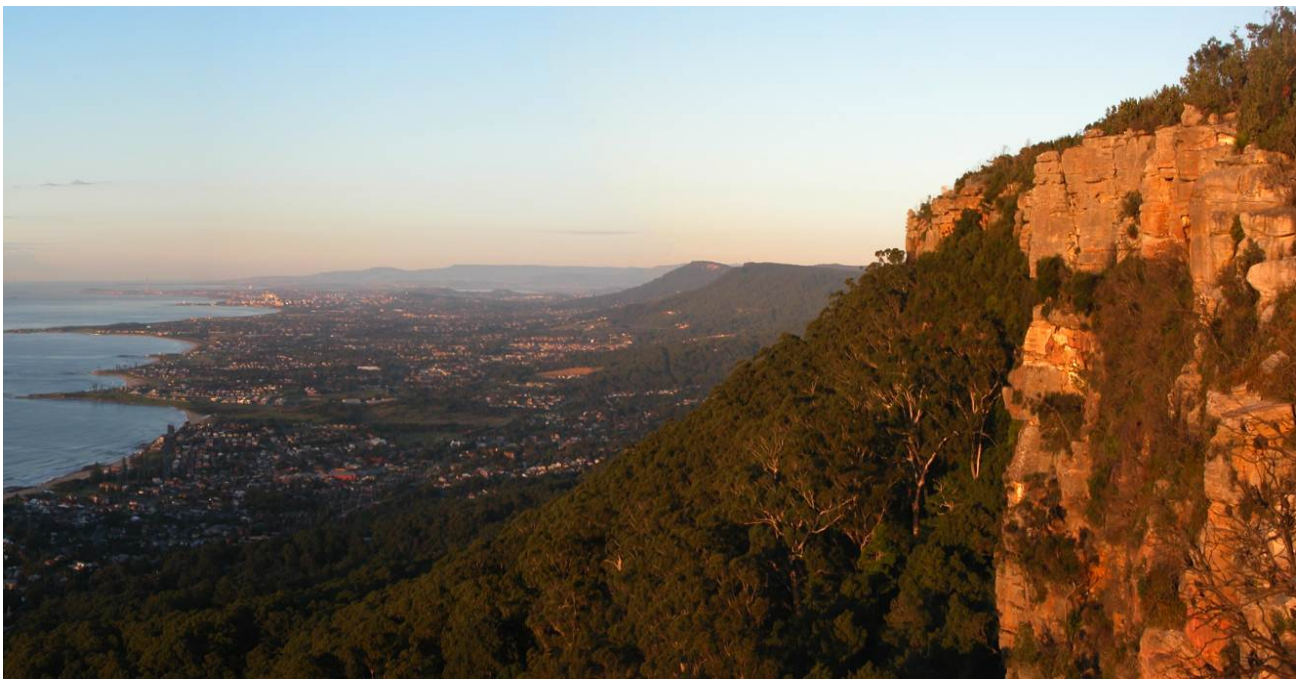
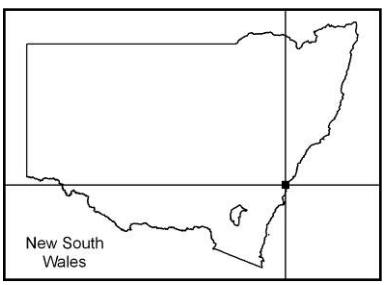
Plan of Management



Illawarra Escarpment State Conservation Area



Illawarra Escarpment State Conservation Area

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NSW National Parks and Wildlife Service

September 2018

Acknowledgements

The NSW National Parks and Wildlife Service (NPWS) acknowledges that the Illawarra Escarpment State Conservation Area is in the traditional country of the Wodi Wodi Aboriginal People of the Dharawal language group.

This plan of management was prepared by staff of the South Coast Branch of the NSW National Parks and Wildlife Service (NPWS), part of OEH.

For additional information or any inquiries about this plan of management or Illawarra Escarpment State Conservation Area, contact the NPWS Illawarra Area Office at Unit G, Ground Floor, 84 Crown Street, Wollongong, or by phone on (02) 4224 4188.

This is the second plan of management written for Illawarra Escarpment State Conservation Area. When adopted, this plan of management will replace the plan of management adopted in 1987.

NPWS would like to thank those people who took the time to make a submission on the draft version of this plan exhibited in 2011.

This plan of management was adopted by the Minister for the Environment on the 17 September 2018.

Front cover image: Looking south along the Illawarra escarpment at sunrise.

Published by:
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ISBN 978-1-925754-67-4
OEH 2018/0505
October 2018

Foreword

The Illawarra Escarpment State Conservation Area protects a geologically and climatologically unique landscape.

The Illawarra escarpment is the dominant landform of the Illawarra region. The Illawarra Escarpment State Conservation Area protects almost one third of this, an area of 2772 hectares, extending for some 40 kilometres between Stanwell Park and Dapto. The park was reserved in 1980 and a first plan of management was prepared in 1987. The park has almost doubled in size since.

It is one of the few places where Australia's Great Escarpment meets the sea. This provides for a wet and productive ecosystem, rich in biodiversity. It protects national and state listed threatened animals and plants and a range of vegetation communities, from upland swamps and heaths on the plateau to subtropical and temperate rainforests on the slopes and in the gullies.

An increased and more complex community patronage necessitates this new plan.

The landscape of the Illawarra Escarpment State Conservation Area is significant to both the Aboriginal and non-Aboriginal communities. Aboriginal people valued the rainforests as a rich source of resources, and still do. After 1849, coal mines spread along the escarpment. Remnant buildings and footprints from that early expansion now provide a link to this history.

More recently recreational activities have expanded and sports such as mountain bike riding are being accommodated in the reserve to promote healthy living and an appreciation of nature and history.

The plan contains several actions to protect our natural environment, including protection of threatened species and communities, targeted threatened species fauna surveys, control of pest plants and animals, and fire management to protect biodiversity. The plan also provides opportunities for scenic viewing, bushwalking, cycling and horse riding.

This plan of management establishes the scheme of operations for the Illawarra Escarpment State Conservation Area. In accordance with section 738 of the *National Parks and Wildlife Act 1974,* I cancel the provisions of the 1987 plan of management and hereby adopt this plan of management.

Gabrielle Upton MP

Minister for the Environment

Contents

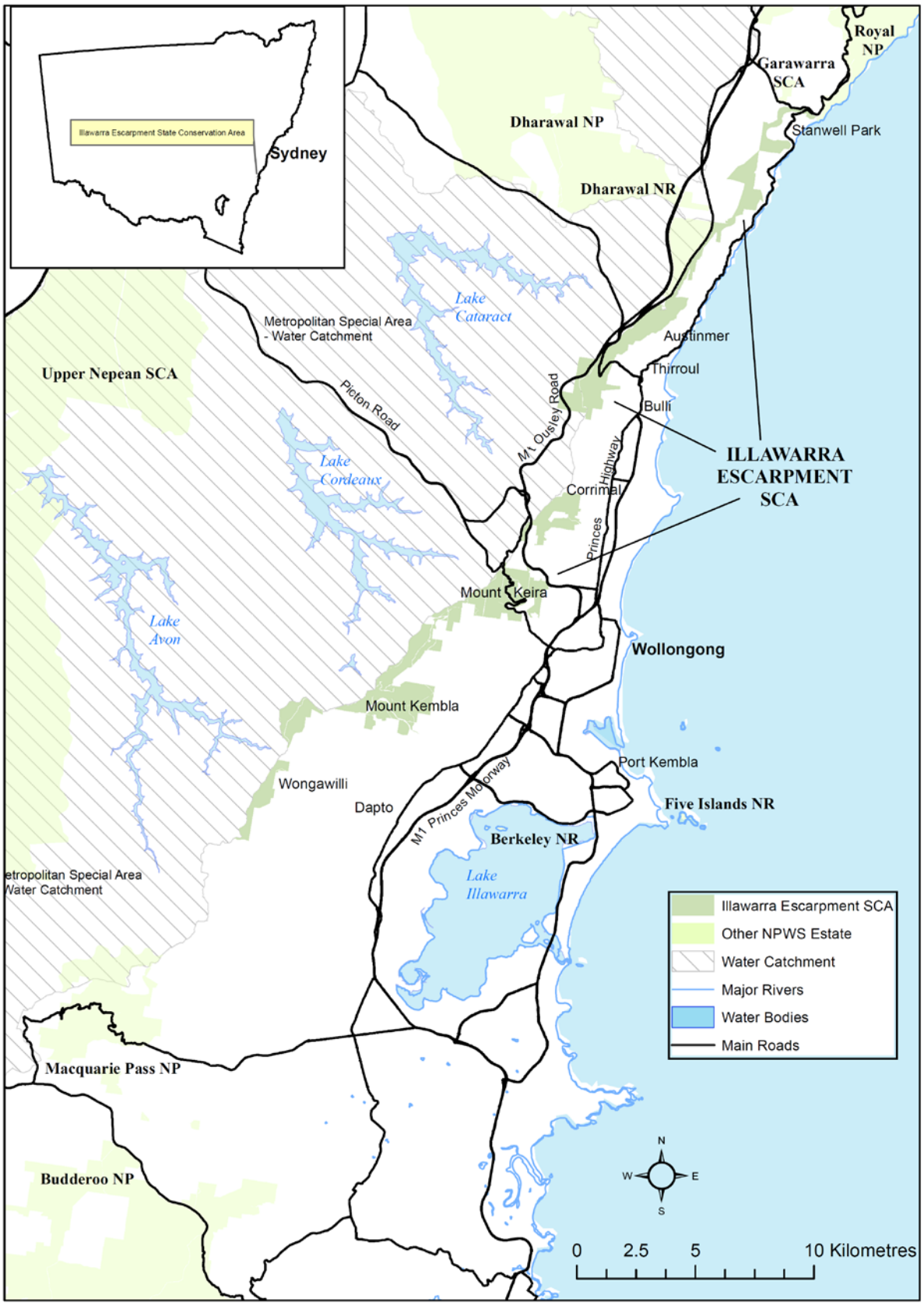

Figure 1: Location map

1. Location, reservation and regional context

1.1 The Illawarra escarpment

The Illawarra escarpment is the dominant landform and an iconic feature of the Illawarra, providing a spectacular natural backdrop to the adjacent urban areas. It is located approximately 60 kilometres south of Sydney (see Figure 1) and spans three local government areas (Wollongong, Shellharbour and Kiama). The escarpment extends from Royal National Park south for approximately 50 kilometres to Budderoo National Park and Barren Grounds Nature Reserve.

The escarpment is a biodiversity 'hot-spot' and many of its plant communities are rare or restricted to the Illawarra. Its landscape is significant to both Aboriginal and non-Aboriginal communities. Mount Keira and Mount Kembla are especially important for Aboriginal and European cultural heritage. The escarpment has also largely determined the region's economic development and patterns of land use and continues to shape the region's weather.

The unique cultural and natural assets of the escarpment present great opportunities to enhance the region's economy and quality of life. The escarpment is, however, subject to significant influences that threaten its values and pose great challenges for its sustainable management.

1.2 Illawarra Escarpment State Conservation Area

Illawarra Escarpment State Conservation Area (referred to in this plan as the park) occupies nearly 30% of the Illawarra escarpment and a sliver of the eastern edge of the Woronora Plateau. It occupies an area of 2772 hectares.

The park comprises six separate sections extending over approximately 40 kilometres, from Stanwell Park in the north to West Dapto in the south. The six sections are in the localities of Stanwell Park, Austinmer–Bulli, Corrimal, Mount Keira, Mount Kembla and Wongawilli.

The park was first reserved in 1980 as the Illawarra State Recreation Area following the donation of 1503 hectares to the NSW Government by Australian Iron and Steel Pty Ltd (now BHP Billiton) (see Figure 2). Terms of the donation agreement that remain relevant are:

- The park is limited to a maximum depth of 15.24 metres below the natural ground surface.
- Three non-government organisations (Scouts Australia NSW, Girl Guides NSW & ACT, and the Australian Rhododendron Society) are guaranteed continued rights of occupancy at three sites within the park.
- BHP Billiton retains the following rights on the donated land:
  - continuation of existing uses and mining-related infrastructure
  - the right to open new mines or install new equipment, roads, railways and other services related to its operations
  - unrestricted right of access to existing or new installations for maintenance purposes, over existing routes or over new routes agreed to by the Minister.

The *National Parks and Wildlife (Adjustment of Areas) Act 2001* changed state recreation areas, as a category of reserve, to state conservation areas.

Since the initial reservation, substantial additions, including further donations by BHP Billiton, have increased the park to its current size. Additions in 2003 north of Bulli added an almost continuous corridor of land north to Royal National Park and adjacent to Dharawal Nature Reserve and Dharawal National Park.

An area at Farmborough Heights containing the remaining Port Kembla No. 2 Mine buildings and houses, and access to this site via the Farmborough Road Trail, are vested in the Minister administering the *National Parks and Wildlife Act 1974* (NPW Act) for the purposes of Part 11 of that Act. This area is not part of the park, but its management is subject to this plan of management and the National Parks and Wildlife (NPW) Regulation.

The escarpment between the park sections consists of private land and land managed by Wollongong City Council. Land uses include recreation reserves, private dwellings and coal mining operations. To the west of the escarpment most of land is managed by WaterNSW for the provision of water to Sydney and the Illawarra regions (the Metropolitan Special Area). Wollongong and its suburbs lie adjacent to the eastern boundary of the park.

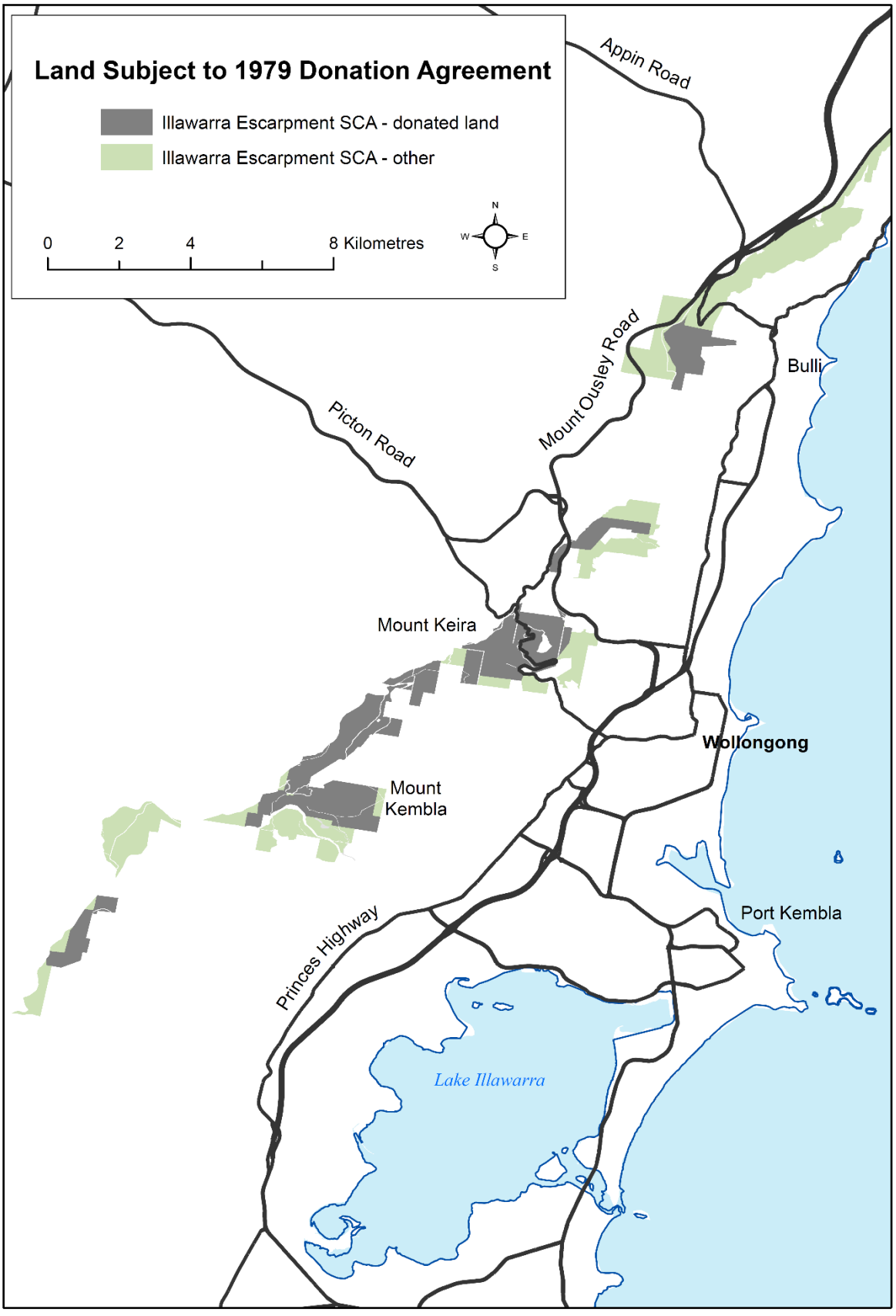

Figure 2: Land subject to the 1979 donation agreement

2. Management context

2.1 Legislative and policy framework

State conservation areas in New South Wales are managed within a legislative and policy framework, primarily the NPW Act, the National Parks and Wildlife Regulation, the *Biodiversity Conservation Act 2016* (BC Act) and the policies of the NSW National Parks and Wildlife Service (NPWS). NPWS policies arise from this legislative framework as well as internationally accepted principles of park management. They relate to nature conservation, cultural heritage conservation, recreation, fire management, commercial use, research and the provision of information. The matters to be considered in the preparation of a plan of management are listed in section 72AA of the NPW Act.

Other legislation may also apply to management of the park. In particular, the *Environmental Planning and Assessment Act 1979* (EPA Act) requires the assessment and mitigation of the environmental impacts of any works proposed in this plan. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) may also apply in relation to actions that affect matters of national environmental significance, such as migratory and threatened species listed under that Act. The NSW *Heritage Act 1977* may apply to the excavation of known archaeological sites or sites with potential to contain historical archaeological relics.

An area of the park west of the Upper Escarpment Trail above Bulli was reserved in 2012 and is part of the Metropolitan Special Area managed by WaterNSW. The purposes of special areas under the *Water NSW Act 2014* (WNSW Act) are to protect the quality of stored waters for drinking purposes and to maintain the ecological integrity of their catchments.

A *Special Areas Strategic Plan of Management 2015* (WaterNSW & OEH 2015) has been prepared to cover all special areas declared under the WNSW Act. It sets out principles and objectives for management of catchment special areas in New South Wales which take into account the complementary purposes of protecting water quality and conserving natural and cultural heritage values. It also outlines processes for WaterNSW and NPWS to jointly develop management priorities and work programs. A Service Level Agreement articulates the mutual and shared responsibilities of the two agencies across jointly managed special areas.

