, cultural heritage with the wider community through talks and tours conducted on Country.

Educational activities undertaken in the parks include interpretive bushwalks (with themes such as birds, wildflowers, nocturnal wildlife and historic heritage) and cultural heritage talks and tours. In addition, universal access educational opportunities are provided on the Fairfax Heritage Track in Blue Mountains National Park. The parks offer formal outdoor learning opportunities for primary, secondary and higher education students and the general public. NPWS programs (including the Discovery program) offer a range of activities in the parks, providing interpretation of natural and cultural heritage through walks, talks and tours, particularly during peak holiday periods. In addition, the parks form a significant part of several outdoor education programs, with numerous recreational and technical skills courses and training exercises routinely conducted on-park by schools, TAFE NSW, universities and private operators. Key locations for educational activities include Euroka, Wentworth Falls, Three Sisters, Katoomba Falls, Blue Mountains Heritage Centre at Blackheath, Grand Canyon, the Megalong and Grose valleys and Kanangra Walls. Commercial tour operators licensed under the Parks Eco Pass program also deliver environmental education activities in the park.

An NPWS visitor information centre operates at Govetts Leap and information and interpretive signs are located at major visitor destinations in the parks.

5.14.1 Management considerations and opportunities

A priority for park information is **visitor safety messaging**. On-site signs identify site-specific risks and provide information on how to avoid risks and what to do in case of an emergency. Safety information, and the delivery methods, must be regularly reviewed as part of the parks' risk management program to ensure essential safety messages are communicated and appropriate treatments are in place.

There is opportunity to **improve interpretation and directional signage** when sites and facilities are upgraded, and opportunities exist to improve interpretation of the parks' values

through a range of other media including app-based and web-based technology, guided activities, displays, signs and printed material.

The parks could expand on **opportunities for larger educational activities**, such as overnight camps (e.g. Scouts or Girl Guides groups).

It is likely that the **educational value of the parks** will be more widely recognised in the future due to the unique opportunities offered by their size and relatively natural state, coupled with the growing needs for school and university environmental education.

5.15 Research

The parks have unique value for research and contain vital subject matter, enabling ongoing discovery across a range of disciplines, including biology, archaeology, geology, karst science, tourism and social sciences. As part of the largest and most continuous area of protected bushland in New South Wales, the parks are natural laboratories that have particular value for understanding the influence of landscape-scale processes such as climate change, fire, weeds and pests. Both parks also provide valuable opportunities for the study of wilderness as a benchmark against which environmental changes in more modified landscapes can be better understood. Research undertaken in the parks also supplements research being undertaken on a broader scale in New South Wales under biodiversity strategies and further afield at interstate and national levels.

The results of scientific research conducted across the Greater Blue Mountains were able to support the original World Heritage nomination. The current state of knowledge about the property's OUV is dependent on prior and ongoing research.

Facilitating increased levels of scientific research is directly related to the obligations under the World Heritage Convention to encourage scientific research into the identification, conservation and rehabilitation of the OUV of the property, as well as fostering best management practice and abatement of threatening processes.

Some research is undertaken by NPWS, however, much is conducted by universities or other research institutions, usually in partnership with NPWS. NPWS has successfully coordinated a number of one-day research forums to bring researchers and park managers in the Blue Mountains together to share the latest research findings and priorities for on-ground park management.

5.15.1 Management considerations and opportunities

The **outcomes of research and monitoring** provide valuable information to improve NPWS's understanding of park values and implement adaptive management.

There is opportunity to **improve the planning and coordination of research** in the parks to ensure the limited funding available is put toward projects with the greatest potential to benefit the conservation and management of park values.

Research **results need to be made more accessible to park managers**, stakeholders and the broader community in order to enhance the implementation of research findings and garner understanding and support for future research projects.

Consideration must continue to be given to the **potential for certain research to impact** natural and cultural values.

NPWS consent is required for research activities in the parks, and in the special areas the consent of WaterNSW is also required. Collaboration with the relevant Aboriginal people and/or community is required for any research into Aboriginal cultural values.

Blue Mountains National Park and Kanangra-Boyd National Park planning considerations

The NPWS **ecological health monitoring framework** and program provides a basis for a research and monitoring strategy to prioritise and allocate resources for monitoring programs across the parks.

6. Park infrastructure and services

6.1 Infrastructure in the parks

A range of infrastructure is required in the parks in order to protect park values, provide opportunities for visitors and to facilitate management operations. This infrastructure includes roads and management trails, car parks, walking tracks and lookouts, water and sewage mains, buildings and other visitor facilities, helicopter and aircraft landing facilities, works depots and associated storage.

These facilities are managed and maintained through the NPWS Asset Management System. This system helps NPWS maintain and renew assets necessary to support safe and sustainable visitor use, park management operations and enhance heritage conservation.

Assets no longer necessary for park management or visitor use may be decommissioned or removed and the site rehabilitated after relevant heritage and environmental impact assessments and approvals.

Park roads and access

Public roads provide access to key entry points for the parks and a number of locations in the parks. In addition to these public roads, over 140 km of sealed and unsealed park roads (maintained by NPWS) provide public vehicle access to key destinations in the parks (Figure 3).

Definitions of roads, trails and tracks

Where these terms are used in this report and the associated plan of management, they have the following meaning:

- **Public road:** Includes off-park public roads (i.e. roads managed by other agencies) and park roads (i.e. roads reserved as part of the park and managed by NPWS) that are available for public vehicle use. Park roads are also available for cycling and walking and may be available for horse riding. Park roads may be sealed or unsealed.
- **Management trail:** A vehicle trail in a park that is maintained to facilitate park management activities. Management trails can be used by visitors for walking and cycling but are only accessible to vehicles for NPWS authorised purposes.
- **Track:** A narrow track that can be used for walking, running and, where designated, cycling or horse riding. Tracks are not available for motorised vehicle use.

Management trails

Over 300 km of management trails in the parks provide access for essential management operations such as fire management, weed control, feral animal control, maintenance of park facilities and services, and search and rescue activities. The primary management trails are shown on Figure 5 and a number of other management trails exist in the parks. Some management trails are maintained for all-weather 2-wheel drive access, while others are dry weather only, 4-wheel drive trails.

Blue Mountains National Park and Kanangra-Boyd National Park planning considerations

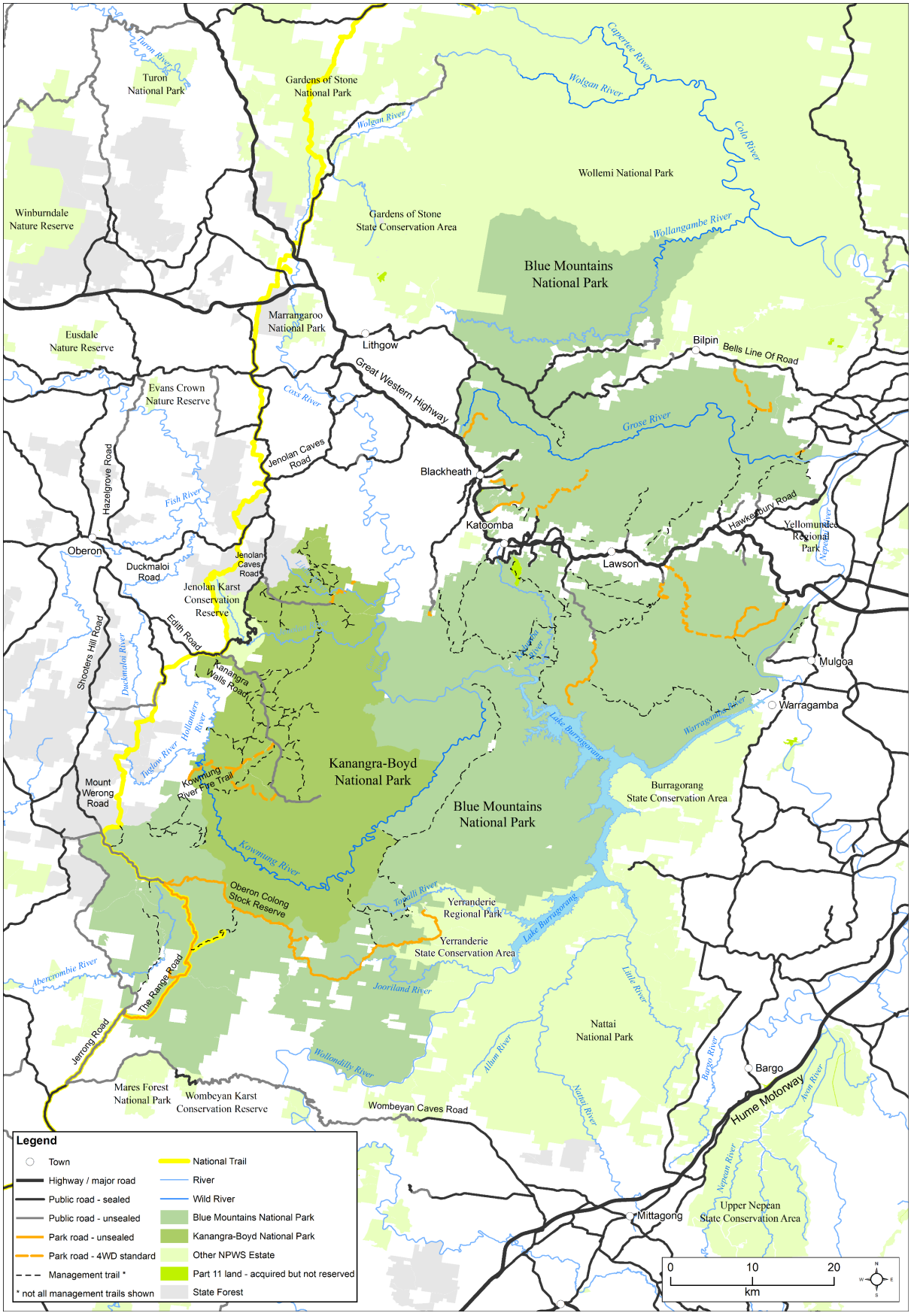

Figure 5 Roads and management trails

Park management trails are generally multiple-use trails used for management access, and providing for visitor use for walking, cycling and horse riding at some locations.

Vehicle use of management trails is only available for purposes authorised by NPWS, including uses authorised under section 153 of the NPW Act. Gates provide access to management trails for park management and other authorised purposes and allow for closure of sections of the parks as required. Entry to the management trail network is mostly via public roads, or secure access via Crown land.

The management trails in the park are an important fire management asset and most of the management trails are identified as strategic or tactical fire trails.

Under the Rural Fires Act the relevant bush fire management committees' fire access and fire trail plans identify access requirements for fire suppression and management purposes, including on land managed by NPWS. In implementing works to establish and maintain trails at the prescribed fire trail standards, NPWS ensures these works are carried out in a manner that minimises impacts to the parks' natural and cultural heritage values.

Building assets

There are a range of buildings (Table 4) and structures in the parks, with some providing visitor accommodation or other visitor facilities and services. Many of these are amenities and shelters in picnic and camping areas.

Park management facilities

There are a number of NPWS depots and offices in the parks which support park management operations, including an original park entry station and adjacent office building at Glenbrook. NPWS works depots are located at Glenbrook, Blackheath and Yerranderie in Blue Mountains National Park.

Water management infrastructure, maintained by WaterNSW, exists in the special areas. A small number of helicopter pads are maintained in the parks to support bushfire emergency response and search and rescue operations.

Table 4 Building assets in the parks

Locality	Building	Current purpose
Glenbrook	NPWS Area Office; depot	NPWS management use
	Park entry booth	Visitor information and park entry
Wentworth Falls	Conservation Hut	Cafe
Kedumba Valley	Maxwell's Hut (historic slab hut)	Building restoration in progress
Blackheath	Blue Mountains Heritage Centre	Visitor information/retail
	NPWS depot and office	NPWS management use
Green Gully, Megalong Valley	Galong cabins (2)	Visitor accommodation
	Carlon's House	Historic ruin
Mount Werong	Stone hut	Campers' shelter
Yerranderie – Government Town	Police station; courthouse	NPWS management use
	St Senan's Church	Catholic community use
	Joe Deacon's House	Historic ruin

Park-managed utilities and services

NPWS is responsible for maintaining and operating some of the powerlines, water pipelines and sewerage infrastructure that services the public and management facilities in the parks.

6.1.1 Management considerations and opportunities

NPWS must **maintain a network of roads** in the parks to cater for park visitors. The rugged terrain and highly erodible sandstone soils of the parks means road maintenance is required often and usually at high cost. The road network in the parks requires review to identify those roads that are suitable to be managed as public access roads and those where closure and rehabilitation are desirable.

Some roads in the parks, such as Mount Hay Road, are surrounded by a wilderness area but are excluded from the declared wilderness area. There are a number of management considerations relevant to these roads and the Mount Hay Road particularly, including maintaining wilderness values, road maintenance requirements, management of public vehicle access, and safety of walkers, runners and cyclists.

The nature of the terrain and soils in the parks means that **road and trail maintenance** works are intrinsically expensive, consequently a number of trails are maintained to a standard suitable for access by management vehicles only and are not available for public use. Many trails are located within declared wilderness, which places further restrictions on public use. Roads and trails in the parks are generally maintained by the NPWS via in-house or contracted services. Third-party roads, such as roads used to access facilities like power transmission lines, are generally maintained by the relevant third party.

WaterNSW require access via roads and management trails for water monitoring, and for access to dams and pipelines for inspection and maintenance.

The NPWS Fire Access and Fire Trail Program delivers improved access to lands managed under the NPW Act. The program involves **maintaining, renewing and upgrading fire trails** and the associated fire trail infrastructure to ensure that they meet the statewide fire trail standards set under the NSW Rural Fires Act.

Fire access and fire trail plans prepared under the Rural Fires Act may also identify the need for **new fire trails in the parks**. Construction of new fire trails requires an appropriate level of heritage and environmental assessment and will be subject to the requirements of the NPW Act.

NPWS maintains **aircraft landing facilities** in the parks, including helicopter landing sites and an airstrip, to support park management operations and emergency response. Public use of these facilities is only permitted for emergency purposes.

Steep slopes and erosion-prone soils place significant constraints on the locations suitable for recreation and management use. **Realignment of tracks and trails** may be required to prevent erosion and to improve environmental management. Trails no longer required for management purposes, or maintained for fire management access, could potentially be converted to walking tracks or closed and rehabilitated.

Unsealed roads and impervious surfaces, including sealed roads and car parks, can present risks to water quality. The application of water-sensitive design principles in the design and maintenance of roads will reduce this risk.

Some management trails and park roads **extend across adjacent lands** which are owned and managed by other authorities or private individuals. There are opportunities to identify these issues in a reserve access strategy and secure access through formal agreements or other legal instruments where appropriate and required.

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At some popular visitor destinations (e.g. Mount Hay Road and Narrow Neck), car parks and **roads require upgrading** to protect park values and improve traffic flow, public safety and user amenity. Other high-use roads which are currently unsealed (e.g. the Paterson Range and Tabaraga trails) may require site hardening to improve or to maintain their standard.

The **maintenance of roads** (park roads and management trails) is guided by the NPWS roads manual, and associated policies. Decisions regarding the prioritisation of maintenance are achieved through reference to the roads manual, the Asset Maintenance System and consultation with the broader community where required.

7. Non-park infrastructure and services

The parks contain infrastructure and other assets which are owned and operated by other organisations or individuals. Access is required for the use, operation, maintenance and repair of this infrastructure. A range of non-NPWS uses also occur in the parks.

7.1 Non-NPWS infrastructure and services

In Blue Mountains National Park infrastructure owned and operated by other organisations or individuals includes public utility infrastructure (e.g. electricity transmission lines, water pipelines and sewer mains), communications towers, a fire tower, WaterNSW infrastructure (huts, gauging station, flying fox, helipad, pluviometers, seismic stations), a number of quarries, easements and rights of way (used for purposes such as sewage and waste disposal and electricity supply) and the Scenic World Scenic Skyway. In Kanangra-Boyd National Park non-NPWS infrastructure includes weather stations managed by the Bureau of Meteorology on Boyd and Cronje mountains, and a number of pluviometers (rain gauges) managed by WaterNSW.

There are parcels of non-NPWS land, some with infrastructure, that are completely or partially surrounded by the parks or have no other feasible access other than through NPWS lands.

7.1.1 Management considerations and opportunities

All non-NPWS infrastructure and use of the parks by third parties **requires authorisation to lawfully occupy and use the land**. Generally, this authorisation is managed by leases, licences and easements. These instruments define the minimum requirements for ensuring the protection of the natural and cultural values of the parks. NPWS maintains a public register that identifies leases, easements and rights of way granted under the NPW Act and licences granted under section 153D of this Act.

New infrastructure can only be constructed on park pursuant to authorisation under the NPW Act (e.g. sections 153 and 153D) and following an environmental impact assessment under the *Environmental Planning and Assessment Act 1979*.

There are opportunities to **remove redundant infrastructure** and rehabilitate disturbed sites and access roads that are no longer required, except where other relevant considerations, such as environmental impact, justify leaving them in situ.

The installation and maintenance of transmission lines and other utility infrastructure has a **potential impact on the environment** by clearing or trimming vegetation, using herbicides, maintaining access trails, and the visual impact of the transmission lines, towers and pipelines.