State Environmental Planning Policy (Drinking Water Catchment) 2011 applies where the Metropolitan Special Area and the park overlap. Under this planning policy, a public authority must, before it carries out or consents to any activity in the catchment, consider whether the activity would have a neutral or beneficial effect on water quality.

A plan of management is a statutory document under the NPW Act. Once the Minister has adopted a plan of management, the plan must be carried out and no operations may be undertaken within the area covered by the plan except in accordance with the plan. The plan will also apply to any future additions to the Illawarra Escarpment State Conservation Area. Should management strategies or works be proposed in the future that are not consistent with the plan, an amendment to the plan will be required.

2.2 Management purposes and principles

State conservation areas are reserved under the NPW Act to protect and conserve areas that:

- contain significant or representative ecosystems, landforms or natural phenomena or places of cultural significance
- are capable of providing opportunities for sustainable visitor or tourist use and enjoyment, the sustainable use of buildings and structures, or research
- are capable of providing opportunities for uses permitted under other provisions of the NPW Act.

Under the NPW Act (section 30G), state conservation areas are managed to:

- conserve biodiversity, maintain ecosystem function, protect natural phenomena and maintain natural landscapes
- conserve places, objects and features of cultural value
- provide for the undertaking of uses permitted under other provisions of the NPW Act (including uses permitted under section 47J such as mineral exploration and mining), having regard to the conservation of the natural and cultural values of the state conservation area
- provide for sustainable visitor use and enjoyment that is compatible with the conservation of the area's natural and cultural values
- provide for the sustainable use (including adaptive re-use) of any buildings or structures or modified natural areas having regard to the conservation of the state conservation area's natural and cultural values
- provide for appropriate research and monitoring.

Land is reserved as a state conservation area primarily where mineral values do not allow for reservation as another category. The NPW Act requires a review of the classification of state conservation areas every five years in consultation with the Minister administering the *Mining Act 1992*. The review considers whether each state conservation area should or should not be reserved as either a national park or nature reserve. Reviews of the Illawarra Escarpment State Conservation Area reservation status were undertaken in 2008 and 2013.

The 2013 review found that exploration and mining titles apply in the park, which means it cannot be reserved as a national park or nature reserve under the NPW Act and must remain a state conservation area to allow for exploration or mining, subject to environmental assessment.

Exploration licences and assessment leases may be granted in state conservation areas without the concurrence of the Minister administering the NPW Act. However, the Minister's approval must be obtained before any rights under that lease or licence can be exercised. Likewise, the concurrence of the Minister administering the NPW Act must be obtained before any mining lease is issued. In the case of exploration licences and other prospecting titles, an access agreement under the Mining Act is also required between the titleholder and NPWS in order for the titleholder to conduct prospecting operations within a state conservation area.

Water catchment special area

Parts of the western fringes of the park, including an area west of the Upper Escarpment Trail west of Bulli that was reserved in 2012, lie within the Metropolitan Special Area. The purposes of special areas under the WNSW Act are to protect the quality of stored waters for drinking purposes and to maintain the ecological integrity of their catchments. The Metropolitan Special Area is listed in Schedule 1 of the Water NSW Act, a classification that prescribes stringent controls for the protection of the quality of stored drinking water, including the exclusion of general public access. The *Special Areas Strategic Plan of Management 2015* (WaterNSW & OEH 2015) also applies.

In addition to setting out the principles and objectives for management of catchment special areas in NSW, the *Special Areas Strategic Plan of Management* also outlines processes for WaterNSW and NPWS to jointly develop management priorities and work programs. A Service Level Agreement articulates the mutual and shared responsibilities of the two agencies across jointly managed special areas.

WaterNSW has a statutory role in management of those parts of the park that are within the Metropolitan Special Area and must give its concurrence for the granting of any lease, licence, easement or right of way.

2.3 Regional and local planning framework

The primary environmental planning instrument for the Wollongong Local Government Area is the *Wollongong Local Environmental Plan 2009* (NSW Government 2009). Council consent is not required, however, for developments within the park, with NPWS the approving authority for all activities within lands reserved under the NPW Act.

The Commission of Inquiry into the Long-Term Planning and Management of the Illawarra Escarpment (conducted 1998–99), concluded that the planning and management of the escarpment, including protection of its catchment, ecology and visual and heritage significance, should be done by treating the escarpment as a single entity. In 2006 Wollongong City Council prepared the *Illawarra Escarpment Strategic Management Plan* (WCC 2006), which drew upon a range of studies such as the NPWS bioregional assessments for the Wollongong Local Government Area (NPWS 2002a, 2002b). The updated *Illawarra Escarpment Strategic Management Plan 2015* (WCC 2015) provides a long-term vision for the protection of the escarpment and an informed basis for its sustainable management. The principles and strategic directions embodied in the *Illawarra Escarpment Strategic Management Plan* have been formally adopted as NSW Government policy through the *Illawarra Shoalhaven Regional Plan* (NSW DPE 2015) and the Wollongong Local Environmental Plan. The direction and approach of both plans are incorporated in this plan of management.

The park coincides with the ‘core escarpment’ and ‘biophysical support’ zones identified in the *Illawarra Escarpment Strategic Management Plan*; all lands within the park are zoned E1: National Park & Nature Reserve under the Local Environmental Plan.

The *Illawarra Biodiversity Strategy* (WCC 2011) provides a regional and coordinated approach to biodiversity conservation across the Wollongong, Shellharbour and Kiama local government areas. It identifies principles and priorities for biodiversity conservation, including areas for restoration work adjacent to the park.

3. Significance and key directions

3.1 Statement of significance

The key values of Illawarra Escarpment State Conservation Area are summarised below.

Biological values

- The park has high biodiversity, with:
  - 22 vegetation communities, which represents 40% of the terrestrial vegetation communities identified in the Illawarra
  - four endangered ecological communities, and several communities that are rare or poorly conserved, or restricted to the Illawarra
  - nine threatened plant species, of which six are listed under the EPBC Act and four are restricted to the Illawarra
  - 21 threatened native animals.
- The Illawarra escarpment contains the most extensive area of rainforest in the Sydney Basin Bioregion (NPWS 2002a) and is one of only six concentrations of rainforest in New South Wales (Floyd 1990). The park conserves a third of the escarpment's rainforest within the Wollongong Local Government Area and most of the region's rainforest types.
- The park spans an ecological transition zone near Mount Keira and Mount Kembla. The zone contains the northern or southern distributional limits of many coastal plant communities and wildlife species (NPWS 2002a).
- Much of the park is high-quality core habitat for threatened animals.
- The park:
  - is part of a chain of conservation reserves that form the Illawarra Moist Forest Corridor, extending from Royal National Park in the north to the Shoalhaven River in the south
  - is part of an east–west corridor of catchments and NPWS reserves that extends from the Illawarra coast west to the Blue Mountains
  - provides refuge for species that might be affected by environmental disturbance (development, fire, climate change) in adjacent areas.

Landscape values

- The park landscape is a unique visual feature of great scenic and economic importance to the Illawarra, providing a spectacular backdrop that enhances the amenity of the urban areas.
- It is listed as a 'Scenic Landscape of Statewide Significance' on the Register of the National Trust of Australia (NSW).

Cultural heritage values

- The park contains:
  - landscape features of spiritual significance to the Aboriginal community, and which feature in legends and teaching stories
  - places and objects of Aboriginal cultural importance, including traditional travelling routes, rock engravings and artefacts

- continuing cultural connections for the local Aboriginal community.

- The park is crossed by historic roads and trails used by early European settlers, some of which were convict constructed.
- It contains important coalmining sites, buildings and relics. The Mount Kembla Mine was the site of Australia's worst industrial disaster, when 96 men and boys were killed in 1902. The mine was also important in the development of coalmining in New South Wales and the catalyst for the development of Port Kembla. The managers' houses of the Port Kembla No. 2 Mine are a rare example of a house and garden cultural landscape designed by Edna Walling. The pit-pony stables at both mines may be the only standing pit-pony stables in New South Wales and possibly Australia (OEH 2012a).
- The park contains the ruins of several early farms and dwellings.
- It has several walking tracks, lookouts and a scout camp that date from the early 20th century.
- Several sites are listed on state and local heritage inventories.

Recreational, research and educational values

- The park provides a significant recreational resource for the local community, with easy access from adjacent urban areas, allowing a sense of solitude and remoteness close to the facilities afforded by the city of Wollongong.
- It provides walking opportunities for visitors of all abilities via a comprehensive and integrated network of tracks, which in turn are integrated with facilities outside the park.
- The park is adjacent to well-developed main roads and public transport corridors that link Sydney, the Illawarra and the South Coast and Southern Tablelands, and which provide ready access from these regions for nature-based and cultural heritage tourism.
- The wide range of natural and cultural attributes, and close proximity to educational institutions, including the University of Wollongong, offer unique opportunities for education and research.

Water quality values

- Some parts of the park along the western boundary are within the upper catchment of the Metropolitan Special Area. Runoff from these areas drains, via upland swamps and pristine drainage lines, to water storages that supply essential drinking water for Wollongong and Sydney.

3.2 Management directions

The park has significant values but also several challenging management issues including ongoing geological instability; weed infestations; increasing numbers of feral deer; numerous historic buildings and features; dissection by utility, telecommunications and transport corridors; recreational pressure from Wollongong and its suburbs and boundary issues such as encroachments and dumping. Further, the distribution of the park along the escarpment is discontinuous, which could affect the long-term viability of the park to maintain its full range of values.

In addition to the general management purposes and principles for state conservation areas (see Section 2.2), the following specific management directions apply to the Illawarra Escarpment State Conservation Area:

- Protect the natural character, biodiversity and scenic qualities of the park.
- Improve the connectivity of the sections of the park and connectivity of the park to other conservation reserves.
- Seek holistic management of the escarpment across land tenures to protect its important values.
- Conserve significant cultural heritage features and facilitate ongoing use of suitable sites.
- Provide for sustainable use that is compatible with the park's values and management purposes, integrated with facilities located on adjacent lands.
- Recognise and respond to the proximity of urban populations, minimise conflict between park users and engage with new user groups.
- Promote understanding and appreciation of the park's natural and cultural values, support for conservation and minimal impact by visitor use and behaviour.

The following sections detail the parks values and issues and set out strategies for addressing them.

4. Values

This plan aims to conserve both the natural and cultural values of the park. The location, landforms and plant and animal communities of an area have determined how it has been used and valued by Aboriginal and non-Aboriginal people. Values may be attached to the entire landscape or to components of it, such as the plant and animal species used by Aboriginal people. To make this plan clear and easy to use, various aspects of natural heritage, cultural heritage, threats and ongoing use are dealt with individually, but their interrelationships are recognised and underlie this plan.

4.1 Landform, geology, hydrology and soils

Geodiversity is the natural diversity of rocks, minerals, fossils, soils and landforms, and the processes that have shaped these features over time. The Illawarra escarpment is an iconic geomorphological feature that dominates the Illawarra landscape. A detailed rock sequence is revealed on the escarpment, making the view from its northern end an item of geological heritage (Schon 1984).

Landform and geology

Two of the Illawarra's three major landforms – the escarpment and the plateau – are represented in the park. The escarpment meets the plateau at a height of 300 metres at Bald Hill (Stanwell Tops) and 550 metres at the southern end of the park. It curves around the third major landform – the coastal plain – meeting the coast at Stanwell Park in the north and Kiama in the south. As stated in Section 3.1, the escarpment has high scenic value.

The Illawarra escarpment is part of Australia's Great Eastern Escarpment but is unusually close to the sea in the Wollongong area. It consists of high cliffs above steep slopes, ridges and gullies. There are only small areas of level ground.

The escarpment, and adjacent Woronora Plateau, are part of the Sydney Basin, a large geological depression that filled with swamp and river sediments during the Permian and Triassic periods (approximately 260–180 million years ago). The resultant sedimentary rocks were subsequently uplifted, tilted and eroded to form the present-day landscape. The horizontal beds that comprise the escarpment and plateau dip to the north-west.

The plateau sits on Hawkesbury Sandstone interbedded in places by shale deposits. The plateau rim and escarpment cliffs consist of massive beds of Hawkesbury Sandstone that are more resistant to weathering than the layers below. Deep vertical cracks (joints) penetrate the sandstone. Jointing is a natural outcome of the geological uplifting of the sandstone but is exacerbated to some extent because of subsidence caused by coal mining.

Softer sandstones, shales and claystones of the Narrabeen Group form steep vegetated slopes beneath the cliffs. There are narrow claystone benches in some places, where weaker rocks overlie resistant ones. Further downslope are shale beds, soft sandstones, conglomerate and coal seams belonging to the Illawarra Coal Measures. Volcanic sills (Berkeley Latite) penetrate the sedimentary geology at some locations, such as at Farmborough Heights and Wongawilli.

The geomorphological processes that formed the escarpment are ongoing. Weathering of the shales undermines the sandstone, causing rock falls that generate the massive cliffs that dominate the escarpment landscape. The relatively high rainfall (1600 mm per year) exacerbates the inherent instability of the escarpment. Runoff, groundwater and the heavy jointing in the sandstone cause sections of the cliff line to mobilise and collapse. The debris forms a thick mantle of talus, or colluvium, on the escarpment slopes. This material is also prone to mass movement, particularly during heavy rainfall.

The escarpment generates high rainfall and fog by forcing warm moist coastal air to rise and condense through altitudinal cooling, a process known as orographic precipitation. It also shelters the slopes from drying westerly winds. These conditions provide a microclimate that supports the extensive rainforest vegetation of the escarpment and increases the rate of geomorphological processes. Sites on the steep slopes receive little winter sunshine, remaining relatively cold throughout the day.

Soils

Soils on the plateau are typically sandy, shallow and low in organic content and plant nutrients, as they are derived from the underlying quartz sandstone. These soils are highly erodible because of their unconsolidated nature. In poorly drained depressions, upland swamps have developed deeper soils with a high organic content. This organic matter acts to bind and stabilise the soil, preventing erosion. Areas of plateau soils that are derived from remnant shale caps are significantly higher in plant nutrients than those from sandstone.

The soils on the escarpment slopes are derived from the weathered shales and claystone and colluvium from landslides. They are typically nutrient-rich but rated an extreme erosion hazard and prone to mass movement (Hazelton & Tille 1990) owing to the high rainfall and steep gradients. Vegetation and plant roots enhance soil stability on the escarpment slopes, particularly in rainforests, where the dense root systems are close to the surface. The retention of vegetation is critical to the retention of soils and land stability.

Hydrology

The cliff line of the escarpment largely follows the catchment boundary for the catchments feeding east and west. The exception is, some small east-facing valleys in the plateau above the escarpment south of Mount Kembla and north of Scarborough.

The catchments draining west feed into the Upper Nepean and Woronora rivers, which supply drinking water for Sydney and the Illawarra. Parts of the western fringes of the park lie within the Metropolitan Special Area, which protects these catchments (see Figure 3 and Section 2.2).

The catchments draining east include several creeks that pass through the park to the coast. These are essential for the continuity and health of the moist forests and other ecosystems in the park.

The heads of the catchments are studded with numerous wetlands that perform important hydrological functions. Their deep, spongy soils absorb and filter large volumes of surface water and ground water, before slowly releasing it into the catchments. The underlying bedrock also absorbs and filters large quantities of groundwater. Porous layers, such as sandstone and coal seams, provide a sustained release of groundwater for months following rain.

Because the catchments are largely undeveloped, they are in relatively good condition and clean overall. Clean catchments are vital for conservation of sensitive vegetation communities and animals and are increasingly rare and valuable in the Sydney Basin. Intact catchments are also valuable as natural resources and in times of drought.

Issues

- There is incomplete knowledge of the park's geodiversity and what is needed to manage it. In addition, the park's geoheritage values (features that have special meaning to communities and cultural groups) are poorly understood.
- Erosion and sedimentation are occurring as a result of inappropriate track creation through activities such as downhill cycling and the use of trail bikes (see Section 4.6).

- Former land use before reservation of the park has left a number of polluted or contaminated sites. Examples include domestic waste dumps, coal-wash emplacements and mine drainages. These disturbed sites may pose health and safety issues for park users.
- Roads, railways, waste-water, stormwater, dumping, mining and coal-seam gas extraction all present threats to water quality.
- Unauthorised water extraction occurs in some locations.
- During the recent past, landslides and large rockfalls have occurred at a number of locations throughout the park and threatened both historic sites and recreation facilities. Geological instability and landslips have necessitated the implementation of measures to protect visitor safety, such as the closure of some lookouts and walking tracks and restrictions on the use of some trails and sites in the park. Major reconstruction and stabilisation projects have been undertaken or are required at some locations.
- NPWS has conducted geotechnical assessments of all public use areas considered to be geotechnically unstable. Areas identified as at particularly high risk from potential landslip following high-level rainfall events include the Mount Keira Scout Camp and the northern end of the Mount Kembla Ring Management Trail, where there is potential risk to a cottage outside the park. A geotechnical risk management occupancy plan has been developed for these sites that includes evacuation during high rainfall periods.
- Past land uses have resulted in cleared and disturbed areas that may exacerbate slope instability. Coal-wash emplacements from former mining activities are especially prone to landslip owing to their unconsolidated nature and because the dumps are typically located on steep slopes. In the past, coal mines have been closed or added to the park without adequate environmental rehabilitation. NPWS has an opportunity to participate in the determination of appropriate rehabilitation measures through membership of the Illawarra Coal Mining Interagency Group.
- Use of vehicles on management trails during heavy rainfall could cause adverse environmental impacts such as soil erosion and sedimentation.
- Park management activities and structures, and activities on adjacent land, have the potential to adversely affect landscape qualities.

Desired outcomes

- The park's geodiversity and scenic qualities are protected and maintained.
- Hazards caused by land instability are managed as far as possible to prevent landscape degradation and minimise risks to visitors, staff and cultural heritage features.
- Soil loss is minimised.
- Water flows in the park are maintained in their natural state.
- Water quality is protected or improved.
- The upland swamps are protected.

Management response

4.1.1 Conduct all activities in a manner that ensures the landscapes, geodiversity and scenic qualities of the park are protected and maintained. Minimise the impacts of developments in the park on the scenic views and the natural skyline.

4.1.2 Consider the inherent instability of the escarpment landform and the erodibility of the park's soils in all aspects of management. Identify hazards resulting from land instability and soil erosion as needed and determine appropriate management. Actions may include monitoring, warning signage, remedial works, temporary or permanent closure of an area to the public, or relocation of visitor facilities. Work with licensees and other relevant parties to implement risk management occupancy plans where prepared.

4.1.3 Engage as needed with other authorities, landowners, licensees and user groups to address matters that affect landscapes, scenic values, land stability or soil conservation in the park.