Under the *Electricity Supply Act 1995* operators can use and maintain **existing powerlines** not covered by a formal easement or agreement, however, operators must comply with the NPW Act and Regulation when carrying out any maintenance or replacement work. Some works carried out by these agencies are subject to NPWS consent, and environmental impact assessments.

Access via the parks to properties completely or partially surrounded by the parks, or where there is no other feasible access, is required. Section 153C of the NPW Act enables legal access to these properties in accordance with the NPWS *Property access policy*.

Appendices

Appendix A Scientific plant and animal names

The following table shows the common and scientific name for plant and animal species mentioned in this plan.

Species marked with an * are not native.

Table 5 Common and scientific names

Common name	Scientific name
Plants	
African lovegrass*	*Eragrostis curvula*
Agapanthus*	*Agapanthus* spp.
Austral mulberry	*Hedycarya angustifolia*
Bamboo*	*Bambusa* spp.
Blackberry*	*Rubus fruticosus aggregate*
Blue Mountains ash	*Eucalyptus oreades*
Bridal creeper*	*Asparagus asparagoides*
Blaxland's stringybark	*Eucalyptus blaxlandii*
Blue gum	*Eucalyptus saligna*
Blue Mountains cliff eyebright	*Euphrasia bowdeniae*
Boneseed*	*Chrysanthemoides monilifera* subsp. *monilifera*
Brittle gum	*Eucalyptus mannifera* subsp. *mannifera*
Brown barrel	*Eucalyptus fastigata*
Buttercup doubletail	*Diuris aequalis*
Cambage kunzea	*Kunzea cambagei*
Camden white gum	*Eucalyptus benthamii*
Camden woollybutt; Paddys River box	*Eucalyptus macarthurii*
Century plant*	*Agave americanca*
Coveny's zieria	*Zieria covenyi*
Crofton weed*	*Ageratina adenophora*
Deane's paperbark	*Melaleuca deanei*
Dwarf mountain pine	*Pherosphaera fitzgeraldii*
English ivy*	*Hedera helix*
Evans sedge	*Lepidosperma evansianum*
Fletcher's drumsticks	*Isopogon fletcheri*
Forest red gum	*Eucalyptus tereticornis*
Gordon's wattle	*Acacia gordonii*

Gorse*	*Ulex europaeus*
Grey gum	*Eucalyptus punctata*
Himalayan honeysuckle*	*Leycesteria formosa*
Japanese honeysuckle*	*Lonicera japonica*
Kowmung hakea	*Hakea dohertyi*
Kowmung wattle	*Acacia clunies-rossiae*
Lantana*	*Lantana camara*
Montbretia*	*Crocosmia crocosmiiflora*
Mountain gum	*Eucalyptus cypellocarpa*
Mountain trachymene	*Trachymene scapigera*
Moth vine*	*Araujia sericifera*
Mother of millions*	*Bryophyllum delagoense*
Narrow-leaved ironbark	*Eucalyptus crebra*
Narrow-leaved peppermint	*Eucalyptus radiata* subsp. *radiata*
Olive species*	*Olea* spp.
Pattersons curse*	*Prunus lusitanica*
Pines (Monterey pine and other pine species)*	*Pinus radiata and Pinus* spp.
Prickly pears*	*Opuntia* spp.
Prickly tea tree	*Leptospermum juniperinum*
Privet (including small-leaved privet)*	*Ligustrum* spp.
Red bloodwood	*Corymbia gummifera*
Red stringybark	*Eucalyptus macrorhyncha*
Rough possumwood	*Quintinia sieberi*
Saffron thistle*	*Carthamus lanatus*
Sassafras	*Doryphora sassafras*
Scotch broom*	*Cytisus scoparius*
Scribbly gum	*Eucalyptus racemosa*
Scrub turpentine	*Rhodamnia rubescens*
Serrated tussock*	*Nassella trichotoma*
Silver banksia	*Banksia marginata*
Silvertop ash	*Eucalyptus sieberi*
Smooth bush-pea	*Pultenaea glabra*
Smooth-barked apple	*Angophora costata*
Snow gum	*Eucalyptus pauciflora*
St John’s wort*	*Hypericum perforatum*
Sydney peppermint	*Eucalyptus piperita*
Tablelands scribbly gum	*Eucalyptus rossii*
Tree of heaven*	*Ailanthus altissima*

Turkey rhubarb*	*Rumex sagittatus*
Tutsan*	*Hypericum androsaemum*
Turpentine	*Syncarpia glomulifera*
Whiskey grass*	*Andropogon virginicus*
White box	*Eucalyptus albens*
Willows*	*Salix* spp.
Yellow box	*Eucalyptus melliodora*
Animals	
Adam's emerald dragonfly	*Archaeophya adamsi*
American corn snake*	*Pantherophis guttatus*
Australian owlet-nightjar	*Aegotheles cristatus*
Barking owl	*Ninox connivens*
Beautiful firetail	*Stagonopleura bella*
Bell miner	*Manorina melanophrys*
Black-chinned honeyeater (eastern subspecies)	*Melithreptus gularis gularis*
Blue Mountains water skink	*Eulamprus leuraensis*
Booroolong frog	*Litoria booroolongensis*
Broad-headed snake	*Hoplocephalus bungaroides*
Brown antechinus	*Antechinus stuartii*
Brown treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*
Brush-tailed rock-wallaby	*Petrogale penicillata*
Bush rat	*Rattus fuscipes*
Cat*	*Felis catus*
Cattle*	*Bos taurus*
Chocolate wattled bat	*Chalinolobus morio*
Common brushtail possum	*Trichosurus vulpecula*
Common eastern froglet	*Crinia signifera*
Common ringtail possum	*Pseudocheirus peregrinus*
Common wallaroo	*Osphranter robustus*
Common wombat	*Vombatus ursinus*
Copper-tailed skink	*Ctenotus taeniolatus*
Deer (fallow deer and red deer)*	*Dama dama and Cervus elaphus*
Diamond firetail	*Stagonopleura guttata*
Dingo	*Canis lupus dingo*
Dog (domestic and wild)*	*Canis lupus familiaris*
Eastern false pipistrelle	*Falsistrellus tasmaniensis*
Eastern coastal free-tailed bat	*Micronomus norfolkensis*

Eastern grey kangaroo	*Macropus giganteus*
Eastern pygmy-possum	*Cercartetus nanus*
Eastern snake-necked turtle	*Chelodina longicollis*
Eastern yellow robin	*Eopsaltria australis*
Flame robin	*Petroica phoenicea*
Giant burrowing frog	*Heleioporus australiacus*
Giant dragonfly	*Petalura gigantea*
Goat*	*Capra hircus*
Gould's long-eared bat	*Nyctophilus gouldi*
Gould's wattled bat	*Chalinolobus gouldii*
Greater broad-nosed bat	*Scoteanax rueppellii*
Grey-headed flying-fox	*Pteropus poliocephalus*
Highland copperhead	*Austrelaps ramsayi*
Honeybees, European*	*Apis mellifera*
Horse*	*Equus caballus*
Jacky winter	*Microeca fascinans*
Koala	*Phascolarctos cinereus*
Large bent-winged bat	*Miniopterus orianae oceanensis*
Large forest bat	*Vespadelus darlingtoni*
Large-eared pied bat	*Chalinolobus dwyeri*
Leaf-green tree frog	*Litoria phyllochroa*
Little forest bat	*Vespadelus vulturnus*
Littlejohn’s tree frog	*Litoria littlejohni*
Little lorikeet	*Glossopsitta pusilla*
Little red flying-fox	*Pteropus scapulatus*
Long-nosed bandicoot	*Perameles nasuta*
Macquarie perch	*Macquaria australasica*
Masked owl	*Tyto novaehollandiae*
Mountain brushtail possum	*Trichosurus cunninghami*
New Holland honeyeater	*Phylidonyris novaehollandiae*
New Holland mouse	*Pseudomys novaehollandiae*
Pale-flecked garden sunskink	*Lampropholis guichenoti*
Peron's tree frog	*Litoria peronii*
Pig*	*Sus scrofa*
Platypus	*Ornithorhynchus anatinus*
Powerful owl	*Ninox strenua*
Rabbit*	*Oryctolagus cuniculus*
Red fox*	*Vulpes vulpes*

Red-crowned toadlet	*Pseudophryne australis*
Red-eared slider*	*Trachemys scripta elegans*
Red-necked wallaby	*Notamacropus rufogriseus*
Regent honeyeater	*Anthochaera phrygia*
Rosenberg's goanna	*Varanus rosenbergi*
Rufous whistler	*Pachycephala rufiventris*
Scarlet robin	*Petroica boodang*
Sooty owl	*Tyto tenebricosa*
Southern boobook	*Ninox novaeseelandiae*
Southern brown bandicoot (eastern)	*Isoodon obesulus obesulus*
Southern emu-wren	*Stipiturus malachurus*
Southern forest bat	*Vespadelus regulus*
Southern greater glider	*Petauroides volans*
Southern myotis	*Myotis macropus*
Speckled warbler	*Chthonicola sagittata*
Spotted pardalote	*Pardalotus punctatus*
Spotted-tailed quoll	*Dasyurus maculatus*
Squirrel glider	*Petaurus norfolcensis*
Stuttering frog	*Mixophyes balbus*
Sugar glider	*Petaurus breviceps*
Swamp rat	*Rattus lutreolus*
Swamp wallaby	*Wallabia bicolor*
Swift parrot	*Lathamus discolor*
Tawny frogmouth	*Podargus strigoides*
Tussock skink	*Pseudemoia pagenstecheri*
Verreaux's tree frog	*Litoria verreauxii*
Wedge-tailed eagle	*Aquila audax*
White-throated needletail	*Hirundapus caudacutus*
White-throated treecreeper	*Cormobates leucophaea*
White-winged chough	*Corcorax melanorhamphos*
Wild dog*	*Canis lupus* subsp.
Willow*	*Salix* spp.
Yellow-bellied glider	*Petaurus australis*

Common plant names from PlantNET (The NSW Plant Information Network System). Royal Botanic Gardens and Domain Trust, Sydney. http://plantnet.rbgsyd.nsw.gov.au

Animal names from Bionet Atlas, www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet/about-bionet-atlas

Appendix B Vegetation formations in the parks

Table 6 Vegetation formations in the parks

Vegetation formation (in order of formation dominance)	Description and extent; threatened ecological communities (TECs) represented
Dry sclerophyll forests	Dry sclerophyll forests are the most widespread formation in the parks and contain much of its eucalypt diversity. These forests dominate the exposed, low-nutrient soils of the vast sandstone plateaus and the valley slopes of the softer Permian geological deposits. Their widespread distribution and flammable plants make these forests a fire-prone, almost continuous matrix that allows the spread of major landscape-scale fires. Other more restricted ecosystems such as rainforests, heaths and swamps occur as 'islands' in this matrix. TECs: Blue Mountains Shale Cap Forest endangered ecological community (EEC).
Wet sclerophyll forests	Wet sclerophyll forests occur mostly in Kanangra-Boyd National Park and south-western Blue Mountains National Park. These forests contain stands of straight-trunked eucalypts towering above a lush, green understorey. They occur on sheltered slopes and gullies where deep soils provide the moisture and nutrients they need.
Rainforests	Rainforests are confined to isolated pockets, where moisture and steep terrain have ensured their protection over time. TECs: Western Sydney Dry Rainforest in the Sydney Basin Bioregion EEC.
Heathlands	Heathlands are shrubby, largely treeless communities that occupy a small area of the parks. They are restricted to shallow, nutrient poor, sandy soils on rock benches and exposed situations, usually ridge tops.
Freshwater wetlands	Freshwater wetlands include upland swamps on waterlogged soils in the higher rainfall parts of the sandstone plateaux. TECs: Blue Mountains Swamps vulnerable ecological communities (VEC); Montane Peatlands and Swamps EEC; Newnes Plateau Shrub Swamp EEC.
Forested wetlands	Forested wetlands mostly occur as narrow strips of river oaks along large rivers and creeks. Forested wetlands are freshwater wetlands dominated by trees, with a distinctive understorey that is able to survive periodic inundation. TECs: River-flat Eucalypt Forest on Coastal Floodplains EEC.
Grassy woodlands	Grassy woodlands occupy only a small area of the parks, occurring at low and high altitudes on deeper soils of moderate to high fertility derived from shales and granites. TECs: Shale/Sandstone Transition Forest critically endangered ecological community (CEEC); White Box Yellow Box Blakeley's Red Gum Woodland CEEC.

Source: adapted from Hammill and Tasker (2010).

Appendix C Threatened plants in the parks

Table 7 Threatened plants recorded in the parks

Common name	Scientific name	BC Act status	EPBC Act status	National park
	Acacia baueri subsp. *aspera*	V	-	BM
	Acrophyllum australe	V	V	BM
	Ancistrachne maidenii	V	-	BM
	Asterolasia buxifolia	E	-	BM
	Darwinia peduncularis	V	-	BM
	Dillwynia tenuifolia	V	-	BM, KB
	Epacris hamiltonii	E	E	BM
	Gyrostemon thesioides	E	-	BM
	Hibbertia puberula	E	-	BM
	Leionema lachnaeoides	E	E	BM
	Leucopogon fletcheri subsp. fletcheri	E	-	BM
	Persoonia oxycoccoides	E	-	KB
	Pterostylis chaetophora	V	-	BM
	Solanum armourense	E (AIS)	-	BM, KB
	Tetratheca glandulosa	V	-	BM
	Xanthosia scopulicola	V	-	BM
	Zieria involucrata	E	V	BM
Black gum	*Eucalyptus aggregata*	V	V	BM
Blue Mountains cliff eyebright	*Euphrasia bowdeniae*	V	V	BM
Bristly shield fern	*Lastreopsis hispida*	E	-	BM
Brown pomaderris	*Pomaderris brunnea*	E	V	BM
Buttercup doubletail	*Diuris aequalis*	E (AIS)	V	KB
Bynoe’s wattle	*Acacia bynoeana*	E	V	BM
Cambage kunzea	*Kunzea cambagei*	V	V	BM, KB
Camden white gum	*Eucalyptus benthamii*	V	V	BM
Cotoneaster pomaderris	*Pomaderris cotoneaster*	E	E	BM, KB
Coveny’s zieria	*Zieria covenyi*	E (AIS)	E	BM
Deane's boronia	*Boronia deanei*	V	V	KB
Deane’s paperbark	*Melaleuca deanei*	V	V	BM
Dense cord-rush	*Baloskion longipes*	V	V	BM, KB
Dwarf mountain pine	*Pherosphaera fitzgeraldii*	E (AIS)	E	BM
Evans sedge	*Lepidosperma evansianum*	V	-	BM

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Common name	Scientific name	BC Act status	EPBC Act status	National park
Fletcher's drumsticks	*Isopogon fletcheri*	V	V	BM
Flockton wattle	*Acacia flocktoniae*	V	V	BM, KB
Gordon's wattle	*Acacia gordonii*	E (AIS)	E	BM
Juniper-leaved grevillea	*Grevillea juniperina subsp. juniperina*	V	-	BM
Kanangra wattle	*Acacia clunies-rossiae*	V	-	BM, KB
Klaphake's sedge	*Carex klaphakei*	E	-	BM
Kowmung hakea	*Hakea dohertyi*	E (AIS)	E	BM, KB
Megalong Valley bottlebrush	*Callistemon megalongensis*	CE	CE	BM
Mittagong geebung	*Persoonia glaucescens*	E	V	BM
Mountain trachymene	*Trachymene scapigera*	E (AIS)	E	KB
Musty leek orchid	*Prasophyllum pallens*	V	-	BM
Narrow-leaf finger fern	*Grammitis stenophylla*	E	-	BM
Needle geebung	*Persoonia acerosa*	V	V	BM, KB
Netted bottle brush	*Callistemon linearifolius*	V	-	BM
Paddys River box, Camden woollybutt	*Eucalyptus macarthurii*	E	E	KB
Pultenaea villifera (Sieber ex DC.) population in the Blue Mountains local government area	*Pultenaea villifera*	EP	-	BM
Rough eyebright	*Euphrasia scabra*	E	-	KB
Scrub turpentine	*Rhodamnia rubescens*	CE	CE	BM
Slaty leek orchid	*Prasophyllum fuscum*	CE	V	BM
Slaty red gum	*Eucalyptus glaucina*	V	V	BM
Small pale grass-lily	*Caesia parviflora var. minor*	E	-	BM
Smooth bush-pea	*Pultenaea glabra*	V	V	BM
Sparse heath	*Epacris sparsa*	V	V	BM
Swamp everlasting	*Xerochrysum palustre*	-	V	KB
Sydney plains greenhood	*Pterostylis saxicola*	E	E	KB
Velvet Zieria	*Zieria murphyi*	V	V	BM
Woronora beard-heath	*Leucopogon exolasius*	V	V	BM

Notes: BC Act = *Biodiversity Conservation Act 2016*; EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; CE = critically endangered; E = endangered; V = vulnerable; AIS = asset of intergenerational significance; - = not listed; BM = Blue Mountains; KB = Kanangra-Boyd.

Source: BioNet Atlas (DPE 2022a).