4.1.4 Work with the Illawarra Coal Mining Interagency Group, the Department of Planning and Environment – Resources and Energy and other mining interest groups to assess and manage coal-wash emplacements and other areas affected by mining activities.

4.1.5 Conduct all activities in the park in a manner that ensures that its catchments and water quality are protected and maintained.

4.1.6 Avoid activities that threaten the soil conservation or catchment functions of the upland swamps.

4.1.7 Do not allow water collection from within the park unless it is authorised under an existing lease or licence. Identify and liaise with relevant parties to stop unauthorised water extraction.

4.1.8 Avoid vehicle use on management trails during periods of heavy rainfall.

4.1.9 Close and rehabilitate disturbed areas and unauthorised or unnecessary tracks and trails (those not shown on the plan of management maps).

4.1.10 Engage with other authorities and landowners as needed to address issues that affect catchments and water quality in the park.

4.1.11 Encourage research on the geodiversity and geoheritage values of the Illawarra escarpment and adjacent plateau within the park, to identify significant geological and geomorphological features.

4.2 Native plants

The park has high plant biodiversity. Twenty-two vegetation communities have been identified, of which half are of conservation significance. The communities are listed in Appendix 1.

Dry open forests, heaths and upland swamps dominate the plateau. The mainly north-westerly aspect of the plateau creates a relatively dry environment, except in areas of poorly drained soils and sheltered gullies. The vegetation contains a high proportion of sclerophyllous species that are adapted to high frequency fire regimes.

The forest and woodland communities on the plateau contain a wide range of tree species but are dominated by scribbly gums (*E. racemosa* and *E. haemastoma*), silvertop ash (*E. sieberi*), Sydney peppermint (*E. piperita*), red bloodwood (*Corymbia gummifera*), smooth-barked apple (*Angophora costata*) and turpentine (*Syncarpia glomulifera*). The upland swamps are a complex of shrubs, sedges and herbaceous species, including heath-leaved banksia (*Banksia ericifolia*), finger hakea (*Hakea dactyloides*), *Leptocarpus tenax*, *Schoenus*

brevifolius, *S. paludosus*, red-fruit saw-sedge (*Gahnia sieberiana*), *Empodisma minus*, pouched coral fern (*Gleichenia dicarpa*) and scrambling coral fern (*G. microphylla*), with many additional species.

Tall moist forests and rainforests dominate the escarpment slopes and benches, where the escarpment generates high rainfall and afternoon shading that favours these vegetation types. Moist open forests occupy the north-facing slopes and ridges, which are more exposed to the sun, wind and bushfires. The dominant species are blackbutt (*E. pilularis*), southern blue gum (E*. saligna* x *E. botryoides*), coast white box (*E. quadrangulata*), gully gum (*E. smithii*), yellow stringybark (*E. muelleriana*) and turpentine.

A north–south transition zone between Escarpment Moist Blue Gum Forest and Moist Coastal White Box Forest communities occurs around Mount Keira and Mount Kembla.

Rainforests generally occur on the heavily shaded benches, slopes and gullies where they are sheltered from desiccation and fire. In general, subtropical rainforest is found on the lower slopes and temperate rainforest species typify the upper slopes and gullies. The subtropical rainforest supports a high diversity of canopy species including giant stinging tree (*Dendrocnide excelsa*), sassafras (*Doryphora sassafras*), native tamarind (*Diploglottis australis*), red cedar (*Toona ciliata*), small-leaved fig (*Ficus obliqua*) and Moreton Bay fig (*F. macrophylla*). Warm temperate rainforest is dominated by sassafras and coachwood (*Ceratopetalum apetalum*), commonly with lilly pilly (*Syzygium smithii*).

The uniqueness of the vegetation on the escarpment is an outcome of its altitudinal gradient, proximity to the coast, high rainfall, fertile soils and warm temperate climate – a combination that is unique on the east coast of New South Wales.

Significant communities and species

Eleven of the parks 22 vegetation communities have been identified as either threatened, rare, poorly conserved or restricted to the Illawarra (see Appendix 1). Eight correspond to the four endangered ecological communities (EECs) listed under the BC Act recorded in the park. The four EECs are:

- Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion, occurring on sandstone–shale transitional soils on the plateau between Bulli and Helensburgh.
- Illawarra Subtropical Rainforest in the Sydney Basin Bioregion, typically occurring as isolated pockets on a narrow band of nutrient-rich volcanic soils on the escarpment foothills at Mount Keira, Mount Kembla and Wongawilli, but also north of Wollongong on escarpment benches.
- Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion, occurring in the lower foothills at Mount Kembla and Wongawilli, on transitional sedimentary–volcanic soils.
- Coastal Upland Swamp in the Sydney Basin Bioregion, occurring on the plateau in the Bulli, Maddens Plains and Mount Kembla area, primarily on impermeable sandstone plateaus in the headwater valleys of streams on sandstone benches with abundant seepage moisture.

The other three communities are rare or poorly reserved in the Sydney Basin Bioregion or are restricted to the Illawarra (see Appendix 1). Rare plant communities are especially prevalent on the escarpment at Wongawilli, Mount Keira Scout Camp, Tarrawanna, and from Bulli to Stanwell Park.

Conservation of rainforests is a high priority because they are rare, restricted in area and provide core habitat for a number of significant species.

The wetland communities on the plateau form part of the Coastal Upland Swamp endangered ecological community (see Appendix 1) and have very high species diversity. Those between Scarborough and Stanwell Tops are part of a significant group of wetlands on the Woronora Plateau, which together comprise the single greatest concentration of upland swamps in mainland Australia. More than 80% of the mapped area of the threatened ecological community Coastal Upland swamp occurs on the Woronora Plateau (NSW SC 2012). However, most conservation reserves that contain upland swamp communities support only a few hectares of these communities, so it is important to adopt a landscape approach to their conservation.

The Maddens Plains area of the park has a particularly high plant biodiversity owing to the mix of soil types and vegetation structure. Approximately 460 native species have been recorded within an area of 60 hectares (Miller 2011).

Almost all the native plant communities in the park are assessed as having primary conservation value as core habitat for threatened species (NPWS 2003).

The nine threatened plant species recorded in the park are listed in Appendix 2. These comprise six species listed as endangered and three as vulnerable under the Biodiversity Conservation Act. Three species, Illawarra socketwood (*Daphnandra johnsonii*), prickly bush-pea (*Pultenaea aristata*) and Sublime Point pomaderris (*Pomaderris adnata*) are restricted to the Illawarra. Sublime Point pomaderris occurs only on the plateau north of Bulli Tops and a substantial proportion of its population is within the park.

A further 14 species occurring in the park are listed as rare or threatened Australian plant species (Briggs & Leigh 1996; see Appendix 2).

Strategies for the recovery of threatened species, populations and ecological communities have been set out in a statewide *Biodiversity Conservation Program* (OEH 2018a, formerly known as the Threatened Species Priorities Action Statement). These actions are currently prioritised and implemented through the *Saving our Species* program which aims to maximise the number of threatened species that can be secured in the wild in New South Wales for 100 years (OEH 2016).

Individual recovery plans may be prepared for nationally listed threatened species and recovery plans have been prepared for some species listed in New South Wales.

Threat abatement actions for the threatened species and communities in the park include further survey and monitoring, bush regeneration programs and protection from hydrological changes and from accidental damage during road maintenance.

Issues

- The upland swamps are potentially at risk from mining subsidence, climate change, disturbance and changes in fire regimes.
- Roads and corridors for utilities are ongoing causes of opening of the canopy and creating conditions favourable to weeds (see Sections 5.1, 5.3 and 6).
- Significant areas of the park have been subject to past disturbance and clearing from mining and associated activities, agriculture and other uses. Some areas are regenerating but other areas have significant weed growth (see Section 5.1). Trees growing on coal-waste emplacements are frequently insecure.

- Significant plant communities and species on the escarpment are potentially at risk from landslip (see Section 4.1), hydrological changes resulting from adjacent development (see Section 4.1), weed invasion (see Section 5.1), pests such as deer (see Section 5.1), inappropriate fire regimes (see Section 5.2), unauthorised recreational activities (see Section 4.6) and climate change (see Section 5.4). Management responses for these issues are discussed in the respective sections of the plan referenced.
- Clearing and development on neighbouring land, especially on the lower slopes of the escarpment, could threaten vegetation connectivity and therefore biodiversity in the park (see Section 5.3).

Desired outcomes

- Plant biodiversity (species, including genetic diversity, populations, communities and their habitats) is maintained and the condition of the vegetation of the park is enhanced where possible.
- Populations of threatened plant species, biogeographically significant species, endangered ecological communities, rainforests and the upland swamps are protected.

Management response

4.2.1 Implement relevant recovery actions in the *Biodiversity Conservation Program*, *Saving our Species* program, threat abatement plans and recovery plans for threatened plant species and endangered ecological communities occurring in the park, including survey, monitoring and bush regeneration programs. Where needed, alert road and track maintenance staff to the presence of threatened plants.

4.2.2 Identify and implement other measures as needed to maintain plant biodiversity in the park, with a focus on populations of biogeographically significant species.

4.2.3 Encourage further research on the park's vegetation, giving priority to the distribution, ecology and management needs of threatened species and communities.

4.3 Native animals

As with plant diversity, the park also has a high diversity of animal species owing to the broad range of habitats that result from the diverse landforms, climate and vegetation types of the Illawarra escarpment. Nearly all the park is considered to be of primary conservation importance as habitat for threatened animals (NPWS 2003), and the remaining areas function as habitat support for the primary areas, as buffers to disturbance or as regenerating habitat.

Twenty-one threatened animal species have been recorded in the park (see Appendix 3).

Important species occurring on the sandstone plateau at Bulli Tops and Maddens Plains include the vulnerable koala (*Phascolarctos cinereus*) and giant burrowing frog (*Heleioporus australiacus*), and the mainland tiger snake (*Notechis scutatus*). Numbers of Mainland tiger snakes are declining in the Sydney Basin owing to loss of habitat and other impacts. This area also contains high-quality habitat for the endangered broad-headed snake (*Hoplocephalus bungaroides*) and the vulnerable red-crowned toadlet (*Pseudophryne australis*), both of which are restricted to sandstone environments (NPWS 2002b).

Some threatened animals such as the vulnerable sooty owl (*Tyto tenebricosa*) are restricted to the moist escarpment forests. The escarpment forests are also core habitat for species such as the green catbird (*Ailuroedus crassirostris*) and golden-crowned snake (*Cacophis squamulosus*), which have only half of their high-quality habitat protected in reserves, and for the region's most diverse assemblage of arboreal mammals (NPWS 2003). Populations of the Australian brush-turkey (*Alectura lathami*), which were moderately common in the 19th century but close to extinction by 1900, are now increasing in the escarpment forests (NPWS 2002b).

The park forms part of the north–south Moist Forest Linkage, which provides the only corridor for animals restricted to moist forests to move between similar habitats in Royal National Park and protected areas further south (NPWS 2002b). The Linkage coincides with a habitat transition zone for a range of northern and southern fauna, and which is reflected in the diversity of animal species present. Typical northern species, such as the green catbird, are found alongside southern temperate forest species, such as the highlands forest-skink (*Nannoscincus maccoyi*).

Strategies for the recovery of threatened species, populations and ecological communities have been set out in a statewide *Biodiversity Conservation Program* (OEH 2018a, formerly known as the Threatened Species Priorities Action Statement (DECC 2007)). These actions are currently prioritised and implemented through the *Saving our Species* program which aims to maximise the number of threatened species that can be secured in the wild in New South Wales for 100 years (OEH 2016).

Individual recovery plans may be prepared for nationally listed threatened species and recovery plans were prepared for some species listed in New South Wales.

Issues

- Knowledge of the animal species of the park and their ecological requirements, particularly of invertebrate species, is incomplete. Freshwater macroinvertebrates are used in water quality monitoring as indicators for assessing environmental health.
- Animal habitat in the park is fragmented by roads, utilities corridors and clearings. Maintaining animal populations is dependent on retention of remaining habitat integrity and connectivity between the separate sections of the park (see Section 5.3).
- Native animal species, including threatened species, are affected by predation, competition and habitat degradation from pest animal species and weeds (see Section 5.1).
- The extensive urban interface of the park further increases threats to animal populations as a result of predation by domestic pets and garden escapee weeds (see Section 5.3).

Desired outcomes

- Native animal biodiversity (species, populations, communities and their habitats) is protected.
- The habitat and populations of all threatened animals are protected and maintained.

Management response

4.3.1 Implement relevant recovery actions identified in the *Biodiversity Conservation Program*, *Saving our Species* program and recovery plans for threatened animal species and populations occurring in the park. Work with other government agencies and landowners to implement plans in a coordinated fashion.

4.3.2 Identify and implement other measures as needed to maintain native animal biodiversity, with a focus on biodiversity restricted to escarpment habitats.

4.3.3 Undertake surveys to check for the presence of threatened animals not yet recorded but for which the park provides core habitat.

4.3.4 Encourage research into the distribution and habitat requirements of threatened animals that occur within the park, including surveys of and collection of baseline data for invertebrate species.

4.4 Cultural heritage

Cultural heritage comprises places, features and items that have, or may have, social, spiritual, historical or aesthetic significance. It includes living stories and connections to places, resources, objects, customs and traditions that individuals and communities have inherited and wish to conserve for current and future generations. Cultural heritage is complex, and the significance of a place or feature may differ for different people.

Aboriginal heritage and heritage post-1770 are dealt with separately in this section, but cultural heritage after 1770 is a shared history involving Aboriginal and non-Aboriginal people.

Aboriginal heritage

The park is located within the Country of the Dharawal People and in the area of the Illawarra Local Aboriginal Land Council.

The escarpment, named Merrigong, has great symbolic and historical importance for local Aboriginal people, who have a continuing association with the area. Traditionally it was an important site for ceremonial practices and a rich source of food, medicine and other resources and it is still used for these purposes today.

Merrigong has a number of named mountains. These include Wonga (Wongawilly), meaning native pigeon, Gerringully, Wanyambilli, Burelli, Nebo, Djera (Keira), meaning wild turkey, Kurimul (Corrimal), named after an Aboriginal warrior, Woonona and Bulla or Bulla Bulla (Bulli) meaning two mountains (Mount Kembla and Mount Keira) (NPWS 2002a; Timbery, cited in Wesson 2005; Timbery-Bennett in DEC 2004; Lynch c. 1830, cited in Organ 1990; Dollahan Undated, cited in Organ 1990; WCC 1995, Undated). Kembla derives from either Jum-bulla, meaning wild game abundant or plenty of game, or from Djembla, meaning wallaby (Wesson 2005).

High places are generally culturally important and Djera and Djembla are of particular significance. There are creation stories associated with Djera, Djembla and Kurimal and it is likely that Dharawal knowledge-holders are custodians of stories for other Illawarra landforms that have not been made public. Aboriginal creation stories express the deep cultural and physical connections between the people and their environment.

The Illawarra Aboriginal people have strong cultural associations with the Aboriginal groups of Gurungatta to the south, the Gundungurra and Wiradjuri to the west and the Darug and Awabakal to the north. Traditionally, these Aboriginal groups traded abundant resources and specialist artefacts for scarce resources and other specialist artefacts, sought marriage partners and met for ceremonies and other activities.

The escarpment presents challenges for any east–west travel. Passes including Juainbilliley (Stanwell Park), Woonona (now Bulli Pass), Keira, Kembla, Wongawilly and Tongarra (near Macquarie Pass) were used for travel between the coastal plain and the Woronora Plateau

or Kangaroo Valley (Organ 1990; Timbery, cited in Wesson 2005). The escarpment rim provides a relatively flat travelling route and was probably traversed along its entire length. From the rim, routes extended north-west along ridgelines (for example, Picton Road) and river valleys (for example, Cordeaux Valley).

Analysis of Aboriginal resource use in the Illawarra has revealed the subtropical rainforest of the Illawarra escarpment is one of the most resource-rich vegetation associations, followed by moist blue gum forest and warm temperate rainforest. The escarpment is also ideal habitat for a range of animals used by the Dharawal People for their eggs, flesh, skins, fur, bones, feathers and tails. At least 68 plant species and a wide range of animals are known to have been traditionally utilised (Wesson 2005) while contemporary oral histories describe use of the escarpment foothills for the harvesting of fruit (Timbery-Bennett, cited in DEC 2004).

The park comprises only a portion of the Illawarra that had, and continues to have, great significance for Aboriginal people. It was through accessing the resources of the whole region with its mountain, coastal, riverine, estuarine and marine environments that Aboriginal people maintained a rich and varied spiritual, social and economic life.

Little of the park has been subjected to systematic archaeological survey and only a small number of Aboriginal sites have been recorded. These comprise landscape features, artefact scatters, grinding grooves, rock engravings and rock shelters with occupation deposits or art. The nearby coastline has a number of artefact scatters, middens and burials, and the plateau west of the park is especially rich in art and archaeology.

NPWS recognises that Aboriginal people are the original occupants and custodians of all the land, water, animals and plants in the park. NPWS also acknowledges the right of Aboriginal people to make decisions about their own heritage. It is therefore policy that Aboriginal communities be consulted and involved in the management of Aboriginal sites, places and related issues, and the promotion and presentation of Aboriginal culture and history.

Post-1770 heritage

The post-1770 history of the Illawarra is intrinsically linked to the escarpment. It drew the attention of Europeans from their earliest encounters. In 1770 Lieutenant James Cook, observing that the shape of Mount Kembla resembled a hat, named the peak ‘Hatte Hill’. The voyage’s main naturalist, Joseph Banks, noted the escarpment’s unusual vegetation and the ship’s artist, Sydney Parkinson, recorded the profile of the escarpment in a drawing (Organ & Doyle 1995).

By 1812, red cedar in the rainforests drew private timber-getters into the region. Exploitation of this timber exhausted the region’s supply within a short time.

From 1815, tracks and routes were opened down the escarpment, some following traditional Aboriginal routes. A number of colonial roads traverse the park (see Appendix 4). Some of these retain early stonework, including retaining walls and cobblestone surfacing.

Dr Charles Throsby moved cattle into the Illawarra area in 1815 and by 1840 clearing had enabled farms to be established on the escarpment foothills and benches. Convict labour and the rich soils were used to grow crops such as wheat, maize, turnips and potatoes (Mitchell 1997). Later, dairying was the main activity. A number of people squatted on the escarpment because they were too poor to afford properties on the coastal plain. Remnants of farming activities and residences are still apparent in several places in the park (see Appendix 4).