Appendix D Threatened animals in the parks

Table 8 Threatened animals recorded in the parks

Common name	Scientific name	BC Act status	EPBC Act status	National park
Frogs				
Booroolong frog	*Litoria booroolongensis*	E	E	KB
Giant barred frog	*Mixophyes iteratus*	V	E	BM
Giant burrowing frog	*Heleioporus australiacus*	V	V	BM, KB
Littlejohn's tree frog	*Litoria littlejohni*	E	V	BM, KB
Red-crowned toadlet	*Pseudophryne australis*	V	-	BM
Stuttering frog	*Mixophyes balbus*	E	V	BM
Reptiles				
Blue Mountains water skink	*Eulamprus leuraensis*	E	E	BM
Broad-headed snake	*Hoplocephalus bungaroides*	E	V	BM
Rosenberg's goanna	*Varanus rosenbergi*	V	-	BM, KB
Birds				
Barking owl	*Ninox connivens*	V	-	BM, KB
Black bittern	*Ixobrychus flavicollis*	V	-	BM
Black falcon	*Falco subniger*	V	-	BM
Black-chinned honeyeater (eastern subspecies)	*Melithreptus gularis*	V	-	BM
Brown treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	-	BM, KB
Diamond firetail	*Stagonopleura guttata*	V	-	BM
Dusky woodswallow	*Artamus cyanopterus cyanopterus*	V	-	BM, KB
Flame robin	*Petroica phoenicea*	V	-	BM, KB
Gang-gang cockatoo	*Callocephalon fimbriatum*	E	-	BM, KB
Glossy black-cockatoo	*Calyptorhynchus lathami*	V	-	BM, KB
Little eagle	*Hieraaetus morphnoides*	V	-	BM, KB
Little lorikeet	*Glossopsitta pusilla*	V	-	BM, KB
Masked owl	*Tyto novaehollandiae*	V	-	BM
Powerful owl	*Ninox strenua*	V	-	BM, KB
Regent honeyeater	*Anthochaera phrygia*	CE	CE	BM
Scarlet robin	*Petroica boodang*	V	-	BM, KB
Sooty owl	*Tyto tenebricosa*	V	-	BM, KB

Blue Mountains National Park and Kanangra-Boyd National Park planning considerations

Common name	Scientific name	BC Act status	EPBC Act status	National park
Speckled warbler	*Chthonicola sagittata*	V	-	BM
Square-tailed kite	*Lophoictinia isura*	V	-	BM
Swift parrot	*Lathamus discolor*	E	CE	BM
Turquoise parrot	*Neophema pulchella*	V	-	BM
Varied sittella	*Daphoenositta chrysoptera*	V	-	BM, KB
White-bellied sea-eagle	*Haliaeetus leucogaster*	V	-	BM
White-throated needletail	*Hirundapus caudacutus*	V	V	BM, KB
Mammals				
Brush-tailed rock-wallaby	*Petrogale penicillata*	E	V	BM, KB
Eastern cave bat	*Vespadelus troughtoni*	V	-	BM
Eastern coastal free-tailed bat	*Micronomus norfolkensis*	V	-	BM
Eastern false pipistrelle	*Falsistrellus tasmaniensis*	V	-	BM, KB
Eastern pygmy-possum	*Cercartetus nanus*	V	-	BM, KB
Greater broad-nosed bat	*Scoteanax rueppellii*	V	-	BM, KB
Grey-headed flying-fox	*Pteropus poliocephalus*	V	V	BM, KB
Koala	*Phascolarctos cinereus*	E	E	BM, KB
Large bent-winged bat	*Miniopterus orianae oceanensis*	V	-	BM, KB
Large-eared pied bat	*Chalinolobus dwyeri*	V	V	BM, KB
Little bent-winged bat	*Miniopterus australis*	V	-	BM
New holland mouse	*Pseudomys novaehollandiae*	-	V	BM, KB
Southern brown bandicoot (eastern)	*Isoodon obesulus obesulus*	E	E	BM
Southern greater glider	*Petauroides volans*	E	E	BM, KB
Southern myotis	*Myotis macropus*	V	-	BM
Spotted-tailed quoll	*Dasyurus maculatus*	V	E	BM, KB
Squirrel glider	*Petaurus norfolcensis*	V	-	BM, KB
Yellow-bellied glider	*Petaurus australis australis*	V	V	BM, KB
Yellow-bellied sheathtail-bat	*Saccolaimus flaviventris*	V	-	BM

Blue Mountains National Park and Kanangra-Boyd National Park planning considerations

Common name	Scientific name	BC Act status	EPBC Act status	National park
Insects				
Giant dragonfly	*Petalura gigantea*	E	-	BM, KB

Notes: BC Act = *Biodiversity Conservation Act 2016*; EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*; CE = critically endangered; E = endangered; V = vulnerable; - = not listed; BM = Blue Mountains National Park; KB = Kanangra-Boyd National Park.

Appendix E Key threatening processes

Table 9 Key threatening processes that apply in the parks

Common name	BC Act	EPBC Act
Aggressive exclusion of birds from woodland and forest habitat by abundant noisy miners, *Manorina melanocephala* (Latham, 1802)	KTP	KTP
Alteration of habitat following subsidence due to longwall mining	KTP	-
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	KTP	-
Anthropogenic climate change	KTP	KTP
Bushrock removal	KTP	-
Clearing of native vegetation	KTP	KTP
Competition and grazing by the feral European rabbit, *Oryctolagus cuniculus* (L.)	KTP	KTP
Competition and habitat degradation by feral goats, *Capra hircus* Linnaeus 1758	KTP	KTP
Competition from feral honey bees, *Apis mellifera* L.	KTP	-
Forest eucalypt dieback associated with over-abundant psyllids and bell miners	KTP	-
Herbivory and environmental degradation caused by feral deer	KTP	-
High-frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	KTP	-
Importation of red imported fire ants *Solenopsis invicta* Buren 1972	KTP	KTP
Infection by psittacine circoviral (beak and feather) disease affecting endangered psittacine species and populations	KTP	KTP
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	KTP	KTP
Infection of native plants by *Phytophthora cinnamomi*	KTP	KTP
Introduction and establishment of exotic rust fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	KTP	-
Introduction of the large earth bumblebee *Bombus terrestris* (L.)	KTP	-
Invasion and establishment of exotic vines and scramblers	KTP	-
Invasion and establishment of Scotch broom (*Cytisus scoparius*)	KTP	-
Invasion and establishment of the cane toad (*Bufo marinus*)	KTP	KTP
Invasion of native plant communities by African olive *Olea europaea* subsp. *cuspidata* (Wall. ex G. Don) Cif.	KTP	-
Invasion of native plant communities by *Chrysanthemoides monilifera*	KTP	-
Invasion of native plant communities by exotic perennial grasses	KTP	-
Invasion of the yellow crazy ant, *Anoplolepis gracilipes* (Fr. Smith) into NSW	KTP	-
Invasion, establishment and spread of lantana (*Lantana camara* L. sens. Lat)	KTP	-

Blue Mountains National Park and Kanangra-Boyd National Park planning considerations

Common name	BC Act	EPBC Act
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	KTP	KTP
Loss of hollow-bearing trees	KTP	-
Loss or degradation (or both) of sites used for hill-topping by butterflies	KTP	-
Predation and hybridisation by feral dogs, *Canis lupus familiaris*	KTP	-
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or Mosquito Fish)	KTP	-
Predation by the European red fox *Vulpes vulpes* (Linnaeus, 1758)	KTP	KTP
Predation by the feral cat *Felis catus* (Linnaeus, 1758)	KTP	KTP
Predation, habitat degradation, competition and disease transmission by feral pigs, *Sus scrofa* Linnaeus 1758	KTP	KTP
Removal of dead wood and dead trees	KTP	-

Notes: BC Act = Biodiversity Conservation Act 2016; EPBC Act = Environment Protection and Biodiversity Conservation Act 1999; - = not listed as a KTP.

Appendix F Feral animals and weeds in the parks

The following tables summarise key information on feral animals and weeds in the park at the time of publication of this plan. Current information on the status of feral animals and weeds and whether they have a threat abatement plan can be found on the Department of Climate Change, Energy, the Environment and Water's website. Further pest information on the parks is also available in the relevant NPWS pest management strategy. The Local Land Service Act declares certain animals to be pests.

Priority feral animals

The following feral animals are present in the parks and are a priority for management and control.

Table 10 Priority feral animals for management

Common name	Scientific name	KTP	NSW TAP
Cat	*Felis catus*	Y	N
Deer (fallow deer and red deer)	*Dama dama and Cervus elaphus*	Y	N
Red fox	*Vulpes vulpes*	Y	Y
Feral cattle	*Bos taurus*	N	N
Feral goat	*Capra hircus*	Y	N
Feral pig	*Sus scrofa*	Y	N
Rabbit	*Oryctolagus cuniculus*	Y	N
Wild dog (incl. dingo and feral dog and hybrids)	*Canis lupus* subspp.	Y	N

Notes: KTP = key threatening process listed under the Biodiversity Conservation Act and Environment Protection and Biodiversity Conservation Act; NSW TAP = threat abatement plan prepared under the Biodiversity Conservation Act.