From 1849, mines spread along the escarpment from Clifton to Wongawilli. Coal became a dominant component of the Illawarra’s economy and it remains so. Coal drove the region’s

development beyond farming and led to a rapid increase in the local population, with shanty villages appearing on the escarpment to accommodate miners. Exploitation of the escarpment's coal reserve, and the physical constraints that the escarpment and plateau placed on other developments, led to them remaining in a largely natural condition. This provided the circumstances for the later establishment of the park. Locations and structures associated with coal mining in the park are listed in Appendix 4. They include mine workings, buildings and houses, most notably the Mount Kembla Mine, Port Kembla No. 2 Mine and the associated Edna Walling House and Garden precinct.

The recreational value of the escarpment was recognised in the late 19th century, with the purchase of Bulli Lookout (outside the park) and construction of walking tracks and lookouts. Picnicking at lookouts was a popular pastime and stone structures were built at several key vantage points adjacent to the park. Other recreational features developed on the escarpment included the Mount Keira Scout Camp and Girl Guide Camp and the Rhododendron Gardens at Mount Pleasant.

The Girl Guide Camp site is reported to have formerly contained buildings used to house American servicemen during World War II. Also dating from the war is part of a tank trap that formerly extended from Mount Kembla to Port Kembla beach.

Issues

Aboriginal heritage

- The escarpment continues to have great significance to the Dharawal People and is a living cultural landscape. However, this association is not widely known or understood by the public. NPWS has produced, in consultation with local Aboriginal people, a number of documents that record the history of Aboriginal people in the Illawarra, their resource use and travel routes, and the importance of the area to them.
- Aboriginal heritage and connection to nature are inseparable and need to be managed in an integrated manner across the landscape.
- The naming of places and facilities in the park with Aboriginal names would reflect and respect the significance of the area to Aboriginal people. There are opportunities to adopt, in consultation with the Aboriginal community, appropriate names for tracks and locations.
- There has been little archaeological survey on the escarpment and therefore documented knowledge is limited. A detailed survey could be expected to reveal many more sites and additional site types such as scarred trees, burial sites, birthing trees and initiation sites.

Post-1770 heritage

- Historic places are threatened by physical deterioration, vandalism, remoteness, landform instability and vegetation growth.
- Most places have not been formally recorded, and information held in the local community about their past use needs to be captured.
- Several of the historic places are listed on state or local heritage inventories (see Appendix 5) and the Mount Kembla Mine, Port Kembla No. 2 Mine complex and World War II tank trap are being considered for nomination on the State Heritage Register.
- The large number of historic features makes it vital to assess their significance and determine priorities for funding any conservation work needed. It is unlikely, however, that active conservation of those structures that are in ruins would be warranted.

- A conservation management plan has been prepared for the Mount Kembla Mine (Otto Cserhalmi & Partners 2009). The plan recommends control of runoff, stabilisation of key structures, repair and maintenance of the pit-pony stables, weed control, removal of damaging trees, maintenance of clearings around significant structures, interpretation, and provision of walking access as far as the stables. Small moveable heritage items (such as lamps, boots etc.) have been salvaged from the site but need to be appropriately stored or displayed. Skips remaining on the site are in danger of being buried in a gully and should be relocated and conserved if possible.
- A conservation analysis has been prepared for the Port Kembla No. 2 Mine and associated Edna Walling precinct detailing its history and significance (OEH 2012a). The conservation analysis recognises the significance of the mine and Edna Walling precinct and recommends their listing on the State Heritage Register. Three of the houses are leased as private residences and ongoing residential occupation or other use is important for their security, protection and maintenance. The fourth house is on a geologically unstable slope. It is dilapidated, and it is unlikely to be economical to repair it.
- Re-use of the suitable buildings in the park would be desirable if an appropriate use can be found consistent with future conservation management plans. The NPW Act provides for the adaptive re-use of buildings or structures, as long as their use and management are consistent with the Act and with the retention of the item's cultural significance.
- Asbestos has been exposed in the roof of the Port Kembla No. 2 mine washroom and the walls of the buildings have been damaged. Consideration will have to be given to whether the cost of restoring the buildings for re-use can be justified.
- Modification or demolition and removal of some historic structures may be needed for safety and environmental reasons. However, this would be undertaken only after comprehensive risk and heritage assessments have been completed and full recording of the site undertaken.
- Sections of the community have a strong interest in the historic heritage within the park as it represents both living and ancestral connections to locations and events. In particular, the Mount Kembla community and descendants of mining families have strong connections to the Mount Kembla Mine site. There is potential for community involvement in maintaining some historic features.
- Historic heritage items in the Mount Keira Scout Camp and Girl Guide Camp are managed by the camp managers in accordance with their licences and the strategies of this plan of management. A conservation analysis (OEH 2013b) has been prepared for the Scout camp to identify and record the cultural features of the site and to assess the cultural significance of the site. The report identified that Mount Keira Scout Camp is significant as an early New South Wales Scout camp forming part of the worldwide Scouting movement and for its association with important figures, including landscape designer Paul Sorenson. The report also found the Scout camp is significant aesthetically for its location high on the escarpment, for the considered layout of the camp and for the high-quality of the design of the initial buildings. This report informed a draft conservation management plan for the Scout camp (OEH 2018b).

Desired outcomes

- The cultural heritage values of the park are protected and managed in a strategic, comprehensive and integrated way.

- Community connections with heritage places are acknowledged and respected and the community is involved in their management where appropriate.
- Visitors and other stakeholders understand and appreciate the cultural heritage values of the park and their responsibilities in helping to protect them.

Management response

4.4.1 Actively engage with Aboriginal community organisations and individuals in identifying, protecting, monitoring and managing Aboriginal cultural heritage and when planning developments that could affect Aboriginal heritage.

4.4.2 Undertake an archaeological survey and cultural assessment before undertaking any work with the potential to affect Aboriginal sites or values.

4.4.3 In consultation with the Aboriginal community, investigate opportunities to survey and record Aboriginal sites in the park and conduct surveys as resources permit.

4.4.4 As a means of recognising the traditional connections of Aboriginal people to the area, give Aboriginal names to the park's visitor sites and trails where an appropriate name can be found, in consultation with the Aboriginal community.

4.4.5 Support the naming, or dual naming, of landscape features with Aboriginal names, in conjunction with Aboriginal communities and the NSW Geographical Names Board.

4.4.6 Do not publicise the location of Aboriginal sites or other cultural information without the agreement of the Aboriginal community.

4.4.7 Implement the conservation management plan for the Mount Kembla Mine, including maintaining the pit-pony stables. Consider feasible options for adaptive re-use of the stables for education or another appropriate purpose. Manage the rest of the site as a ruin but address stability and encroaching vegetation.

4.4.8 Finalise and implement a conservation management plan for the Mount Keira Scout Camp.

4.4.9 Determine an appropriate management strategy for moveable heritage salvaged from the Mount Kembla Mine site. Investigate options for recovery and possible interpretation of the skips that remain on the site.

4.4.10 Prepare and implement a conservation management plan for the Port Kembla No. 2 Mine site, including the Edna Walling precinct.

4.4.11 Record and demolish the dilapidated Edna Walling house if it is not economically feasible to stabilise the slope and repair the house. Keep retaining walls and other durable features where possible, as a record of the house and site.

4.4.12 Continue to lease the remaining Edna Walling houses and gardens for residential accommodation, or consider adaptive re-use for tourist accommodation, education or other appropriate purposes, subject to the conservation management plan.

4.4.13 Investigate the practicality and options for adaptive re-use of mine buildings at the Port Kembla No. 2 Mine for tourist accommodation, education or other appropriate purposes, subject to further geotechnical assessment and the conservation management plan.

4.4.14 Aim to maintain the stability and visibility of the World War II tank trap. Assess its conservation needs and implement any necessary actions.

4.4.15 Consider the Mount Kembla Mine, Port Kembla No. 2 precinct, including the Edna Walling house, and the World War II tank trap for nomination on the State Heritage Register.

4.4.16 Prepare heritage action statements for the stonework on historic roads to determine how they should be protected and managed.

4.4.17 Undertake archaeological assessments of the Tom Thumb and Southern mines to determine their significance. Prepare heritage action statements if needed.

4.4.18 Progressively assess the significance of other heritage sites, landscapes, places and objects in the park.

4.4.19 Develop heritage action statements for any other historic heritage that may warrant active management.

4.4.20 Remove vegetation growing in and around Nunans Cottage.

4.4.21 Involve the community and other stakeholders in identifying and managing historic heritage. In particular, explore the possibility of partnerships for maintenance or restoration of the Edna Walling gardens.

4.5 Recreation, education and research

The park is located adjacent to a large population in the Wollongong area and the coastal communities north and south of there, as well as being easily accessed from Sydney and elsewhere via main roads and public transport. It forms part of a system of protected lands and open space that cater for a wide spectrum of outdoor recreation in the Illawarra. These regional resources include other NPWS-managed reserves such as Royal National Park, Dharawal National Park and Macquarie Pass National Park, WaterNSW picnic areas at Woronora, Cordeaux and Cataract dams, and council parks and reserves. A string of council parks, developed lookouts, cafes, accommodation and other facilities dot the escarpment cliff line, foothills and coastal plain.

The park provides a strong contrast to the urban attractions of Wollongong and other coastal communities, and its facilities complement those on adjacent or nearby lands. Attractions include the escarpment's spectacular scenery and rainforests, the plateau's diversity of wildflowers and native birds, the variety of historic heritage, a network of walking tracks, trails for cycling and horse riding, rock formations for rock climbing and abseiling, picnic facilities, scenic views and lookouts. These attractions provide local recreational opportunities and have the potential to be important for ecotourism in the Illawarra.

The park is subject to heavy recreational pressure owing to the large neighbouring population, but is fragile because of its steep slopes, erodible soils, considerable cultural heritage and significant moist forests. It is vital for use to be sustainable in order to protect the park's important conservation, recreation and education values. Hazards, such as cliffs, instability and disused mines, also limit the types and extent of recreational opportunities that can be provided.

To assist protection of water quality, no new recreational opportunities will be provided in those areas of the park within the Metropolitan Special Area without approval from WaterNSW.

Scenic viewing

The main escarpment lookouts are outside the park, between Mount Keira and Sublime Point. Within the park, there are lookouts at Longview Lookout (Stanwell Tops), Robertsons Lookout (south of Mount Keira), and Mount Kembla Lookout. The Mount Kembla Lookout is located beneath a major overhead powerline that limits the aesthetic values of the site. The former Woodward Lookout (on the Woodward Track) has been closed owing to concerns about the stability of the site.

There are several informal viewing points along trails and tracks, and it may be desirable to formalise some of these for safety reasons, for example the summit of the Mount Kembla Summit Track.

Picnicking

The main picnic area in the park is Byarong Park, a large grassed area on the Mount Keira Road with tables, electric barbecues and toilets. This is a pleasant, leafy picnic area but is under-utilised. The picnic area is bisected by the access road to the adjacent NPWS work depot, which affects its amenity.

Single picnic tables are provided at Robertsons Lookout and Mount Kembla Mine.

Picnic facilities are also located in the Illawarra Rhododendron Gardens, a licensed area open to the public on weekends, with formal gardens, walks and information.

Walking

The park has many walking tracks and management trails above and below the escarpment. Several, particularly the Sublime Point Track and the tracks on Mount Keira and Mount Kembla, are very popular with walkers. Some old or informal tracks are poorly constructed and in very basic condition or have been affected by tree falls or landslips. Because of the nature of the escarpment, walking tracks are very expensive to construct and maintain.

There are two main aims for the walking track network in the park: to create a continuous walking link along the escarpment in conjunction with other land tenures, and to provide a variety of lengths and grades of track, including some loop walks.

In order to identify a continuous and integrated network of tracks, *Illawarra Escarpment State Conservation Area Master Plan for Walking Tracks and Associated Facilities* (Epacris Environmental Consultants 2006) was prepared with community input. It provides for a walking route along the length of the escarpment between Royal National Park and Mount Kembla, and a range of short and medium length loop walks. Most of the proposed tracks follow existing informal routes. Upgrading priority tracks is progressively being undertaken and new tracks will be developed as resources become available. The Throsby Track was not identified in the 2006 master plan as a proposed walking track. However, its significance to the Aboriginal community was noted and the master plan recommended that the location and condition of the Throsby Track be recorded.

The walking tracks master plan is currently more than 10 years old. NPWS will update it to ensure it continues to enable provision of sustainable walking opportunities in the park that allow visitors to experience a wide range of park values, particularly vegetation communities and scenic views. The update will continue the development of a continuous walking link along the escarpment and provide a variety of lengths and grades of track.

Loop tracks are currently provided at Sublime Point (Woodward Track), Mount Keira and Mount Kembla. The Wodi Wodi Track at Stanwell Park and the short Gibson Track at Austinmer can be walked as loops in combination with local roads.

The track to Robertsons Lookout is suitable for wheelchairs and the Woodward Track is suitable for users with limited mobility.

The existing and proposed track network uses management trails and other links to integrate with roads, public transport, parking and food outlets located outside the park. Partnerships with Wollongong City Council and other stakeholders will be necessary to integrate facilities on adjoining lands and to provide walkers with track-head information.

Demand may develop for extending the walking track system south of Mount Kembla as residential development and the local population expand in the West Dapto area. Access to the escarpment in this area is currently available along Bong Bong Road but there are no practical walking route options along the escarpment within the park. Any consideration of walking tracks in this area would need to be in conjunction with other land tenures.

Camping

The Mount Keira Scout and Girl Guide camps include cabin and camping facilities for use by their organisations, which are also available for hire by other groups.

In order to undertake overnight walks along the length of the escarpment, it would be desirable to have two camping sites approximately one day's walk apart. A clearing along the Gibson Track at Austinmer (Austinmer Camp) is currently available for walk-in camping. No facilities are provided, and the site receives little use, but use would be expected to increase as further walking track development occurs. It is important that overnight use does not lead to environmental or social problems given the proximity to residential areas. The site could also serve as a picnic spot for day-walkers.

A clearing at Staffords Farm, south of Robertsons Lookout, may also be suitable for camping. This site is isolated, and the access road is not well-drained but, given that no other sites are available, its potential as a camping site should be further investigated.

Other camping options for walking groups may be the Scout or Guide camps on a pre-booked basis or sites outside the park that may be provided in future by other organisations. Any use of the Scout or Guide camps, if permitted, would be by prior arrangement directly with Scouts Australia NSW or Girl Guides NSW & ACT and in accordance with their requirements and restrictions.

Cycling

Cycling can be an exciting, healthy and environmentally sustainable way of exploring the park road and trail network. In accordance with NPWS policy, cycling is generally permitted on park roads and management trails in state conservation areas. Cycling on walking tracks is prohibited for safety and environmental reasons.

Cycling along the network of public roads, park roads and management trails shown on Figures 3 and 4 is an appropriate use as it is not likely to negatively impact park values. The management trails of the park enable cycling from Maddens Plains to Mount Keira and then on to Mount Kembla via public roads. Cycling is also available on management trails in nearby Dharawal National Park and on other land tenures.

Mountain biking has grown in popularity in the Illawarra and across New South Wales over the last decade with a strong interest in mountain bike single-tracks emerging near urban and regional centres. Single-tracks are narrow, often winding tracks only wide enough to accommodate riders in single file.

Over recent years the un-met demand for mountain bike single-tracks has resulted in cyclists riding on the park's walking tracks and forming numerous illegal tracks throughout the park.

Many of these unauthorised tracks are on steep and unstable slopes. Unmanaged, these tracks can result in soil erosion and risks to land stability. There have been several cycling fatalities and serious injuries on the steep slopes and many complaints from walkers following near misses on the walking tracks and management trails.

As part of supporting sustainable mountain biking, new opportunities are being identified for the park including single-tracks. These will also help limit emerging environmental impacts, park user conflicts and adverse safety outcomes. To achieve this NPWS will develop a mountain biking strategy that provides for sustainable mountain bike single track routes and other links in the park.

The mountain biking strategy will be developed in conjunction with interested stakeholders, including the multi-agency Illawarra Escarpment Mountain Bike Working Group and park neighbours. Riding opportunities provided in the park will link with mountain biking opportunities on adjacent land. The strategy will take into consideration environmental, design and management needs and may set bounds to the extent of tracks.

The mountain biking strategy will be subject to environmental impact assessment and will comply with any additional requirements related to cycling, such as those identified in the NPWS cycling policy and the *Sustainable Mountain Biking Strategy* (OEH 2011b). Both the mountain biking strategy and the environmental impact assessment will be publicly exhibited. Following public exhibition, the mountain biking strategy can be implemented subject to consideration of the outcomes of public exhibition and any constraints and opportunities identified during the environmental impact assessment.

The strategy may be updated from time to time without amendment to this plan of management. Updates proposing new or re-routed tracks will require design, environmental impact assessment and public exhibition.

Horse riding

Horse riding is a popular recreational activity that has cultural associations for many Australians. The NPWS *Strategic Directions for Horse Riding in NSW National Parks* (OEH 2012b) provides a framework for improving riding opportunities in eight priority regions in New South Wales. The South Coast Region, where the park is located, is not one of the priority regions. In accordance with the current NPWS policy, horse riding will be allowed on a number of park roads and management trails, including Farmborough Road Management Trail and those parts of Highlands Parade Trail, O'Briens Trail, Kembla Ring Management Trail and the Bulli section of the Lower Escarpment Management Trail that are within the park. Horse riding is prohibited on trails that are steep and highly erodible or where access is through private land and the relevant landowners have not given permission.

Mount Kembla Mine

As stated in Section 4.5, the local community has strong associations with the Mount Kembla Mine and an ongoing interest in visiting the site, including conducting tours to the mine. The top three terraces (containing the timber yard, bath-house slab and pit-pony stables) have been assessed as low risk from instability but the rest of the site has a higher risk and is not suitable for public access. Public access to the top three levels is appropriate, including provision of interpretation material. The local community has proposed rehabilitating and re-opening the historic Pit Track from Kembla Heights village to the second terrace of the mine site, only a small proportion of which would be within the park.

Other activities

The west- and south-facing cliffs of Mount Keira are used for rock climbing and abseiling, and this has resulted in numerous bolted climbs and the creation of informal access tracks.

To the extent that these activities occur on park, they will continue to be permitted provided safety standards and environmental impacts are acceptable. Basic amenities are available nearby at the Mount Keira Summit Park and access is provided via the Dave Walsh Track. Abseiling and rock climbing are not permitted elsewhere in the park owing to risks to the safety of participants and other visitors from geological instability, damage to vegetation and rock faces, damage to cultural features and soil erosion.

There is no provision for paragliding and hang-gliding in the park because they would require access to areas where the safety and environmental impacts are unacceptable. Past unauthorised use of the park for these activities has led to illegal clearing and vehicle access to bushland areas with high conservation and cultural heritage values.

Information, education and research

Interpretation and education are important tools to promote awareness and appreciation of the values of the park, visitor opportunities and responsible use and behaviour in the park, and to promote a conservation ethic.