Priority weeds

The following weed plants are present in the parks and are a priority for management and control.

Table 11 Priority weeds for management

Common name	Scientific name	WONS	KTP	LLS priority
African lovegrass[CC]	*Eragrostis curvula*	-	-	Y
Agapanthus	*Agapanthus* spp.	-	-	-
Alligator weed[S]	*Alternanthera philoxeroides*	Y	-	Y
Berberis	*Berberis aristata*	-	-	-
Blackberry [S]	*Rubus fruticosus aggregate*	Y	-	Y
Bridal creeper [RP]	*Asparagus asparagoides*	Y	-	Y
Buddleia	*Buddleia davidii*	-	-	-
Arum lily/calla lily	*Zantedeschia aethiopica*	-	-	-

Blue Mountains National Park and Kanangra-Boyd National Park planning considerations

Common name	Scientific name	WONS	KTP	LLS priority
Cape ivy	*Delairea odorata*	-	-	-
Crofton weed	*Ageratina adenophora*	-	-	-
Firethorn	*Pyracantha* spp.	-	-	-
Fireweed[S]	*Senecio madagascariensis*	Y	-	Y
Ginger lily	*Hedychium gardnerianum*	-	-	-
Gorse[S]	*Ulex europaeus*	Y	-	Y
Lantana[S]	*Lantana camara*	Y	Y	Y
Mistflower	*Ageratina riparia*	-	-	-
Montbretia	*Crocosmia crocosmiiflora*	-	-	-
Monterey pine and other pine species	*Pinus radiata and Pinus* spp.	-	-	-
Montpellier (Cape) broom[S]	*Genista monspessulana*	-	-	Y
Moth vine	*Araujia sericifera*	-	-	-
Olive species	*Olea* spp.	-	Y	Y
Ox-eye daisy [RP]	*Leucanthemum vulgare*	-	-	Y
Pattersons curse	*Prunus lusitanica*	-	-	-
Prickly pears	*Opuntia* spp.	Y	-	-
Privet	*Ligustrum* spp.	-	-	Y
Saffron thistle	*Carthamus lanatus*	-	-	-
Scotch broom[S]	*Cytisus scoparius*	Y	Y	Y
Serrated tussock[S]	*Nassella trichotoma*	Y	-	Y
St John's wort [RP]	*Hypericum perforatum*	-		Y
Sycamore maple[CC]	*Acer pseudoplatanus*	-	-	Y
Tree of heaven	*Ailanthus altissima*	-	-	-
Turkey rhubarb	*Rumex sagittatus*	-	-	-
Tutsan [RP]	*Hypericum androsaemum*	-	-	Y
Whiskey grass	*Andropogon virginicus*	-	-	-
Willows[S]	*Salix* spp.	Y	-	Y

Notes: WONS = Weed of National Significance; KTP = key threatening process listed under the Biodiversity Conservation Act and Environment Protection and Biodiversity Conservation Act; LLS (Local Land Services)

S = state-level priority weed under Greater Sydney Strategic Weed Management Plan 2017.

RC = weed of regional concern under Greater Sydney Strategic Weed Management Plan 2017.

RP = regional priority weed under Central Tablelands Strategic Weed Management Plan 2017.

CC = community concern list (Central Tablelands). Species that are high priority for asset protection and are actively managed under a number of current programs. It is not feasible to contain or eradicate these species however, minimising their impacts, is reasonably practicable.

- = not applicable.

Source: OEH (2012), GSLLS (2017), CTLLS (2017).

References

Adapt NSW (n.d.) *Interactive climate change projections map*, Adapt NSW webpage.

Anstis M, Alford RA, Gillespie GR (1998) 'Breeding biology of *Litoria booroolongensis* (Moore 1961) and *Litoria lesueurii* (Dumeril and Bibron 1841) and comments on population declines of *L. booroolongensis'*, *Transactions of the Royal Society of South Australia*, 122:33–43.

AWM (Australian War Memorial) (2023) *Splendor Rock*, Places of Pride, National Register of War Memorials webpage.

Barrett G, Silcocks A, Barry S, Cunningham R, Poulter R (2003) *The new atlas of Australian birds*, Royal Australian Ornithologists Union, Hawthorn East, Victoria.

Briggs JD, Leigh JH (1996) *Rare or threatened plants: 1995 revised edition*, CSIRO Publishing, Collingwood, Victorial.

Cairns K, Crowther M, Nesbitt B & Letnic M (2021) 'The myth of wild dogs in Australia: are there any out there?', *Australian Mammology*, 10.1071/AM20055.

Cassar D, Chafer CJ (2007) *Development of a spatio-temporal index of vegetation condition using satellite imagery: algorithm development and preliminary findings* [unpublished report].

Chafer CJ (2007) *Water yield patterns over a 15 year period in 7 subcatchments of the Hawkesbury-Nepean catchment*, unpublished International meeting of Fire Effects on Soil Properties Conference, Barcelona, Spain.

Commonwealth of Australia (2009) *Australian World Heritage intergovernmental agreement* (EPHC19/5.1/A) [unpublished agreement between the Australian Government and state and territory governments], Canberra.

Commonwealth of Australia (2007) *Government Notices Gazette*, GN20, 23 May 2007, S99.

Commonwealth of Australia (2020) *Greater Blue Mountains Area state of conservation update: April 2020* [PDF 2MB], Department of Agriculture, Water and the Environment, Canberra.

CTLLS (Central Tablelands Local Land Services) (2017) *Central Tablelands regional strategic weed management plan 2017–2022* [PDF 1.5MB], CTLLS.

CTLLS (2018) *Central Tablelands regional strategic pest animal management plan 2018–2023* [PDF 1.9MB], CTLLS.

Cunningham C (1996) Blue Mountains rediscovered – beyond the myths of early Australian exploration, Kangaroo Press, Kenthurst, NSW.

Daly G, Pennay M, Coombes D (2002) 'Surveys for the stuttering frog *Mixophyes balbus* on the south coast of New South Wales', *Herpetofauna,* 32:110–130.

DAWE (Department of Agriculture, Water and the Environment, Cth) (2022) 'Potential cumulative impacts of mining on the outstanding universal value of the Greater Blue Mountains Area', DAWE, Canberra.

DCCEEW (Department of Climate Change, Energy, the Environment and Water, Cth) (n.d.) *Listed key threatening processes*, DCCEEW webpage.

DEC (Department of Environment and Conservation, NSW) (2004a) Assessment of the Murruin Wilderness [unpublished report], Central Conservation Programs & Planning Branch, DEC, Sydney.

DEC (2004b) *The vertebrate fauna of Kanangra-Boyd National Park* [unpublished report], DEC, Sydney.

DEC (2004c) *The vertebrate fauna of south-western Blue Mountains National Park* [unpublished report], DEC, Sydney.

DEC (2005a) *Kowmung River: Kanangra-Boyd National Park, wild river assessment*, DEC, Sydney.

DEC (2005b) *Visitors to central branch parks 2004/2005: research report,* prepared by Taverner Research consultants for the DECC.

DEC (2006a) *The native vegetation of the Woodford and Erskine ranges, Kings Tableland and Narrowneck Peninsula in the Blue Mountains National Park* [unpublished draft report], DEC, Sydney.

DEC (2006b) 'Recovery plan for the large forest owls: powerful owl (*Ninox strenua*), sooty owl (*Tyto tenebricosa*) and masked owl (*Tyto novaehollandiae*)', Environment and Heritage.

DECC (Department of Environment and Climate Change, NSW) (2007a) *Terrestrial vertebrate fauna of the Greater Southern Sydney Region: volume 1 – background report*, Sydney Catchment Authority and DECC, Sydney South.

DECC (2007b) *Terrestrial vertebrate fauna of the Greater Southern Sydney Region: volume 3 – the fauna of the Warragamba Special Area*, Sydney Catchment Authority and DECC, Sydney South.

DECC (2008c) *Towards an Aboriginal land management framework for NSW – discussion paper* [PDF 1.1MB], DECC, Sydney South.

DECC (2008a) *Grose River, Blue Mountains National Park wild river assessment 2008* [PDF 321KB], DECC, Sydney South.

DECC (2008d) 'Colo River, Wollemi and Blue Mountains national parks wild river assessment 2008', Environment and Heritage.

DECC (2008e) 'The vertebrate fauna of north-eastern Blue Mountains National Park', DECC, Sydney South.

DECC (2008f) 'Recovery plan for the brush-tailed rock-wallaby (Petrogale penicillata)', Environment and Heritage.

DECC (2008b) *Cultural landscapes and park management: a literature snapshot A report for the cultural landscapes: connecting history, heritage and reserve management research project* [PDF 375KB], DECC, Sydney South

DECC (2009a) 'Greater Blue Mountains World Heritage Area strategic plan', Environment and Heritage.

DECC (2009b) The vertebrate fauna of the Wollangambe and Upper Wolgan area [PDF 5.1MB], DECC, Sydney South.

DECCW (Department of Environment, Climate Change and Water, NSW) (2010) *Guide to NSW karst and caves* [PDF 8.3MB], DECCW, Sydney.

DPE (Department of Planning and Environment, NSW) (2022a) *BioNet Atlas*, Environment and Heritage website, accessed 2022.

DPE (2022b) *Threatened biodiversity profile search*, Environment and Heritage website, accessed 2022.

DPE (2022c) *State Vegetation Type Map*, Environment and Heritage website, accessed 2023.

DPE (2023) *Blue Mountains National Park*, Environment and Heritage website, accessed 2023.

DPI (Department of Primary Industries, NSW) (2015) *Indicative distribution in NSW: Macquarie perch* [PDF 2.5MB], DPI, Sydney.

DPI (2022a) *Adams emerald dragonfly*, DPI website, accessed 2022.

DPI (2022b) *NSW wild dog management strategy 2022–2027* [PDF 564KB], DPI, Sydney.

DPIE (Department of Planning, Industry and Environment, NSW) (2020a) 'Hygiene guidelines: Protocols to protect priority biodiversity areas in NSW from *Phytophthora cinnamomi*, myrtle rust, amphibian chytrid fungus and invasive plants', Environment and Heritage.

DPIE (2020b) 'Wildlife and conservation bushfire recovery, immediate response: January 2020', Environment and Heritage.

DPIE (2021a) *Karst and caves*, Environment and Heritage website, accessed 2022.

DPIE (2021b) 'NSW Wildlife and conservation bushfire recovery: medium-term response plan', Environment and Heritage.

DPIE (2021c) 'NSW Wildlife and conservation bushfire recovery. supplement A – assessing the impact of the bushfires on wildlife and conservation', Environment and Heritage.

DPIE (2021d) 'Priority NSW plants for post-fire field assessment', Environment and Heritage.

Edds G. & Associates (2001) *Kedumba slab hut conservation plan*, report prepared for Sydney Catchment Authority, May 2001.

Gaia Research Pty Ltd (2006) *Targeted searches for tadpoles of the southern barred frog Mixophyes balbus in the Blue Mountains National Park*, draft report prepared for NSW Department of Environment and Conservation, Hurstville.

Greater Sydney Commission (2021) 'Western Sydney district plan: connecting communities', Greater Cities Commission.

GSLLS (Greater Sydney Local Land Services, NSW) (2017) *Greater Sydney regional strategic weed management plan 2017–2022: revised July 2021* [PDF 5.3MB], GSLLS.

GSLLS (2018) *Greater Sydney regional strategic pest animal plan 2018–2023* [PDF 16MB], GSLLS.

Hammill K and Tasker L (2010) *Vegetation, fire and climate change in the Greater Blue Mountains World Heritage Area* [PDF 10MB], NSW Department of Environment, Climate Change and Water, Sydney.

Hammill KA, Tasker EM and Reid J (2010) *Monitoring fire regimes and biodiversity in the Greater Blue Mountains World Heritage Area: final report on Caring for Our Country (TAFA) 2008–2009 Project 5*, NSW Department of Environment, Climate Change and Water, Sydney.

Heritage NSW (2022) *Blue Mountains Walking Tracks*, item 5014091, State Heritage Inventory webpage, accessed 2022.

IUCN (2016) *Wilderness protected areas: management guidelines for IUCN category 1b protected areas* [PDF 6.6MB], IUCN, Switzerland.

IUCN (2020) *World Heritage outlook 3: a conservation assessment of all natural World Heritage sites*, IUCN, Gland, Switzerland, doi:org/10.2305/IUCN.CH.2020.16.en.

Jackson M (2007) *Battleship Tops cultural heritage assessment, Blue Mountains National Park, NSW*, report produced for Gundungurra Aboriginal Heritage Association Incorporated, NSW Department of Environment and Climate Change, Sydney South.

Jamieson R (1964) *Bushwalking and canyoning for senior scouts and others*, Rick Jamieson.

James T (Ed) (1994) *An assessment of the World Heritage values of the Blue Mountains and surrounding plateaus, draft final report*, Royal Botanic Gardens.

Keith DA (2004) *From ocean shores to desert dunes: the vegetation of New South Wales and the ACT*, N*SW Department of Environment and Conservation, Hurstville.*

Keith D (2010) Fire management thresholds for threatened ecological communities in the Blue Mountains City local government area [unpublished report to the Blue Mountains City Council], NSW Department of Environment, Climate Change and Water, Hurstville.

Kenny B, Sutherland E, Tasker E, Bradstock R (2004) *Guidelines for ecologically sustainable fire management* [PDF 1MB], NSW Biodiversity Strategy, NPWS, Sydney.

Kohen JL (2006) *Daruganora: Darug country: the place and the people*, Darug Tribal Aboriginal Corporation.

Lembit R (2020) 'Blue Mountains World Heritage and bushfire', *Nature News*, 64(1).

Low J (1991) *Pictorial memories – Blue Mountains*, Atrand Pty Ltd, Crows Nest.

Mackay J (2006) *Visitor information and interpretation guidelines for walking tracks in the Blue Mountains*, Planning for People, Berridale NSW.

Mackey B, Watson J and Worboys GL of ANU Enterprises Pty Ltd (2010) Connectivity conservation and the Great Eastern Ranges corridor, an independent report to the Interstate Agency Working Group (Alps to Atherton Connectivity Conservation Working Group) convened under the Environment Heritage and Protection Council/Natural Resource Management Ministerial Council [PDF 1.2MB], NSW Department of Environment, Climate Change and Water Sydney.

Macqueen A (2007) *Back from the brink: Blue Gum Forest and the Grose Wilderness*, A Macqueen, Wentworth Falls, NSW.

Macqueen A (2022) 'Bell Range 1823 – What really happened?', *Heritage: Newsletter of the Blue Mountains Association of Cultural Heritage Organisations Inc*, 79, March-April 2022:7–10.

Maxwell K and Keats M (2020) *Splendour Rock: a bush memorial-its story, bushwalking, and bushwalkers of WWII*, Design Portfolio.

Meadows M (2013) 'Reinventing the heights: the origins of rockclimbing culture in Australia', *Continuum*, 27(3):329–346, doi: 10.1080/10304312.2013.772104

Moppett T (1948) 'Dedication of Splendour Rock Memorial, Anzac Day 1948', *The Sydney Bushwalker*, 168, May 1948.

NPWS (National Parks and Wildlife Service, NSW) (1998) *Assessment of the Grose Wilderness*, NPWS, Hurstville.

NPWS (2000a) Forest ecosystems classification and mapping for the southern CRA region volumes 1 & 2: a report undertaken for the NSW CRA/RFA Steering Committee Project number NS 08EH, NPWS, Hurstville.

NPWS (2000b) *Threatened species information: Acacia clunies-rossiae,* Threatened Species Unit, NPWS, Hurstville.

NPWS (2001) *Recovery plan for the Blue Mountains water skink* Eulamprus leuraensis, NPWS, Hurstville.

NPWS (2003a) *The bioregions of New South Wales: their biodiversity, conservation and history*, NPWS, Hurstville.

NPWS (2003d) *Draft recovery plan for the barking owl (*Ninox connivens*)*, NPWS, Hurstville.

NPWS (2003c) *Recovery plan for the yellow-bellied glider (*Petaurus australis), NPWS, Hurstville.

NPWS (2003b) The native vegetation of the Warragamba Special Area, NPWS, Hurstville.

NPWS (2004) 'Blue Mountains National Park fire management strategy', Department of Environment and Conservation (NSW), Environment and Heritage.

NPWS (2006a) 'Kanangra-Boyd National Park fire management strategy', Department of Environment and Conservation (NSW), Environment and Heritage.

NPWS (2006b) *Tracks into history conservation management plan for walking tracks of State significance in the Blue Mountains*, vol. 1 CMP & vol. 2 SHI forms, prepared for NPWS.

NPWS (2007) *Wild horse management plan for the Warragamba Special Area within Blue Mountains National Park* [PDF 1.2MB], Department of Environment and Conservation, Sydney.

NPWS (2011) *Blue Mountains walking track strategy 2011–2016*, NPWS, Hurstville.

NPWS (2021) 'Zero extinctions – national parks as a stronghold for threatened species recovery National Parks and Wildlife Service Threatened Species Framework', Department of Planning, Industry and Environment, Environment and Heritage.

NPWS (2022a) *Aboriginal heritage information management system*, DPE webpage.

NPWS (2022b) 'Fire management manual 2022–23', Department of Planning and Environment, Parramatta.

NPWS (2023a) *Aboriginal joint management model consultation*, Environment and Heritage website.