Information about recreational opportunities and park values is provided at Byarong Park, Robertsons Lookout and the main walking track entrances. NPWS Discovery and educational programs by other organisations also promote awareness of the park's values and support for conservation more generally.

The park's natural and cultural heritage values and close proximity to the region's schools, technical colleges and the University of Wollongong make it especially valuable for educational visits and research.

Research into the park's natural and cultural features have provided a wealth of scientific and other information but large gaps in knowledge remain. A better understanding of Aboriginal use and heritage values, biodiversity, fire ecology, landforms, historical land use, natural hazards and human impacts would improve conservation and sustainable use.

Commercial activities and short-term licences

Guided tours and other commercial recreational activities, such as abseiling, wildlife viewing and cycling, are often conducted in the park. When the walking track network is completed it may be attractive for guided overnight walks, possibly in conjunction with existing commercial operations in Royal National Park. Any commercial use of the park must comply with NPWS policies and other requirements for commercial activities.

Activities such as music events, weddings or community functions are held in the Scout and Guide camps, Illawarra Rhododendron Gardens and elsewhere. The NPW Act section 151 provides for the grant of short-term licences to use land, buildings or structures, provided the land is modified and the land, building or structures and their permissible purposes are identified in the plan of management. Such licences are granted subject to consideration of conservation values. Areas and buildings within the park that may be considered for short-term licences are:

- Byarong Park – the picnic areas and carparks
- Port Kembla No. 2 Mine – the buildings, mine platform, houses, tennis court, gardens and associated clearings, subject to stability issues being managed
- Mount Kembla Mine – cleared areas on the top two terraces and the pit-pony stables
- Kembla Lookout – the grassed area
- Austinmer Camp – the grassed area

- Mount Keira Scout Camp, Mount Keira Girl Guide Camp and Illawarra Rhododendron Gardens – the cleared areas, carparks and buildings, by arrangement with the long-term licensees consistent with their licence conditions.

Issues

- The park's conservation significance and fragility limit the location, type and extent of recreation opportunities that can be provided.
- There are opportunities to enhance walking, picnicking, viewing scenery, ecotourism and cultural tourism.
- The proposed escarpment-length walking track will need to cross a variety of land tenures and link with facilities outside the park.
- Inappropriate and unauthorised recreational activities are having significant environmental impacts, particularly mountain bike riding on informal trails.
- A small amount of unauthorised trail-bike riding occurs in the park, particularly near the Mount Kembla scramble circuit and along the Lower Escarpment Trail and powerlines. Regular joint law enforcement programs with other land managers and the NSW Police are an important strategy to try to minimise this activity.
- The Illawarra community is diverse, with a range of ethnic and socio-economic backgrounds. Understanding community needs, expectations and ways of relating to nature will be important in order to foster awareness, support and enjoyment of the park.
- It will be important to work with Wollongong City Council and tourism organisations regarding provision of information and promotion of the park's visitor facilities. There may also be opportunities for sponsorship of park facilities and conservation projects.

Desired outcomes

- A range of sustainable recreational and educational opportunities are provided, with a focus on providing for bushwalking within a range of landscapes and vegetation types.
- Use is consistent with the park's management purposes and principles and is safe and environmentally sustainable.
- Facilities within the park are integrated with nearby facilities and transport links.
- There is community understanding and appreciation of the park's natural and cultural values and of the need for minimal impact use.

Management response

4.5.1 Maintain Byarong Park as the major picnic area in the park, with tables, barbecues and toilets. Consider ways to make the community more aware of the picnic area and increase its amenity and level of use, for example through re-routing the access road to the work depot, signposting, provision of additional barbecues and tables, a short loop walk or a children's educational play facility.

4.5.2 Review and update the walking track master plan to ensure sustainable walking opportunities are provided and the walking track system is enhanced through upgrading and constructing tracks where needed.

4.5.3 Work with Wollongong City Council and other stakeholders to integrate facilities within and outside the park, including improved parking, signage and information and, possibly, camping facilities.

4.5.4 Investigate opportunities for providing disabled access on the Woodward Track and the need for a new lookout.

4.5.5 Improve the amenity and function of the Mount Kembla Lookout precinct.

4.5.6 Consider formalising a viewing point at the summit of the Mount Kembla Summit Track.

4.5.7 Trim vegetation to maintain views from the escarpment lookouts where needed or allow Wollongong City Council to undertake trimming to specified standards.

4.5.8 Attempt to determine the location and record the condition of the Throsby Track within the park.

4.5.9 Improve access and parking at the Mount Kembla Mine site, to enable small-scale tourism to the top three terraces. Provide interpretation of the site. Assess the need for additional seating for tour groups. Investigate reinstating the park section of the historic Pit Track to the mine from Kembla Heights village, in conjunction with other landowners and organisations.

4.5.10 Permit walk-in camping at Austinmer Camp. Provide a toilet, picnic table and rainwater tank if warranted. Close the site to walk-in camping if use becomes inappropriate.

4.5.11 Investigate making Staffords Farm available for walk-in camping. Construct a basic toilet if warranted.

4.5.12 Prohibit camping elsewhere in the park, except in special circumstances and where written consent is obtained, or in accordance with the Mount Keira Scout and Girl Guide Camp licences.

4.5.13 Prohibit wood fires in the park except for campfire circles permitted in the Mount Keira Scout and Girl Guide camps. Wood used for the campfire circles must be collected from outside the park.

4.5.14 Permit cycling on public access roads and management trails but continue to prohibit cycling on walking tracks. Close and rehabilitate unauthorised cycling trails. Conduct education campaigns to encourage cyclists to ride legally and minimise environmental impacts.

4.5.15 Promote shared track cycling protocols and safety messages on interpretive signs and other information.

4.5.16 Prepare and exhibit a mountain biking strategy to provide sustainable mountain bike single track in the park.

4.5.17 Implement the mountain biking strategy taking into consideration the outcomes of the environmental impact assessment and feedback from public exhibition.

4.5.18 Permit horse riding on public access roads, Farmborough Road Management Trail and those parts of the following management trails that are within the park: Bulli section of the Lower Escarpment Management Trail, Highlands Parade Trail, O'Briens Trail and Kembla Ring Management Trail.

4.5.19 Permit rock climbing and abseiling only on the south- and west-facing cliff lines of Mount Keira, as long as it is undertaken in a safe and environmentally acceptable manner.

4.5.20 Limit the size of group activities without written consent to:

- cycling, including mountain biking: 20 people
- horse riding: 8 horses
- rock climbing: 4 per roped party
- walk-in camping: 16 people
- other activities: 20 people.

Group size limits not requiring written consent will be monitored and adjusted based on impacts to the environment, visitor amenity and maintenance requirements.

Group size limits at the Rhododendron Gardens and at the Scout and Guide camps are in accordance with their licences.

4.5.21 Prohibit hang-gliding and paragliding in the park.

4.5.22 Promote understanding and appreciation of the park's values, and visitor responsibility in protecting those values, including:

- significant geological and geomorphological features
- land stability and soil erosion issues
- significant biodiversity, including rainforests and threatened species
- Aboriginal cultural heritage, particularly of Mount Keira and Mount Kembla
- historical heritage values, including the wide range of features and the significance of Mount Kembla Mine as the site of Australia's worst mine disaster.

4.5.23 Conduct community education programs as needed or in conjunction with other agencies and partners to promote awareness of the park, support for its protection, responsible use and knowledge of related conservation issues and behaviour such as living with wildlife and avoiding weed invasion.

4.5.24 Engage with stakeholder and community groups from a range of backgrounds to understand their expectations and needs and foster participation in park visitor opportunities. Target information and activities to particular groups where needed.

4.5.25 Encourage involvement of the Aboriginal community in the interpretation of Aboriginal heritage.

4.5.26 Undertake a program to ensure there is an adequate level of signage in the park, including directional, safety and interpretive information.

4.5.27 Permit short-term community and commercial use of the park's modified natural areas and structures for purposes such as community and family events, private functions, appropriate sporting events, cultural events and filming. Any such use of the Mount Keira Scout Camp, Mount Keira Girl Guide Camp and Illawarra Rhododendron Gardens will need to be arranged with the licensee and be consistent with their licence conditions.

4.5.28 Permit commercial tours and recreation activities, subject to NPWS licensing and other requirements for commercial use being met, and with minimal impacts on natural and cultural values or conflicts with other users.

4.5.29 Monitor visitor use and the impacts of recreation activities on conservation values. If unacceptable impacts occur, undertake measures, such as education, law enforcement, or modification or closure of facilities, in discussion with user groups.

4.5.30 Permit appropriate research and educational programs by other organisations in the park and encourage environmental education initiatives that promote a conservation ethic and sustainable visitor behaviour.

4.5.31 Conduct regular joint law enforcement programs with other land managers and the NSW Police to minimise unauthorised trail-bike riding in the park.

5. Threats

The greatest threats to the park's values are erosion and landslips, pollution, pests, bushfires, isolation and fragmentation, and climate change. Erosion and landslips are covered in Section 4.1.

5.1 Pests

Pest species are plants, animals and pathogens that have negative environmental, economic and social impacts; commonly they are introduced species. Pests can have impacts across the range of park values, including on biodiversity, cultural heritage, and catchment and scenic values.

NPWS prepares regional pest management strategies that identify pest species across that region's parks and priorities for their control, including actions listed in the *Biodiversity Conservation Program* (see Sections 4.2 and 4.3), threat abatement plans, and other strategies such as the NSW *Biodiversity Priorities for Widespread Weeds* (DPI & OEH 2011) and the *NSW Biosecurity Strategy 2013–2021* (DPI 2013).

The NPWS regional pest management strategy for the South Coast Region (OEH 2013c) identifies pest species and priority programs for this park. 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- or pest-specific plans or strategies need to be developed to provide a more detailed approach.

Introduced plants

Most weed species are sun-loving colonisers of disturbed sites. Clearing, ground disturbance and high fire frequency encourage the spread of weeds. Weeds are spread, either vegetatively or as seeds, via stormwater, wind or attached to vehicles, bikes, footwear and animals. Many weeds are garden escapees.

Weeds are widespread in the park along roads and powerline corridors and in locations that have been disturbed by mining, farming or other human activities. Spot infestations of wind-dispersed weeds, such as pampas grass (*Cortaderia* sp.), can also occur deep inside the park.

Major weed species recorded include lantana (*Lantana camara*), pampas grass, crofton weed (*Ageratina adenophora*), privet (*Ligustrum* spp.), blackberry (*Rubus fruticosus* agg.), moth vine (*Araujia sericifera*), trad (*Tradescantia fluminensis*) and Madeira vine (*Anredera cordifolia*). Weeds that are gaining a foothold include ground asparagus (*Asparagus aethiopicus*), Mysore thorn (*Caesalpinia decapetala*), whisky grass (*Andropogon virginicus*), Formosan lily (*Lilium formosanum*) and ginger lily (*Hedychium gardnerianum*). Significant weeds are listed in Appendix 6.

The invasion and establishment of exotic vines and scramblers and the invasion, establishment and spread of lantana are listed as key threatening processes under the BC Act because of their potential to significantly affect biodiversity by out-competing native species and altering their habitats (NSW SC 2006a, 2006b). The moist escarpment forests are particularly vulnerable to introduced climbers.

The *Biosecurity Act 2015* and regulations provide specific legal requirements for the prevention, eradication or containment of state-level priority weeds. These requirements apply equally to both public and privately-owned land. A regional strategic weed management plan prepared under the Biosecurity Act identifies those pest plants that are

priorities for management action, investment and compliance effort within the South East Local Land Services region (South East LLS 2017). These priorities will be implemented via the relevant NPWS pest management strategy.

Weed control programs have focused on sites adjoining developed areas and along roads and water channels. Prevention of further weed infestations is dependent on avoiding soil disturbance and maintaining vegetation canopies to shade the ground. Encouraging regrowth in formerly disturbed areas and minimising tracks and trails are important weed prevention strategies.

Weeds are a problem across all land tenures. Cooperative weed control with other agencies such as WaterNSW, Wollongong City Council, South East Local Land Services, the Illawarra District Weeds Authority and utility providers is necessary to manage weeds across the landscape.

Myrtle rust (*Austropuccinia psidii*) is known to occur on scrub turpentine (*Rhodamnia rubescens*) in the Mount Keira and Sublime Point areas. It has significant implications for the health of native plants of the family Myrtaceae in the park and the sustainability of ecosystems with these plants. It is managed in accordance with the *Management Plan for Myrtle Rust on National Parks Estate* (OEH 2011a). The soil borne pathogen *Phytophthora cinnamomi* is present to the north of the park and is a potential risk to the vegetation of the Illawarra escarpment. Hygiene protocols exist to minimise spread and prevent introduction of phytophthora.

Introduced animals

Foxes (*Vulpes vulpes*), feral cats (*Felis catus*) and feral deer (rusa deer *Cervus timorensis* and fallow deer *Dama dama*) are the major pest animals in the park. Feral goats (*Capra hircus*), rabbits (*Oryctolagus cuniculus*) and other introduced species also occur in some areas. The dumping, escape or poor control of domestic animals are significant sources of pest animals.

Pest animals threaten vegetation, soils, water quality, habitats for native species, visitor safety and assets in the park and on neighbouring land. Predatory animals, such as cats and foxes, can be a significant threat to native animals, especially ground-dwelling species. Herbivores such as deer can have a significant effect on vegetation, promote the spread of weeds and threaten the scenic character of the park. Introduced animals may also spread diseases such as hydatids and phytophthora that are harmful to wildlife and susceptible plant species. Hard-hoofed animals also threaten cultural heritage values. Predation by foxes and cats, and herbivory and environmental degradation caused by feral deer, are listed as key threatening processes in New South Wales (NSW SC 1998, 2000c, 2004).

Because of the fragmented nature of the park it is essential for pest animal programs to be coordinated across neighbouring land tenures. A deer control program began in 2008 and NPWS is committed to continued deer control in conjunction with other agencies and neighbouring landowners. Fox control and other pest programs are undertaken from time to time but need to be done cooperatively to be effective.

Local Land Services are coordinating development of regional strategic pest animal management plans to support the implementation of the Biosecurity Act. Priorities identified in the South Coast regional strategic pest animal management plan will be implemented via the relevant NPWS pest management strategies.

Desired outcomes

- The environmental impacts of introduced species are minimised, particularly on threatened, rare or regionally significant plants and animals.

- Pest species management is planned, strategic and coordinated with other authorities and landowners.
- New non-native plants and animals are not introduced into the park.

Management response

5.1.1 Manage pest animals and weeds in accordance with pest management strategies relevant to the park.

5.1.2 Limit visitor and other activities to areas already disturbed, as far as possible, to avoid creating new areas for weed invasion.

5.1.3 Manage introduced plants in culturally sensitive significant landscapes in accordance with the *Burra Charter*.

5.1.4 Manage threats from plant pathogens in accordance with statewide guidelines. Ensure risk-based plant pathogen hygiene protocols are observed for all management activities, including those of other authorities.

5.1.5 Use locally indigenous plant species, as far as practical, for all landscaping purposes in the park.

5.1.6 Coordinate pest and weed management programs in the park with licensees, other authorities and landowners and with volunteer bush regeneration groups.

5.2 Fire

The primary objectives of NPWS fire management are to protect life, property, community assets and cultural heritage from the adverse impacts of fire, while also managing fire regimes in parks to maintain and enhance biodiversity. NPWS also assists in developing fire management practices that contribute to conserving biodiversity and cultural heritage across the landscape and implements cooperative and coordinated fire management arrangements with other fire authorities, neighbours and the community (OEH 2013a).

Fire is a natural feature of many environments and is essential for the survival of some plant communities. However, inappropriate fire regimes can lead to loss of particular plant and animal species and communities, and high frequency fires have been listed as a key threatening process under the BC Act (NSW SC 2000b).

The park varies greatly in slope, aspect and vegetation. The plateau is subject to higher temperatures and higher exposure to drying westerly winds and sun, and is therefore more fire-prone, than the escarpment slopes. Conversely the shaded aspect and orographic influence of the escarpment increases humidity and precipitation on the slopes and tends to reduce the fire threat.

These effects are evidenced by documented fire history. The last major wildfire on the escarpment occurred in 1968 when fires burning under the influence of a westerly air stream altered their direction under a strong southerly wind change and spread north rapidly along the escarpment slopes. The last major wildfire on the plateau occurred under drought conditions in December 2001 when intense fires burnt rapidly to the escarpment fanned by strong westerly winds.

Dry open forests, heaths and sedgelands dominate the plateau, and the dry open forests consist mainly of sclerophyllous plants that are flammable and adapted to frequent fires. These factors, together with the drier climate, make bushfires a relatively frequent event on

the plateau compared with the escarpment. In some locations the fire frequency has exceeded the plant community threshold.

The moist open forests on the escarpment can have high fuel loads but the heavy shade and higher rainfall promotes a moist understorey that generally retards fires. These moist open forests are adapted to fire-free periods ranging from at least 30 years to up to 200 years. However, they require occasional fires to trigger their regeneration.

Rainforests are generally intolerant of fire, requiring long periods without fire to regenerate and mature and typically occupy deeply shaded pockets where fires rarely penetrate. Rainforests are generally less flammable than open forests, which enables them to function as natural buffers to fire. This can enhance the protection of assets from bushfires.

Native plants and animals are adapted to cope with particular fire regimes. Significant changes to the frequency or intensity of bushfires threaten their ability to survive and reproduce. In some circumstances, fires are also known to contribute to rock falls and land instability by removing vegetation.

More frequent fires on the escarpment would cause open forests to expand and rainforests to decline, resulting in more fire-dependent and fire-prone vegetation communities and increased fire risk.

In addition to creating increased fire risk, burning for hazard reduction in moist forests on the escarpment slopes is further limited by slope instability, limited containment options, a restricted burning window and longer ecological prescriptions for intervals between fires. Mechanical methods of hazard reduction are preferred for these forests.

As well as affecting natural values, bushfires and bushfire management can damage cultural heritage, recreation and research values, and some cultural heritage items, such as the pit-pony stables, are highly vulnerable. Fire can destroy timber assets or relics, such as the pit-pony stables at Mount Kembla and Port Kembla No. 2 mines, and it can accelerate damage to items made of metal or stone. Most fire management equipment and techniques are also capable of damaging cultural heritage values. Without due diligence, the use of fire, vehicles, chainsaws, rake hoes, salt water or chemicals and heavy equipment all pose risks.

The shape and fragmentation of the park means that any fire may affect multiple land tenures, and cooperation with other landowners and land managers is an integral part of effectively managing fire on the Illawarra escarpment. NPWS maintains cooperative arrangements with surrounding landowners and the NSW Rural Fire Service and is actively involved with the Illawarra Bush Fire Management Committee. Cooperative arrangements include fire planning, fuel management and information sharing. Hazard reduction programs, proposals for ecological burning and fire trail works are submitted annually to the bush fire management committee.

The park borders urban communities, mainly along its eastern boundary, at Stanwell Park, Austinmer, Thirroul, Bulli, Woonona, Tarrawanna, Mount Keira and Mount Kembla. It is also close to rural properties at Dapto and Wongawilli. The close proximity to urban areas has necessitated the development of asset protection zones adjoining private property. These provide areas of reduced fuel to enhance protection of property and provide access for fire suppression. New developments are required to provide the asset protection zone.

Licensees are responsible for managing fire risk within their licence areas.

A network of management trails and other infrastructure facilitate fire management. There are few fire points, such as helipads and static water supplies, in the park owing to the nature of the landscape. Land below the escarpment is steep and heavily forested, so access to

historically cleared areas is often difficult. Areas on the plateau are considered hazardous if they are located close to the cliff edge. Water points are mostly hydrants in residential areas or ponds associated with previous mining activities. Refuge areas are often picnic areas, previously cleared mining land and adjoining farming areas.

A fire management strategy that defines the fire management approach for the park has been prepared (DECC 2009) and is updated periodically. The fire management strategy outlines the recent fire history of the park, key assets within and adjoining the park including sites of natural and cultural heritage value, fire management zones and fire control advantages such as management trails and water supply points. It also contains fire regime guidelines for conservation of the park's vegetation communities.

Desired outcomes

- Bushfire mitigation measures contribute to the cooperative protection of life, property and community assets.
- Natural fire regimes are maintained to protect biodiversity and avoid transition to more fire-prone vegetation. Fire-sensitive plant communities, such as rainforest, are protected from bushfire.
- Bushfires do not exacerbate land instability.
- Significant cultural heritage features are afforded protection from damage by bushfires and bushfire suppression activities.
- Areas disturbed by fire suppression operations are rehabilitated as soon as practical after the fire.

Management response

5.2.1 Manage fire in accordance with the fire management strategy for the park.

5.2.2 Consider natural fire regime thresholds and measures to protect biodiversity, cultural heritage, land stability, recreation and research values in bushfire planning and management, including ecological burns. Exclude fire from rainforests and other fire-sensitive vegetation.

5.2.3 Limit the use of fire as a method of hazard reduction on the escarpment slopes. Mechanical slashing is preferred.

5.2.4 Wherever possible, avoid the use of heavy machinery for fire suppression in wetlands, rainforest, endangered ecological communities and areas with threatened plant species or archaeological sites. Avoid use of salt water or foam in wetlands and areas of endangered ecological communities or threatened plant species.

5.2.5 Maintain asset protection zones to protect assets in and adjacent to the park, in accordance with the park fire management strategy.

5.2.6 Engage with neighbours and other stakeholders with regard to bushfire asset protection.

5.2.7 Continue to participate in cooperative fire management planning and operations, primarily through involvement in local bush fire management committees.

5.3 Habitat fragmentation and boundary issues

The fragmented and linear nature of the park threatens the maintenance of biodiversity. The plateau wetlands and moist escarpment forests (particularly rainforests) are particularly

susceptible to isolation and edge effects such as exposure. Where not reserved, the foothill communities are at risk from clearing for development.

Fragmentation of the moist forest wildlife corridor along the escarpment has impacts beyond the Illawarra, because native animals use it to move between Royal National Park and natural areas further south. Protection of corridor function is a high conservation priority.

Land addition would be desirable to connect the separate sections of the park, widen narrow sections and improve connections to other protected land. Mechanisms such as conservation agreements with adjoining land owners to protect adjacent land would also assist. The Great Eastern Ranges Initiative was established to link conservation organisations with government agencies, with the aim of increasing connectivity across land tenures, and may assist with connectivity along the Illawarra escarpment.

The variety of tenures that surround the park have conflicting management objectives (e.g. conservation, recreation, resource use and development) and differing priorities (e.g. mining, fire, weeds, flooding, landslip, recreation, private uses) that affect overall management of the lands and the environment. Cooperative management is necessary to ensure a balance between conservation and other purposes.

Clearings and roads are physical barriers to the movement of wildlife along the escarpment. They disrupt feeding and breeding of animals and their ability to find refuge from events such as bushfires. Movement across roads also leads to higher animal mortality, which can affect the survival of species that are coping with other impacts or are under threat. It is therefore desirable to minimise the width of roads and retain adjacent vegetation.

The extent of development along the park's eastern boundaries requires a strong focus on issues such as bushfires, weeds, non-native animals and illegal use of the park. A large proportion of neighbours assist through responsible pet ownership and other efforts, but park management still needs to address a significant number of threats. These include frequent encroachments (such as extension of gardens and construction of sheds and driveways), dumping of garden refuse and other waste, poor control of domestic animals. In particular, encroachments into bushfire asset protection zones pose serious threats to properties and the safety and effectiveness of fire management and access on the urban interface.

Impacts such as car and rubbish dumping, vandalism and other illegal activities also occur on other park boundaries where there is vehicle access, such as in the Mount Kembla and Maddens Falls areas.

Desired outcomes

- Habitat integrity is maintained to facilitate wildlife movement and long-term population viability.
- Neighbours and other landowners support conservation of adjoining areas of native vegetation along the escarpment, to maintain and enhance connectivity between the different sections of the park.
- Encroachments are removed and other environmental impacts along the urban–bushland interface are reduced.

Management response

5.3.1 Encourage the maintenance of habitat connectivity along the escarpment and between the escarpment and adjacent lands. Liaise with neighbours, Wollongong City Council and other organisations as needed, to encourage retention of vegetation connectivity between areas of the reserve. Promote conservation of suitable adjacent land.

5.3.2 Maintain management trail corridors in a manner that protects canopy linkages as far as possible. Encourage retention of native vegetation along road, railway and utility corridors to minimise habitat fragmentation.

5.3.3 Progressively assess encroachments and require removal where necessary.

5.3.4 Monitor the urban interface on a regular basis and implement strategies to manage issues as they arise.

5.3.5 Identify sites that are prone to rubbish or car dumping and deal with this as needed. Remove all dumped waste where practicable. Work with Wollongong City Council and other land management agencies to prevent illegal access and dumping.

5.3.6 Participate in coordinated agency processes and forums to promote cooperative management and minimisation of impacts on the park's boundaries.

5.4 Climate change

Human-induced climate change is listed as a key threatening process under the BC Act (NSW SC 2000a) and the associated loss of habitat is listed under the EPBC Act (TSSC 2001).

The latest information on projected changes to climate derive from the NSW and ACT Regional Climate Modelling (NARCliM) project (OEH 2014). The climate projections for 2020–39 are described as 'near future'; and projections for 2060–79 are described as 'far future'. The snapshot shown in Table 1 is for the Illawarra, which includes the Illawarra Escarpment State Conservation Area (OEH 2014).

The projected increases in temperature, number of hot days and severe fire weather days (OEH 2014) are likely to influence bushfire frequency and intensity across the Illawarra and result in an earlier start to the bushfire season. Higher rainfall in summer and autumn is likely to accelerate all forms of soil erosion across the region and increase runoff at these times of year, which, in turn, is likely to affect the stormwater system and, where capacity is reached, cause flooding (DECCW 2010).

Table 1: Illawarra climate change snapshot

Projected temperature changes	
Maximum temperatures are projected to **increase** in the near future by 0.4–0.9°C	Maximum temperatures are projected to **increase** in the far future by 1.6–2.3°C
Minimum temperatures are projected to **increase** in the near future by 0.4–0.7°C	Minimum temperatures are projected to **increase** in the far future by 1.5–2.4°C
The number of hot days (i.e. >35^{0}C) will **increase**	The number of cold nights (i.e. <2^{0}C) will **decrease**
Projected rainfall changes	
Rainfall is projected to **decrease** in winter	Rainfall is projected to **increase** in summer and autumn
Projected Forest Fire Danger Index changes	
Average fire weather is projected to **increase** in spring	Severe fire weather is projected to **increase** in summer and spring in the far future

Source: OEH 2014.

Climate change is likely to affect biodiversity significantly by changing population size and distribution of species, modifying species composition, and altering the geographical extent of habitats and ecosystems. Species most at risk are those unable to migrate or adapt, particularly those with small populations or with slow population growth rates.

The specific effects of climate change on the park are difficult to assess since they will depend on the compounding effects of other pressures, particularly barriers to migration and pressure from weeds and feral animals. However, it is likely that wetlands, moist open forest and rainforest will be under greater stress from fire and drought. Research at Maddens Plains has found swamp boundaries are highly sensitive to changes in climatic moisture and this has implications for wetland persistence under climate change (Keith et al. 2010).

It is likely that erosive rainfall events will be more common, negatively affecting water quality in creeks and streams. More intense rainfall events also have implications for increased landform instability on the escarpment.

Programs to reduce the pressures arising from other threats, such as habitat fragmentation, invasive species, bushfires and pollution, will help reduce the severity of the effects of climate change.

Desired outcome

- The impacts of climate change on natural systems, particularly wetlands and escarpment moist forests, are minimised.

Management response

5.4.1 Continue fire, pest and weed management, control of illegal track creation, habitat connectivity and other programs as set out in this plan, to increase the ability of native plants and animals to cope with future disturbances from climate change.

6. Management operations and other uses

NPWS management operations

NPWS management operations relate primarily to conservation and the provision of visitor facilities, and include fire management, introduced plant and animal control, rehabilitation and maintenance works. Infrastructure to assist with these functions includes:

- NPWS Illawarra Area work depot – located at Byarong Park, Mount Keira
- network of management trails – located throughout the park
- radio repeater – located on the communication tower on the council-managed Summit Park, Mount Keira.

Many of the management trails remain from previous land use and cross a number of land tenures, and some may not fulfil present-day management requirements. The trails require substantial reconstruction and repair every three to five years owing to the highly erodible nature of the escarpment soils and landscape. Maintenance of the trails is dependent on the purpose, funding and priorities of each organisation whose land they cross, and consequently individual sections are maintained to varying standards.

Access to several areas at the southern end of the park (Wongawilli section) is through private land and it would be desirable to formalise NPWS management access.

The NPWS Illawarra Area office, which manages the park, is currently located in the Wollongong Central Business District. There is potential to relocate the office to a site in the park, such as Byarong Park or another disturbed site with existing infrastructure. Any re-use or construction would be subject to heritage, environmental and financial analysis.

Infrastructure maintained by other organisations

The park contains infrastructure that is operated and maintained by other organisations. This includes:

- Mount Keira Scout Camp
- Mount Keira Guide Camp
- Illawarra Rhododendron Gardens
- rainwater tanks, reservoirs and pipelines that supply water to Mount Keira Summit Park, Mount Keira Scout Camp, the Guide Camp and the Port Kembla Mine houses
- gas and water pipelines managed by AGL, Jemena and Sydney Water
- electricity transmission lines and poles, and their corridors, managed by TransGrid and Endeavour Energy
- infrastructure managed by telecommunications companies, such as Optus and Telstra, including communications cables and towers
- mining infrastructure (including electricity transmission lines) managed by BHP Billiton and other mining interests
- trigonometric stations managed by the Department of Primary Industries
- Wollongong City Council powerlines supplying facilities at Mount Keira Summit Park and Sublime Point.

In addition, some structures located outside the park have essential access along park management trails, including a Sydney Water reservoir that supplies Mount Kembla village.

In order to manage the access and maintenance requirements for this infrastructure, NPWS is formalising agreements through memoranda of understanding, easements, licences and leases. These agreements aim to minimise the impacts of roads, utilities and similar infrastructure on the park.

Roads, utilities and similar infrastructure contribute to fragmentation of habitat and other park values. Reducing the impacts of fragmentation is critical to long-term conservation management, including infrastructure realignment, rehabilitation of non-essential infrastructure and avoiding the introduction of new infrastructure as far as possible.

As stated in Section 1.2, the Mount Keira Scout Camp, Mount Keira Guide Camp and Illawarra Rhododendron Gardens have guaranteed rights of occupancy in accordance with the original donation agreement with BHP Billiton. Relevant provisions of the plan of management apply within their areas but the detail of activities, operations, rights and responsibilities are set out in licences and environmental management plans for each organisation.

Community involvement

Both landowners and the community as a whole are stakeholders in the management of the Illawarra escarpment. Shared values and issues include amenity, conservation of natural and cultural values, fire management, weed and pest control and recreation and tourism infrastructure. NPWS draws on community knowledge about these issues to assist management and will continue to do so. NPWS also welcomes the involvement of volunteer groups in park management activities, such as track maintenance, monitoring, interpretation and rehabilitation of disturbed areas.

Desired outcomes

- Park management infrastructure meets operational requirements.
- Infrastructure maintained by other organisations has a minimal effect on the natural, cultural and scenic values of the park.

Management response

6.1 Maintain the management trail system as shown on the plan of management maps.

6.2 Seek to formalise access rights to the Wongawilli section for NPWS-authorised vehicles for management purposes.

6.3 Continue to honour the 1979 donation agreement, subject to:

- BHP Billiton's obligations under the donation agreement and legislation
- consideration, and protection as far as possible, of landscape, natural, cultural and recreational values.

6.4 Continue to permit operations of the Mount Keira Scout Camp, Mount Keira Guide Camp and Illawarra Rhododendron Gardens in accordance with their licences.

6.5 Identify all other non-NPWS infrastructure within the park or which uses park management trails for access, and ensure there is a lease, licence, easement or

agreement that covers use. Such agreements should include measures to protect park values, prevent pollution and avoid introduction of pests or fire.

6.6 Liaise with organisations that manage non-NPWS infrastructure in order to develop or update their environmental management plans.

6.7 Require removal and rehabilitation of any non-NPWS infrastructure that is no longer needed or is not covered by a lease, licence, easement or agreement.

6.8 Aim to avoid the introduction of new non-NPWS infrastructure into the park. As far as possible require any new essential and permissible infrastructure to use existing management trails and infrastructure routes identified in this plan of management. Where feasible, encourage realignment or modification of infrastructure under replacement to minimise its footprint.

6.9 Encourage the involvement of friends groups or other volunteer groups in park management activities.

6.10 Investigate the potential for locating an area office in the park, such as at the western end of Byarong Park adjacent to the NPWS work depot or another disturbed site with existing infrastructure. Should relocation occur, include sustainability design principles as far as possible.

7. Implementation

High priority activities are imperative to achieve the objectives and desired outcomes. They must be undertaken in the near future to avoid significant deterioration in natural, cultural or management resources.

Medium priority activities are necessary to achieve the objectives and desired outcomes but are not urgent.

Low priority activities are desirable to achieve the objectives and desired outcomes but can wait until resources become available.

Ongoing activities are carried out on a regular and routine basis or in response to an issue that arises.

Ecological conservation	Management response		Priority
Geology, landform, soils and hydrology	4.1.1	Conduct all activities in a manner that ensures the landscapes, geodiversity and scenic qualities of the park are protected and maintained. Minimise the impacts of developments in the park on the scenic views and the natural skyline.	Ongoing
	4.1.2	Consider the inherent instability of the escarpment landform and the erodibility of the park's soils in all aspects of management. Identify hazards resulting from land instability and soil erosion as needed and determine appropriate management. Actions may include monitoring, warning signage, remedial works, temporary or permanent closure of an area to the public, or relocation of visitor facilities. Work with licensees and other relevant parties to implement risk management occupancy plans where prepared.	Ongoing
	4.1.3	Engage as needed with other authorities, landowners, licensees and user groups to address matters that affect landscapes, scenic values, land stability or soil conservation in the park.	Ongoing
	4.1.4	Work with the Illawarra Coal Mining Interagency Group, the Department of Planning and Environment – Resources and Energy and other mining interest groups to assess and manage coal-wash emplacements and other areas affected by mining activities.	Ongoing
	4.1.5	Conduct all activities in the park in a manner that ensures that its catchments and water quality are protected and maintained.	Ongoing
	4.1.6	Avoid activities that threaten the soil conservation or catchment functions of the upland swamps.	Ongoing
	4.1.7	Do not allow water collection from within the park unless it is authorised under an existing lease or licence. Identify and liaise with relevant parties to stop unauthorised water extraction.	Medium
	4.1.8	Avoid vehicle use on management trails during periods of heavy rainfall.	Ongoing
	4.1.9	Close and rehabilitate disturbed areas and unauthorised or unnecessary tracks and trails (those not shown on the plan of management maps).	Medium
	4.1.10	Engage with other authorities and landowners as needed to address issues that affect catchments and water quality in the park.	Medium
	4.1.11	Encourage research on the geodiversity and geoheritage values of the Illawarra escarpment and adjacent plateau within the park, to identify significant geological and geomorphological features.	Low
Native plants	4.2.1	Implement relevant recovery actions in the *Biodiversity Conservation Program*, *Saving our Species* program, threat abatement plans and recovery plans for threatened plant species and endangered ecological communities occurring in the park, including survey, monitoring and bush regeneration programs. Where needed, alert road and track maintenance staff to the presence of threatened plants.	High

	4.2.2	Identify and implement other measures as needed to maintain plant biodiversity in the park, with a focus on populations of biogeographically significant species.	Ongoing
	4.2.3	Encourage further research on the park's vegetation, giving priority to the distribution, ecology and management needs of threatened species and communities.	Low
Native animals	4.3.1	Implement relevant recovery actions identified in the *Biodiversity Conservation Program*, *Saving our Species* program and recovery plans for threatened animal species and populations occurring in the park. Work with other government agencies and landowners to implement plans in a coordinated fashion.	High
	4.3.2	Identify and implement other measures as needed to maintain native animal biodiversity, with a focus on biodiversity restricted to escarpment habitats.	Ongoing
	4.3.3	Undertake surveys to check for the presence of threatened animals not yet recorded but for which the park provides core habitat.	Low
	4.3.4	Encourage research into the distribution and habitat requirements of threatened animals that occur within the park, including surveys of and collection of baseline data for invertebrate species.	Low
Cultural heritage	**Management response**		**Priority**
Aboriginal heritage	4.4.1	Actively engage with Aboriginal community organisations and individuals in identifying, protecting, monitoring and managing Aboriginal cultural heritage and when planning developments that could affect Aboriginal heritage.	Ongoing
	4.4.2	Undertake an archaeological survey and cultural assessment before undertaking any work with the potential to affect Aboriginal sites or values.	Ongoing
	4.4.3	In consultation with the Aboriginal community, investigate opportunities to survey and record Aboriginal sites in the park and conduct surveys as resources permit.	High
	4.4.4	As a means of recognising traditional connections of Aboriginal people to the area, give Aboriginal names to the park's visitor sites and trails where an appropriate name can be found, in consultation with the Aboriginal community.	Medium
	4.4.5	Support the naming, or dual naming, of landscape features with Aboriginal names in conjunction with Aboriginal communities and the NSW Geographical Names Board.	Ongoing
	4.4.6	Do not publicise the location of Aboriginal sites or other cultural information without the agreement of the Aboriginal community.	Ongoing
Post-1770 heritage	4.4.7	Implement the conservation management plan for the Mount Kembla Mine, including maintaining the pit-pony stables. Consider feasible options for adaptive re-use of the stables for education or another appropriate purpose. Manage the rest of the site as a ruin but address stability and encroaching vegetation.	Medium
	4.4.8	Finalise and implement a conservation management plan for the Mount Keira Scout Camp.	Medium
	4.4.9	Determine an appropriate management strategy for moveable heritage salvaged from the Mount Kembla Mine site. Investigate options for recovery and possible interpretation of the skips that remain on the site.	Medium
	4.4.10	Prepare and implement a conservation management plan for the Port Kembla No. 2 Mine site, including the Edna Walling precinct.	Medium
	4.4.11	Record and demolish the dilapidated Edna Walling house if it is not economically feasible to stabilise the slope and repair the house. Keep retaining walls and other durable features where possible, as a record of the house and the site.	Medium
	4.4.12	Continue to lease the remaining Edna Walling houses and gardens for residential accommodation, or consider adaptive re-use for tourist accommodation, education or other appropriate purposes, subject to the conservation management plan.	Medium
	4.4.13	Investigate the practicality and options for adaptive re-use of mine buildings at the Port Kembla No. 2 Mine for tourist accommodation, education or other appropriate purposes, subject to further geotechnical assessment and the conservation management plan.	Low