NPWS (2023b) 'Conservation action plan Kowmung hakea (*Hakea dohertyi*)' Department of Planning and Environment, Environment and Heritage.

NPWS (2024) 'Blue Mountains National Park and Kanangra-Boyd National Park plan of management', Department of Climate Change, Energy, the Environment and Water, Environment and Heritage.

NSW Heritage Office (2008) 'New uses for heritage places: guidelines for the adaptation of historic buildings and sites', Heritage Office, Environment and Heritage.

NSW Scientific Committee (2000) *Anthropogenic Climate Change - key threatening process listing,* Department of Planning and Environment, Parramatta.

NSW Scientific Committee (2002) *Infection of native plants by* Phytophthora cinnamomi – *key threatening process listing*, Department of Planning and Environment, Parramatta.

NSW Scientific Committee (2003) *Infection of frogs by amphibian chytrid causing the disease chytridiomycosis – key threatening process listing*, Environment and Heritage.

NSW Scientific Committee (2004) *Competition and habitat degradation by feral goats – key threatening process listing*, Environment and Heritage.

NSW Scientific Committee (2008) *Forest eucalypt dieback associated with over-abundant psyllids and bell miners – key threatening process listing*, Environment and Heritage.

OEH (2012) *Regional Pest Management Strategy 2012–17, Blue Mountains Region: a new approach for reducing impacts on native species and park neighbours* [PDF 1.7MB], OEH and NPWS, Sydney.

OEH (2013) *Yerranderie Regional Park, Blue Mountains National Park: Heritage Action Statement Yerranderie Township* [unpublished report], OEH, Sydney.

OEH (2014a) 'Gundungurra Indigenous Land Use Agreement', OEH, Environment and Heritage.

OEH (2014b) 'Code of practice for horse riding in parks', OEH, Environment and Heritage.

OEH (2017) 'Declared Aboriginal Places. Guidelines for developing management plans', OEH, Environment and Heritage.

O'Gara E, Wilson B, Howard K and Hardy GEStJ (2005) 'National best practice and risk assessment for the management of *Phytophthora cinnamomi* in natural ecosystems.' *Australasian Plant Conservation*, 34(3):56.

Osborne RAL (2017), 'Hypogene caves of the Tasmanic karsts of eastern mainland Australia', pp:893–911 in A Klimchouk et al. (eds.), *Hypogene karst regions and caves of the world*, Springer International Publishing AG, doi:10.1007/978-3-319-53348-3_61.

Otto Cserhalmi & Partners (2000) *Portions 44 & 45, Carlon's Farm, Green Gully, Conservation Management Plan*, draft report prepared for the National Parks and Wildlife Service, December 2000.

Outdoor Council of Australia (2021) *Australian adventure activity standard and associated good practice guides*, Outdoor Council of Australia, accessed 21 June 2021.

Percival IG (1979) *Geological Heritage of New South Wales Volume I*, report prepared for the Australian Heritage Commission and the Planning and Environment Commission of New South Wales.

Purcell B (2010) 'Order in the pack: ecology of *Canis lupus* dingo in the Southern Greater Blue Mountains World Heritage Area', Doctoral dissertation, University of Western Sydney.

Robinson CJ, Barber M, Hill R, Gerrard E, James G (2016) *Protocols for Indigenous fire management partnerships*, CSIRO, Brisbane.

RFS (Rural Fire Service, NSW) (2021) *Bush fire environmental assessment code* [PDF 3.5MB], NSW RFS.

Rose Deco Planning & Design (2001) *Joe Deacon's House, Yerranderie, Draft Conservation Management Plan*, prepared for Sydney Catchment Authority.

Schon RW (1984) *Geological Heritage of New South Wales Volume III*, report prepared for Australian Heritage Commission & NSW Department of Planning.

Shine R and Fitzgerald M (1989) 'Conservation and reproduction of an endangered species: the broad-headed snake, *Hoplocephalus bungaroides* (Elapidae)', *Australian Journal of Zoology* 25:65–67.

Smith J, Beaver D, Betteridge C (2006) *Tracks into history: conservation management plan for the SHR listed Blue Mountains Walking Tracks*, report prepared for the National Parks and Wildlife Service.

Smith J, Smith P, Smith K (2019) *Native fauna of the Greater Blue Mountains World Heritage Area*, P & J Smith Ecological Consultants, Blaxland NSW.

Smith P and Smith J (2020) 'Future of the greater glider (*Petauroides volans*) in the Blue Mountains, New South Wales', *Proceedings of the Linnean Society of New South Wales*, vol. 142.

Stephens D, Wilton A, Fleming P & Berry O (2015) 'Death by sex in an Australian icon: a continent-wide survey reveals extensive hybridization between dingoes and domestic dogs', *Molecular Ecology*, 24(22).

Stockton E (2009a) 'Archaeology of the Blue Mountains', in *Blue Mountains dreaming: the Aboriginal heritage,* second edition (Eds. E Stockton, J Merriman), pp.41–72, Blue Mountains Education and Research Trust, Lawson, NSW.

Stockton E (2009b) 'New Discoveries' in *Blue Mountains dreaming: the Aboriginal heritage*, second edition (Eds. E Stockton, J Merriman), pp. 9–22, Blue Mountains Education and Research Trust, Lawson, NSW.

Tomkins KM, Humphreys GS, Shakesby RA, Doerr SH, Blake WH and Wallbrink P (2004) 'Mass movement events in the south-west Sydney Basin during the Holocene' in *Regolith* (Ed. IC Roach), pp. 365–369, CRC LEME, Canberra.

Tozer M, Turner K, Simpson C, Keith DA, Beukers P, MacKenzie B, Tindall D, Pennay C (2006) *Native vegetation of southeast of NSW: a revised classification and map for the coast and eastern tablelands*, version 1.0, NSW Department of Environment and Conservation and Department of Natural Resources, Sydney.

Transport for NSW (2021) *Boating handbook*, Transport for NSW, accessed 25 June 2021,

UNESCO (2013) *Greater Blue Mountains Area: statement of outstanding universal value,* UNESCO.

UNESCO (2021a) *What is World heritage?*, UNESCO.

UNESCO (2021b) *Operational guidelines for the implementation of the World Heritage Convention*, UNESCO, Paris.

UNESCO (2022) *The World Heritage Convention*, UNESCO.

Washington, H. and Wray, R. 2015, 'Recognising new values: the geodiversity and geoheritage of the Greater Blue Mountains', Chapter 1 in *Values for a new generation: Greater Blue Mountains World Heritage Area*, Greater Blue Mountains World Heritage Area Advisory Committee, pp 13–49.

WaterNSW and OEH (2015) 'Special areas strategic plan of management 2015', WaterNSW and Office of Environment and Heritage, Environment and Heritage.

WaterNSW (2022) *Neutral or beneficial effect on water quality assessment guideline* [PDF 6.6MB], WaterNSW.

Western Sydney University (2020) *About Greater Western Sydney*, Western Sydney University webpage, Penrith, accessed 15 December 2021.

Wilkinson S, Wallbrink P, Blake W, Doerr SH and Shakesby RA (2006) Impacts on water quality by sediments and nutrients released during extreme bushfires: Report 3: Post-fire sediment and nutrient redistribution to downstream waterbodies, Nattai National Park, CSIRO Land and Water Science Report 64/06, CSIRO, Canberra.

Wilson H (2000a) *Yerranderie Police Station conservation management plan*, prepared for Sydney Catchment Authority, December 2000.

Wilson H (2000b) *Yerranderie Court House conservation management plan*, prepared for Sydney Catchment Authority, December 2000.

Wilson H (2000c) *St Senan's Church, Yerranderie, conservation management plan*, prepared for Sydney Catchment Authority, December 2000.

Woodward E, Hill R, Harkness P and Archer R (Eds) (2020) *Our knowledge our way in caring for Country: Indigenous-led approaches to strengthening and sharing our knowledge*

for land and sea management – best practice guidelines from Australian experiences [PDF 28.3MB], NAILSMA and CSIRO.

Wright I, Reynolds J and Robba L (2022) The stunning recovery of a heavily polluted river in the heart of the Blue Mountains World Heritage area, *The Conversation*.

Wright IA and Burgin S (2009) 'Effects of organic and heavy metal pollution on chironomids within a pristine upland catchment', *Hydrobiologia*, 635:15–25.

More information

- Greater Blue Mountains Area, UNESCO World Heritage Convention webpage
- Local Land Services Act
- National Parks and Wildlife Service (NPWS) website
  - NPWS Ehive Collections Management online database
  - Fire management strategies
  - Public register of leases, easements and rights of way granted under Part 12 of the NPW Act
  - Park management policies
  - Regional pest management strategies
- NSW Environment and Heritage website
  - Biodiversity Conservation Program
  - Saving our Species program
  - Threat abatement plans

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