	4.4.14	Aim to maintain the stability and visibility of the World War II tank trap. Assess its conservation needs and implement any necessary actions.	Low
	4.4.15	Consider the Mount Kembla Mine, Port Kembla No. 2 precinct, including the Edna Walling house, and the World War II tank trap for nomination on the State Heritage Register.	Low
	4.4.16	Prepare heritage action statements for the stonework on historic roads to determine how they should be protected and managed.	Low
	4.4.17	Undertake archaeological assessments of the Tom Thumb and Southern mines to determine their significance. Prepare heritage action statements if needed.	Low
	4.4.18	Progressively assess the significance of other heritage sites, landscapes, places and objects in the park.	Low
	4.4.19	Develop heritage action statements for any other historic heritage that may warrant active management.	Low
	4.4.20	Remove vegetation growing in and around Nunans Cottage.	Medium
	4.4.21	Involve the community and other stakeholders in identifying and managing historic heritage. In particular, explore the possibility of partnerships for maintenance or restoration of the Edna Walling gardens.	Low
Visitor use and services	**Management response**		**Priority**
	4.5.1	Maintain Byarong Park as the major picnic area in the park, with tables, barbecues and toilets. Consider ways to make the community more aware of the picnic area and increase its amenity and level of use, for example through re-routing the access road to the work depot, signposting, provision of additional barbecues and tables, a short loop walk or a children's educational play facility.	Medium
	4.5.2	Review and update the walking track master plan to ensure sustainable walking opportunities are provided and the walking track system is enhanced through upgrading and constructing where needed.	High
	4.5.3	Work with Wollongong City Council and other stakeholders to integrate facilities within and outside the park, including improved parking, signage and information and, possibly, camping facilities.	Low
	4.5.4	Investigate opportunities for providing disabled access on the Woodward Track and the need for a new lookout.	High
	4.5.5	Improve the amenity and function of the Mount Kembla Lookout precinct.	Low
	4.5.6	Consider formalising a viewing point at the summit of the Mount Kembla Summit Track.	Low
	4.5.7	Trim vegetation to maintain views from the escarpment lookouts where needed or allow Wollongong City Council to undertake trimming to specified standards.	Ongoing
	4.5.8	Attempt to determine the location and record the condition of the Throsby Track within the park.	Low
	4.5.9	Improve access and parking at the Mount Kembla Mine site, to enable small-scale tourism to the top three terraces. Provide interpretation of the site. Assess the need for additional seating for tour groups. Investigate reinstating the park section of the historic Pit Track to the mine from Kembla Heights village, in conjunction with other landowners and organisations.	Low
	4.5.10	Permit walk-in camping at Austinmer Camp. Provide a toilet, picnic table and rainwater tank if warranted. Consider closing the site to walk-in camping if use becomes inappropriate.	Medium
	4.5.11	Investigate making Staffords Farm available for walk-in camping. Construct a basic toilet if warranted.	Low
	4.5.12	Prohibit camping elsewhere in the park except in special circumstances and where written consent is obtained, or in accordance with the Mount Keira Scout and Girl Guide Camp licences.	Ongoing

4.5.13	Prohibit wood fires in the park except for campfire circles permitted in the Mount Keira Scout and Girl Guide camps. Wood used for the campfire circles must be collected from outside the park.	Ongoing
4.5.14	Permit cycling on public access roads and management trails but continue to prohibit cycling on walking tracks. Close and rehabilitate unauthorised cycling trails. Conduct education campaigns to encourage cyclists to ride legally and minimise environmental impacts.	High
4.5.15	Promote shared track cycling protocols and safety messages on interpretive signs and other information.	Medium
4.5.16	Prepare and exhibit a mountain biking strategy to provide sustainable mountain bike single track in the park.	High
4.5.17	Implement the mountain biking strategy taking into consideration the outcomes of the environmental impact assessment and feedback from public exhibition.	Medium
4.5.18	Permit horse riding on public access roads, Farmborough Road Management Trail and those parts of the following management trails that are within the park: Bulli section of the Lower Escarpment Management Trail, Highlands Parade Trail, O'Briens Trail and Kembla Ring Management Trail.	Ongoing
4.5.19	Permit rock climbing and abseiling only on the south- and west-facing cliff lines of Mount Keira, as long as it is undertaken in a safe and environmentally acceptable manner.	Ongoing
4.5.20	Limit the size of group activities without written consent to: - cycling, including mountain biking: 20 people - horse riding: 8 horses - rock climbing: 4 per roped party - walk-in camping: 16 people - other activities: 20 people. Group size limits not requiring written consent will be monitored and adjusted based on impacts to the environment, visitor amenity and maintenance requirements. Group size limits at the Rhododendron Gardens and at the Scout and Guide camps are in accordance with their licences.	Ongoing
4.5.21	Prohibit hang-gliding and paragliding in the park.	Ongoing
4.5.22	Promote understanding and appreciation of the park's values, and visitor responsibility in protecting those values, including: - significant geological and geomorphological features - land stability and soil erosion issues - significant biodiversity, including rainforests and threatened species - Aboriginal cultural heritage, particularly of Mount Keira and Mount Kembla - historical heritage values, including the wide range of features and the significance of Mount Kembla Mine as the site of Australia's worst mine disaster.	Medium
4.5.23	Conduct community education programs as needed or in conjunction with other agencies and partners to promote awareness of the park, support for its protection, responsible use and knowledge of related conservation issues and behaviour such as living with wildlife and avoiding weed invasion.	Ongoing
4.5.24	Engage with stakeholder and community groups from a range of backgrounds to understand their expectations and needs and foster participation in park visitor opportunities. Target information and activities to particular groups where needed.	Ongoing
4.5.25	Encourage involvement of the Aboriginal community in the interpretation of Aboriginal heritage.	Ongoing
4.5.26	Undertake a program to ensure there is an adequate level of signage in the park, including directional, safety and interpretive information.	High

	4.5.27 Permit short-term community and commercial use of the park's modified natural areas and structures for purposes such as community and family events, private functions, appropriate sporting events, cultural events and filming. Any such use of the Mount Keira Scout Camp, Mount Keira Girl Guide Camp and Illawarra Rhododendron Gardens will need to be arranged with the licensee and be consistent with their licence conditions.	Ongoing
	4.5.28 Permit commercial tours and recreation activities, subject to NPWS licensing and other requirements for commercial use being met, and with minimal impacts on natural and cultural values or conflicts with other users.	Ongoing
	4.5.29 Monitor visitor use and the impacts of recreation activities on conservation values. If unacceptable impacts occur, undertake measures, such as education, law enforcement, or modification or closure of facilities, in discussion with user groups.	Medium
	4.5.30 Permit appropriate research and educational programs by other organisations in the park and encourage environmental education initiatives that promote a conservation ethic and sustainable visitor behaviour.	Ongoing
	4.5.31 Conduct regular joint law enforcement programs with other land managers and the NSW Police to minimise unauthorised trail-bike riding in the park.	Ongoing

Weeds and pest animals	**Management response**	**Priority**
	5.1.1 Manage pest animals and weeds in accordance with pest management strategies relevant to the park.	High
	5.1.2 Limit visitor and other activities to areas already disturbed, as far as possible, to avoid creating new areas for weed invasion.	Ongoing
	5.1.3 Manage introduced plants in culturally sensitive significant landscapes in accordance with the Burra Charter.	Ongoing
	5.1.4 Manage threats from plant pathogens in accordance with statewide guidelines. Ensure risk-based plant pathogen hygiene protocols are observed for all management activities, including those of other authorities.	Ongoing
	5.1.5 Use locally indigenous plant species, as far as practical, for all landscaping purposes in the park.	Ongoing
	5.1.6 Coordinate pest and weed management programs in the park with licensees, other authorities and landowners and with volunteer bush regeneration groups.	Ongoing
Fire management	**Management response**	**Priority**
	5.2.1 Manage fire in accordance with the fire management strategy for the park.	Ongoing
	5.2.2 Consider natural fire regime thresholds and measures to protect biodiversity, cultural heritage, land stability, recreation and research values in bushfire planning and management, including ecological burns. Exclude fire from rainforests and other fire-sensitive vegetation.	High
	5.2.3 Limit the use of fire as a method of hazard reduction on the escarpment slopes. Mechanical slashing is preferred.	Ongoing
	5.2.4 Wherever possible, avoid the use of heavy machinery for fire suppression in wetlands, rainforest, endangered ecological communities and areas with threatened plant species or archaeological sites. Avoid use of salt water or foam in wetlands and areas of endangered ecological communities or threatened plant species.	Ongoing
	5.2.5 Maintain asset protection zones to protect assets in and adjacent to the park, in accordance with the park fire management strategy.	Medium
	5.2.6 Engage with neighbours and other stakeholders with regard to bushfire asset protection.	Ongoing
	5.2.7 Continue to participate in cooperative fire management planning and operations, primarily through involvement in local bush fire management committees.	Ongoing

Habitat fragmentation and boundary issues	Management response	Priority
	5.3.1 Encourage the maintenance of habitat connectivity along the escarpment and between the escarpment and adjacent lands. Liaise with neighbours, Wollongong City Council and other organisations as needed, to encourage retention of vegetation connectivity between areas of the reserve. Promote conservation of suitable adjacent land.	Ongoing
	5.3.2 Maintain management trail corridors in a manner that protects canopy linkages as far as possible. Encourage retention of native vegetation along road, railway and utility corridors to minimise habitat fragmentation.	Ongoing
	5.3.3 Progressively assess encroachments and require removal where necessary.	Medium
	5.3.4 Monitor the urban interface on a regular basis and implement strategies to manage issues as they arise.	Medium
	5.3.5 Identify sites that are prone to rubbish or car dumping and deal with this as needed. Remove all dumped waste where practicable. Work with Wollongong City Council and other land management agencies to prevent illegal access and dumping.	Low
	5.3.6 Participate in coordinated agency processes and forums to promote cooperative management and minimisation of impacts on the park's boundaries.	Low
Climate change	**Management response**	**Priority**
	5.4.1 Continue fire, pest and weed management, control of illegal track creation, habitat connectivity and other programs as set out in this plan, to increase the ability of native plants and animals to cope with future disturbances from climate change.	Ongoing
Infrastructure & maintenance	**Management response**	**Priority**
	6.1 Maintain the management trail system as shown on the plan of management maps.	Ongoing
	6.2 Seek to formalise access rights to the Wongawilli section for NPWS-authorised vehicles for management purposes.	Low
	6.3 Continue to honour the 1979 donation agreement, subject to: - BHP Billiton's obligations under the donation agreement and legislation - consideration, and protection as far as possible, of landscape, natural, cultural and recreational values.	Ongoing
	6.4 Continue to permit operations of the Mount Keira Scout Camp, Mount Keira Guide Camp and Illawarra Rhododendron Gardens in accordance with their licences.	Ongoing
	6.5 Identify all other non-NPWS infrastructure within the park or which uses park management trails for access, and ensure there is a lease, licence, easement or agreement that covers use. Such agreements should include measures to protect park values, prevent pollution and avoid introduction of pests or fire.	Low
	6.6 Liaise with organisations that manage non-NPWS infrastructure in order to develop or update their environmental management plans.	Medium
	6.7 Require removal and rehabilitation of any non-NPWS infrastructure that is no longer needed or is not covered by a lease, licence, easement or agreement.	Ongoing
	6.8 Aim to avoid the introduction of new non-NPWS infrastructure into the park. As far as possible require any new essential and permissible infrastructure to use existing management trails and infrastructure routes identified in this plan of management. Where feasible, encourage realignment or modification of infrastructure under replacement to minimise its footprint.	Ongoing

	6.9	Encourage the involvement of friends groups or other volunteer groups in park management activities.	Low
	6.10	Investigate the potential for locating an area office in the park, such as at the western end of Byarong Park adjacent to the NPWS work depot or another disturbed site with existing infrastructure. Should relocation occur, include sustainability design principles as far as possible.	Low

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9. Appendices

Appendix 1. Vegetation communities recorded in the park

Landform – subunit	Vegetation community	High conservation value[1]
Escarpment – Foothills	Moist Box – Red Gum Foothills Forest	A2 C
	Lowland Dry Subtropical Rainforest	A1 B C D
	Coastal Grassy Red Gum Forest	A2 B C
	Acacia Scrub (regrowth)	
Escarpment – Slopes	Escarpment Blackbutt Forest	
	Moist Gully Gum Forest	
	Illawarra Escarpment Subtropical Rainforest (closely related to Lowland Dry Subtropical Rainforest)	A1 B C D
	Escarpment Moist Blue Gum Forest	C
	Moist Coastal While Box Forest	
	Coachwood Warm Temperate Rainforest	
Escarpment – Cliffs	Cliff Line Coachwood Scrub	B C
Plateau	Budawang Ash Mallee Scrub	B
	Exposed Sandstone Scribbly Gum Woodland	
	Escarpment Edge Silvertop Ash Open Forest	
	Sandstone Gully Apple – Peppermint Forest	
	Upland Swamp: Banksia Thicket	A4 E
	Upland Swamp: Sedgeland–Heath Complex	A4 E
	Upland Swamp: Tea-tree Thicket	A4 E
	Moist Gully Gum Forest	
	Escarpment Blackbutt Forest	
	Moist Blue Gum – Blackbutt Forest	
	Tall Blackbutt Apple Shale Forest	A3 B C D

[1] High conservation values:
A = Component of a listed endangered ecological community (Biodiversity Conservation Act): A1 = Illawarra Subtropical Rainforest in the Sydney Basin Bioregion; A2 = Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion; A3 = Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion; A4 = Coastal Upland Swamp in the Sydney Basin Bioregion.
B = Rare (NPWS 2003), with <1000 hectares in the bioregion.
C = Poorly reserved (NPWS 2003), with <30% protected in reserves.
D = Restricted to the Illawarra.
E = Potential Ramsar wetland (NPWS 2003).
Source: Wollongong Local Government Area Bioregional Assessment (NPWS 2002a, 2003).

Appendix 2. Rare or threatened plants recorded in the park

Species	Status [A]			Habitat (locations where recorded within the park) [B]
	BC Act	EPBC Act	ROTAP	
Arthropteris palisotii	E			Coachwood Warm Temperate Rainforest (Mount Keira)
				Illawarra Escarpment Subtropical Rainforest [B]
Asplenium aethiopicum			R	Coachwood Warm Temperate Rainforest (Mount Keira)
Blandfordia cunninghamii			R	Illawarra Escarpment Subtropical Rainforest (Mount Kembla)
Cynanchum elegans	E	E		Acacia Scrub (Mount Keira)
				Lowland Dry Subtropical Rainforest [B]
				Moist Coastal White Box Forest [B]
Daphnandra johnsonii	E			Moist Coastal White Box Forest [B]
				Lowland Dry Subtropical Rainforest [B]
				Illawarra Escarpment Subtropical Rainforest [B]
Darwinia diminuta			R	Exposed Sandstone Scribbly Gum Woodland (Maddens Plains)
Darwinia grandiflora			R	Sandstone outcrops in Upland Swamps (Maddens Plains)
				Exposed Sandstone Scribbly Gum Woodland (Sublime Point)
Epacris coriacea			R	Exposed Sandstone Scribbly Gum Woodland (Bulli, Austinmer, Mount Keira, Mount Kembla, Stanwell Park)
Eucalyptus apiculata [D]			R	Rock Plate Mallee Heath and slight rises within Upland Swamps (Austinmer)
Eucalyptus luehmanniana			R	Upland Swamps: Sedgeland–Heath Complex (Maddens Plains)
Gonocarpus salsoloides			R	Upland Swamps: Sedgeland–Heath Complex (Sublime Point)
Grevillea longifolia			R	Sandstone Gully Apple – Peppermint Forest [B]
Haloragis exalata subsp. *exalata* var. *exalata*	V	V		Coachwood Warm Temperate Rainforest (Stanwell Park, Coalcliff)
				Lowland Dry Subtropical Rainforest [B]
Hibbertia nitida			R	Escarpment Blackbutt Forest (Bulli, Austinmer)
Irenepharsus trypherus [C]	E	E		Moist Box – Red Gum Foothills Forest [B]
Lomandra brevis			R	Escarpment Edge Silvertop Ash Forest [B]
Lomandra fluviatilis			R	Plateau communities in the beds of sandstone watercourses [B]
Monotoca ledifolia			R	Rock Plate Heath within Upland Swamp (Sublime Point)
Pomaderris adnata	E			Exposed Sandstone Scribbly Gum Woodland (Bulli, Austinmer)
				Escarpment Edge Silvertop Ash Forest (Bulli, Austinmer, & highly restricted population around Sublime Point)
Pultenaea aristata	V	V		Coachwood Warm Temperate Rainforest (Mount Keira)
				Sandstone Gully Apple – Peppermint Forest [B]
				Exposed Sandstone Scribbly Gum Woodland [B]
				Tall Open Blackbutt Forest [B]
Solanum celatum	E			Illawarra Escarpment Subtropical Rainforest (Kembla Heights)
Sphaerocionium lyallii			R	Coachwood Warm Temperate Rainforest [B]
Syzygium paniculatum [C]	V	V		Illawarra Escarpment Subtropical Rainforest (Coalcliff)

[A] BC Act = Biodiversity Conservation Act; EPBC Act = Environment Protection and Biodiversity Conservation Act; ROTAP = Rare or Threatened Australian Plant (Briggs & Leigh 1996); E = endangered, V = vulnerable; R = Rare or threatened.

[B] Location not recorded, but potential habitat identified (NPWS 2002a).

[C] Recovery plans prepared.

[D] The species considered *Eucalyptus apiculata* in Illawarra Escarpment State Conservation Area may in fact be a narrow-leafed form of *Eucalyptus stricta*.

Appendix 3. Threatened animal species recorded in the park

Common name	Scientific name	Status [A]	
		BC Act	EPBC Act
Giant burrowing frog	*Heleioporus australiacus*	V	V
Green and golden bell frog	*Litoria aurea*	E	V
Littlejohn's tree frog	*Litoria littlejohni*	V	V
Red-crowned toadlet	*Pseudophryne australis*	V	
Stuttering frog	*Mixophyes balbus*	E	V
Broad-headed snake	*Hoplocephalus bungaroides*	E	V
Rosenberg's goanna	*Varanus rosenbergi*	V	
Barking owl	*Ninox connivens*	V	
Gang-gang cockatoo	*Callocephalon fimbriatum*	V	
Glossy black-cockatoo	*Calyptorhynchus lathami*	V	
Masked owl	*Tyto novaehollandiae*	V	
Olive whistler	*Pachycephala olivacea*	V	
Powerful owl	*Ninox strenua*	V	
Rose-crowned fruit-dove	*Ptilinopus regina*	V	
Sooty owl	*Tyto tenebricosa*	V	
Sooty oystercatcher	*Haematopus fuliginosus*	V	
Eastern bentwing-bat	*Miniopterus schreibersii oceanensis*	V	
Eastern false pipistrelle	*Falsistrellus tasmaniensis*	V	
Grey-headed flying-fox	*Pteropus poliocephalus*	V	V
Koala	*Phascolarctos cinereus*	V	V
Spotted-tailed quoll	*Dasyurus maculatus*	V	E

[A] BC Act = Biodiversity Conservation Act; EPBC Act = Environment Protection and Biodiversity Conservation Act; E = endangered; V = vulnerable.

Appendix 4. Historical heritage features in the park

Colonial roads

- The Bullock Track (c. 1820), above Stanwell Park; some early stonework remains.
- Westmacotts Road (1844), from Austinmer to the mountain above Bulli, via Westmacotts Pass, now known as Bulli Pass.
- Throsbys Track (c. 1815), south of Bulli Pass. The Lower Escarpment Management Trail may follow part of this track; some early stonework remains.
- Mitchells Road (c. 1835), the original Mount Keira Road, was constructed by convict labour following survey by Surveyor General Thomas Mitchell. Part of the original route is in the park near the junction with Queen Elizabeth Drive. Some early stonework remains.
- O'Briens Road (c. 1821), from Figtree to Mount Nebo. Has some early stone walls and a stretch of cobblestone road, although much of the cobblestone surface has been covered with coal-wash or other material to improve vehicle access.
- Bridle Track, on the southern side of Mount Kembla; was used to take produce from local farms to Port Kembla in the late 1800s.
- Bong Bong Pass, Wongawilli. The pass was recorded by Charles Throsby Smith in 1820 and a bridle track was formed that led to Bong Bong on the Southern Tablelands. The upper section has some stone retaining walls, an old stone trough and pavement.

Agricultural and house sites

- Two large fig trees, bricks, corrugated iron and cleared areas on the Mount Keira Ring Track mark the site of McGoldricks Farm.
- The Ring Property, above the Mount Keira Scout Camp, is marked by some fruit and ornamental trees and pieces of corrugated iron.
- Opposite the entrance Scout camp, in the large paddock, stood the Russell's property. Mrs Russell operated a small tuckshop, offering basic refreshments to passers-by.
- The Swan house (Mount Keira) was originally a miner's cottage, built by the mine's carpenter. It had extensive paddocks with dry stone walls across the bench in the escarpment (J. Swan 1997, pers. comm.).
- The remains of Staffords Farm (north of Kembla Heights) consist of dry stone walls and house and garden ruins set in a clearing.
- A bench above the Mount Kembla Mine supports the remains of farm buildings, gardens and animal pens.
- Benjamins Farm, on the Mount Kembla Ring Track, is marked by a stone fireplace, dry stone walls, concrete slab, a large concrete water tank and the remnants of former orchards.
- Nunans Cottage (Wongawilli), also known as 'Seaview', was a rare, well-crafted sandstone farmhouse, but is now a ruin, with associated, collapsed stone and corrugated iron outbuildings, dating from an 1850s land grant. The stone walls of the cottage remain.

Mining

- Remains of miners' houses at Austinmer.
- Remains of a mining village for the Bulli Mine, known as Pit Town, now in ruins and overgrown by vegetation.
- Old powerlines that served mines at Bulli and Corrimal.
- The Rhododendron Gardens are on former BHP Billiton land that contained the Mount Pleasant Mine managers' cottages and grazing areas for pit ponies. Stone walls and troughs remain and it is thought there is a buried adit.
- Geordies Flat, Mount Keira, contained slab-constructed cottages and was served by an extension of the early road. Many of the miners working the Mount Keira Mine lived here (J. Swan 1997, pers. comm.). There are no remains.
- Byarong Park and the adjacent Girl Guide Camp originally housed the pit ponies for the Keira Mine (located above the present Kemira Mine). Large wooden stables and a house were located on the current area of the Guide camp and the current Byarong Park was used for grazing. Explosives for the mine were also stored at Byarong Park (J. Swan 1997, pers. comm.). After World War II, a Diggers Rest Home was located at the site. The only remains of these features are trees and gate posts at the site of the rest home.
- The Tom Thumb Mine, Kembla Heights, dates from 1968 and has some structural remains, including concrete slabs, access road, bridge, substantial drainage, tiles and surface scatters.
- The remains of the Mount Kembla Mine include: pit-pony stables, bath-house slab, explosives magazine, machinery shop footings, remains of a mine air shaft, mine portal and mine workings, remains of miners' cottages, rail tracks, trolleys and other items. The pit-pony stables are in reasonable condition but most of the rest of the items are in poor shape or are ruins.
- Southern Mine at Mount Kembla: three stone mine portals in good condition and a tramway formation, dating from 1888.
- The remains of the Port Kembla No. 2 (PK2) Mine at Kembla West include: washrooms, boiler room, pit-pony stables, administration block and associated rail tracks and other features. The structures are in a run-down condition, apart from the stables which were restored in 2009.
- Four houses (built in 1947) adjacent to the Port Kembla No. 2 Mine, built to provide accommodation for the mine managers, plus a tennis court constructed in the 1970s. The layout and gardens were designed by landscape architect Edna Walling and the houses (and possibly mine buildings) were designed by Alison Norris. Three of the houses are still occupied but the fourth is currently vacant. It is on an unstable slope and in a dilapidated condition.
- All known mine portals have been sealed.

Recreation and education

- A road formation known as Lady Carrington Drive was constructed from Mount Kembla Lookout part-way to the summit in the late 1800s. The track could not be completed owing to the difficult topography and was never used.
- Early walking tracks still in use include the Sublime Point Track (c. 1916) and the Dave Walsh Track (c. 1939).

- The Mount Keira Scout Camp, located on the southern slopes of Mount Keira, was established in 1939. It contains a number of buildings set in a series of clearings designed by landscape architect Paul Sorensen.
- The nearby Mount Keira Girl Guide Camp, established in 1970, also contains buildings of potential heritage interest.
- The Illawarra Rhododendron Gardens at Mount Pleasant were established in 1969.
- The former Port Kembla No. 2 Mine administration buildings were leased by the Department of Education as the Kembla Field Studies Centre from 1989 to 1998.

World War II

- Part of a World War II tank trap that ran from Mount Kembla to Port Kembla (Perkins Beach), via Lake Illawarra. It was constructed to prevent a Japanese attack on the Port Kembla steel works. Most was filled in after the war but several hundred metres remain on the park. The trap consists of a U-shaped ditch about 6 metres deep and 4 metres wide, with timber supports.
- The Girl Guide Camp site is reported to have formerly contained buildings used to house American servicemen during the war.

Appendix 5. Listed European heritage in the park

Heritage item	Location	NSW State Heritage Inventory [A]	National Trust of Australia	Wollongong LEP [B]
Illawarra Escarpment	All		Listed	
Pit Town remains	Bulli			Local
Port Kembla No. 2 Mine houses and gardens, Farmborough Road	Farmborough Heights	Listed	Listed	Local
Port Kembla No. 2 Mine pit-pony stables	Farmborough Heights	Listed		Local
Mount Keira Scout Camp	Mount Keira			Local
Mount Kembla Mine	Mount Kembla	Listed	Listed	Local
Mount Kembla Mine pit-pony stables	Mount Kembla	Listed	Listed	Local
Nunans Cottage	West Dapto	Listed		
Bong Bong Pass	Wongawilli			Local

[A] The NSW State Heritage Inventory comprises items listed by local government and State agencies.
[B] Wollongong LEP = *Wollongong Local Environmental Plan 2009* (NSW Government 2009). Local = items of local significance.

The Mount Kembla Mine, Port Kembla No. 2 Mine complex and the World War II tank trap (see Appendix 4) are being considered for nomination to the State Heritage Register.

Other historic heritage items are described in Section 4.5 and Appendix 4.

Appendix 6. Significant weeds in the park

Common name	Scientific name	State priority weed [A]	Regional priority weed [A]	Local priority weed [A]	WONS [B]
State priority weeds [A]					
African boxthorn	*Lycium ferocissimum*	Asset protection			✓
Bitou bush	*Chrysanthemoides monilifera* subsp. *rotundata*	Containment			✓
Blackberry	*Rubus fruticosus* agg.	Asset protection		✓	✓
Bridal creeper	*Asparagus asparagoides*	Asset protection		✓	✓
Ground asparagus	*Asparagus aethiopicus*	Asset protection		✓	✓
Lantana	*Lantana camara*	Asset protection			✓
Serrated tussock	*Nassella trichotoma*	Asset protection	Containment		✓
Regional priority weeds [A]					
African lovegrass	*Eragrostis curvula*		Asset protection		
Mysore thorn	*Caesalpinia decapetala*		Containment		
Pampas grass	*Cortaderia* spp.		Eradication	✓	
Local priority weeds [A]					
Cape ivy	*Delairea odorata*			✓	
Crofton weed	*Ageratina adenophora*			✓	
Madeira vine	*Anredera cordifolia*			✓	✓
Morning glory	*Ipomoea indica*			✓	
Moth vine	*Araujia sericifera*			✓	
Tree of heaven	*Ailanthus altissima*			✓	
Other significant weeds					
Coral tree	*Erythrina* x *sykesii*				
Easter cassia	*Senna pendula* var. *glabrata*				
Large-leaved privet	*Ligustrum lucidum*				
Mistflower	*Ageratina riparia*				
Mother of millions	*Bryophyllum* spp. and hybrids				
Small-leaved privet	*Ligustrum sinense*				
Trad	*Tradescantia fluminensis*				

[A] Priority of weeds as per South East LLS (2017).
[B] WONS = Weeds of National Significance (http://environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html).

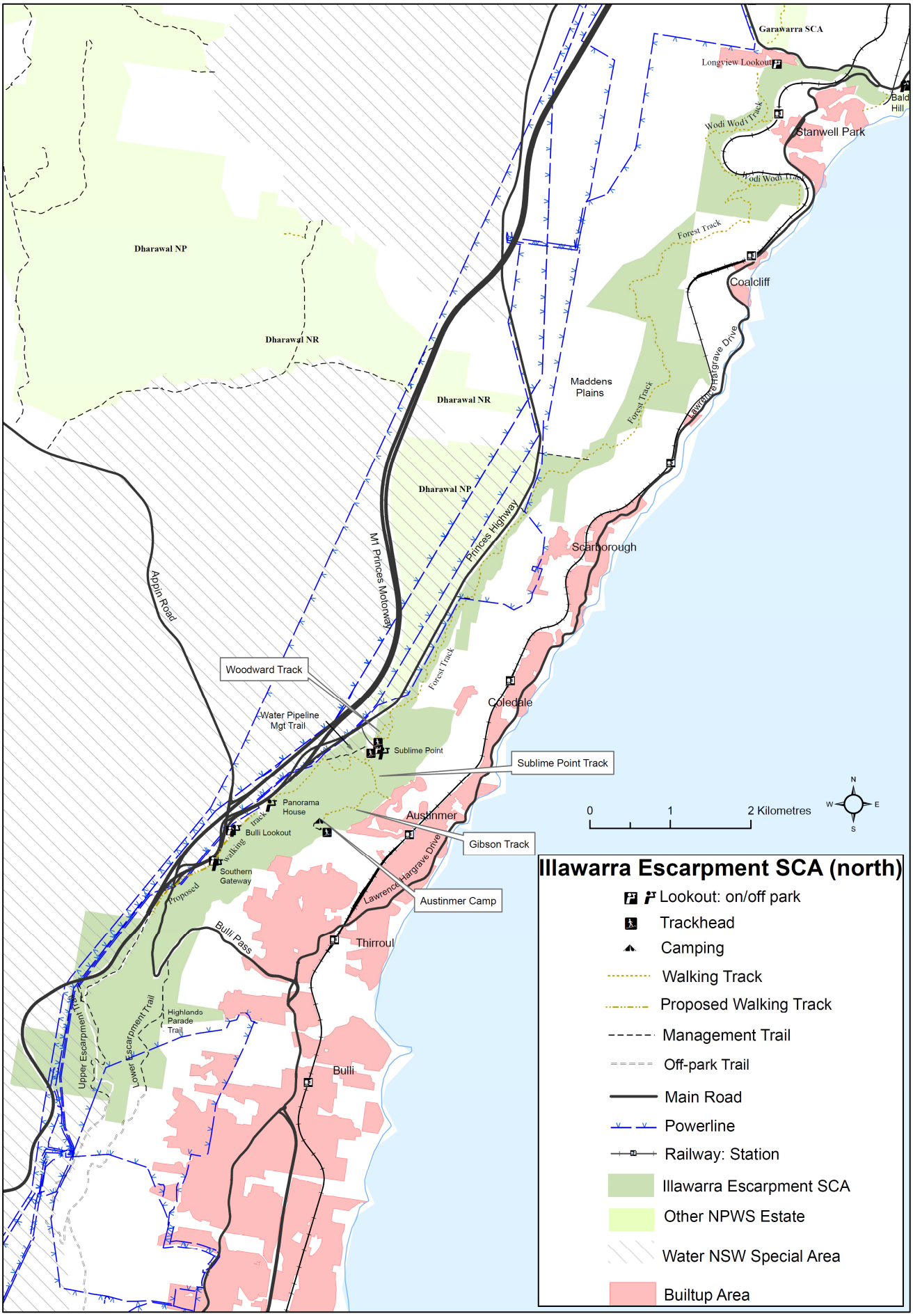

Figure 3: Illawarra Escarpment State Conservation Area (north)

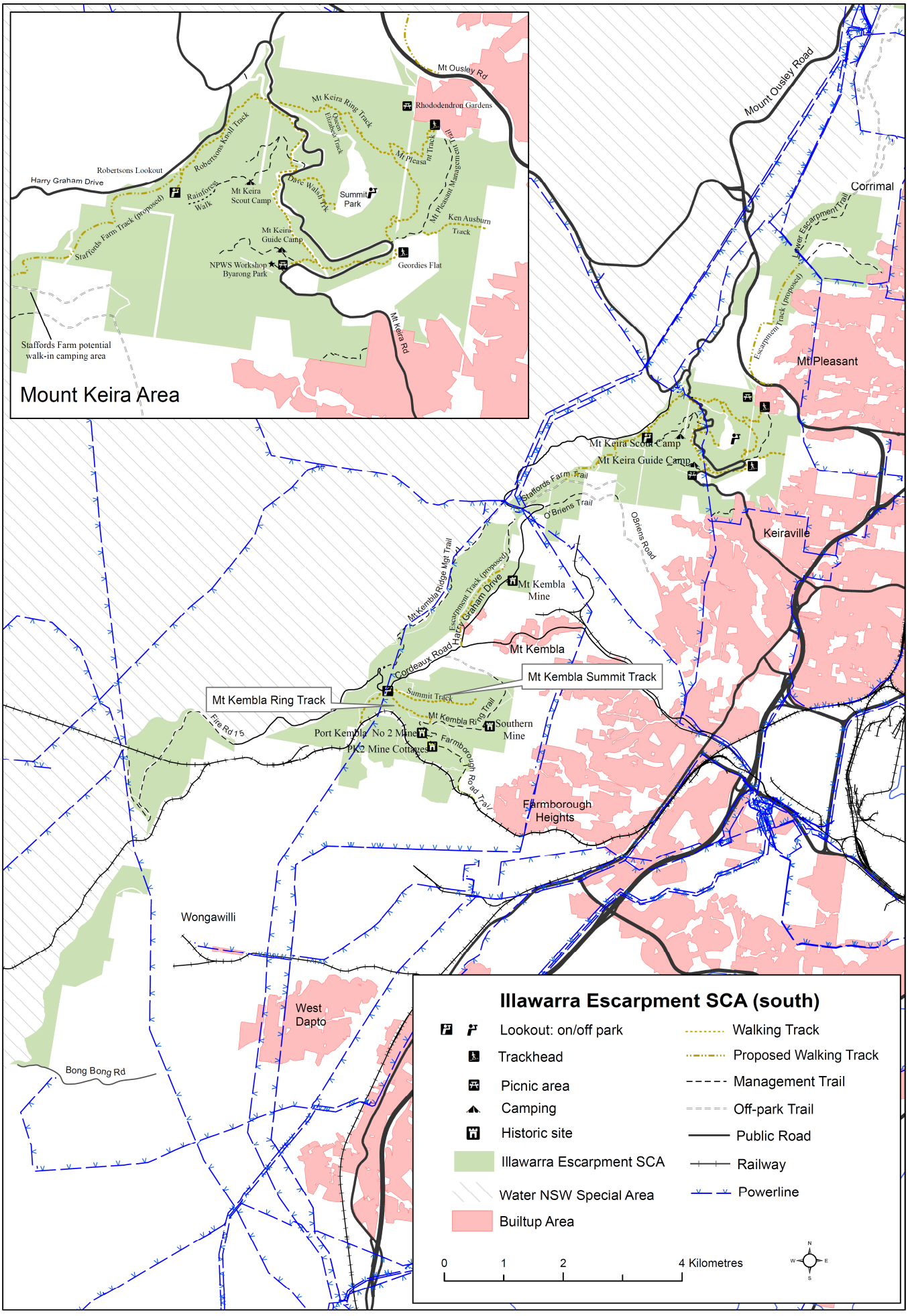

Figure 4: Illawarra Escarpment State Conservation Area (south)