



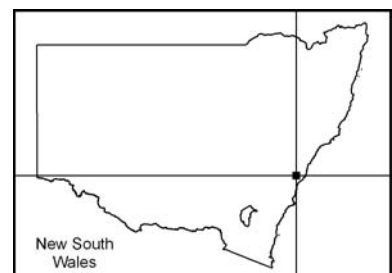
Office of  
Environment & Heritage  
NSW National Parks & Wildlife Service



# Draft Plan of Management



## Leacock Regional Park





# Leacock Regional Park Draft Plan of Management

**NSW National Parks and Wildlife Service**

**September 2012**

## **Acknowledgments**

This plan of management was prepared by staff of the Metropolitan Branch of the NSW National Parks and Wildlife Service (NPWS), part of the Office of Environment and Heritage.

The NPWS acknowledges that Leacock Regional Park is in the traditional country of the Darug Aboriginal people.

**Cover Photo:** Leacock Regional Park.  
Photo: Isabelle Connolly NPWS

For additional information or any inquiries about this Park or this plan of management, contact the NPWS Cumberland South Area Office, Bents Basin State Conservation Area, Wolstenholme Ave, Greendale, NSW, 2745 or by telephone on (02) 4774 8662.

**Disclaimer:** This publication is for discussion and comment only. Publication indicates the proposals are under consideration and are open for public discussion. Any statements made in this draft publication are made in good faith and do not render the Office of Environment and Heritage (OEH) liable for any loss or damage. Provisions in the final management plan may not be the same as those in this draft plan.

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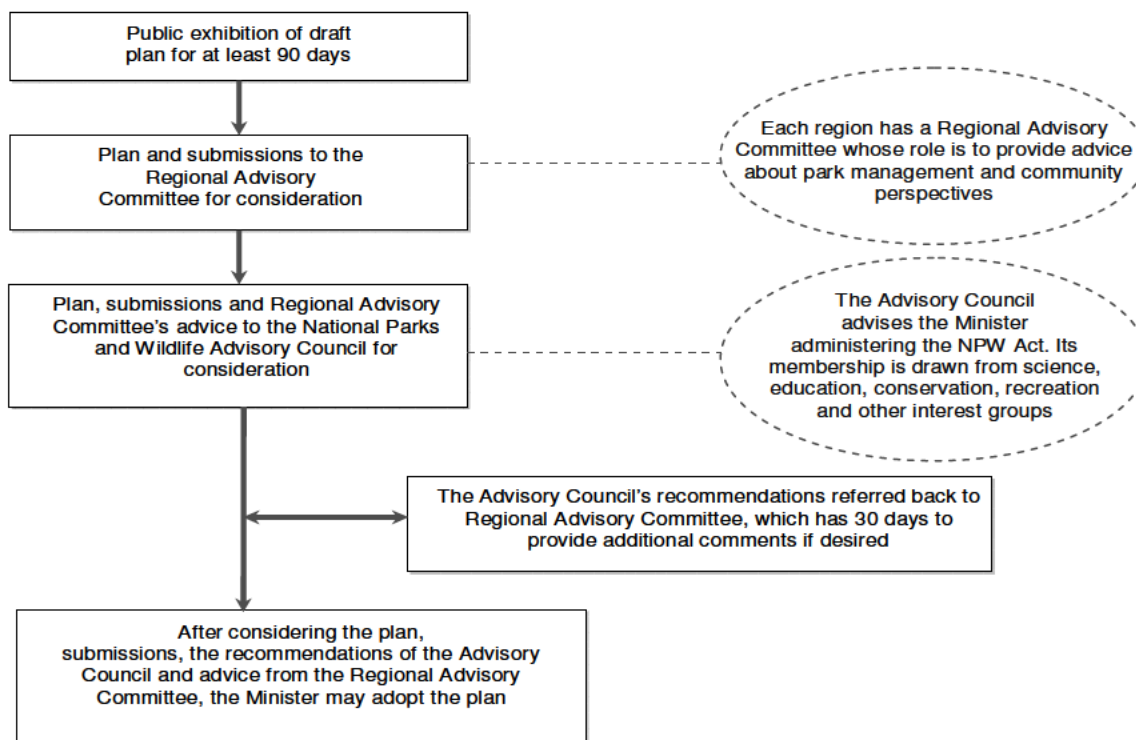
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## Invitation to Comment

The *National Parks and Wildlife Act 1974* (NPW Act) requires that a plan of management be prepared that outlines how an area will be managed by the NSW National Parks and Wildlife Service (NPWS).

The procedures for the exhibition and adoption of plans of management are specified under Part 5 of the NPW Act and involve the following stages:



This draft plan has been developed with input from local community members and key stakeholders and is now being placed on public exhibition for comment. Members of the public, whether as individuals or as members of community interest groups, are invited to comment in writing on this plan of management.

**The draft plan is on exhibition until Monday 21<sup>st</sup> January 2013.**

Submissions must be received by 21<sup>st</sup> January and can be made by:

- i) Writing to The Area Manager, Cumberland South, NPWS, PO Box 95, Parramatta NSW 2124.
- ii) Submitting comments on-line at [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au); or
- iii) E-mailing your submission to [msw.planning@environment.nsw.gov.au](mailto:msw.planning@environment.nsw.gov.au)

To make consideration of your submission as effective as possible it would help us if you:

- Identify the section heading and number to which your comment relates; and
- Briefly explain the reason for your comment and, if appropriate, suggest other ways to address the issue.

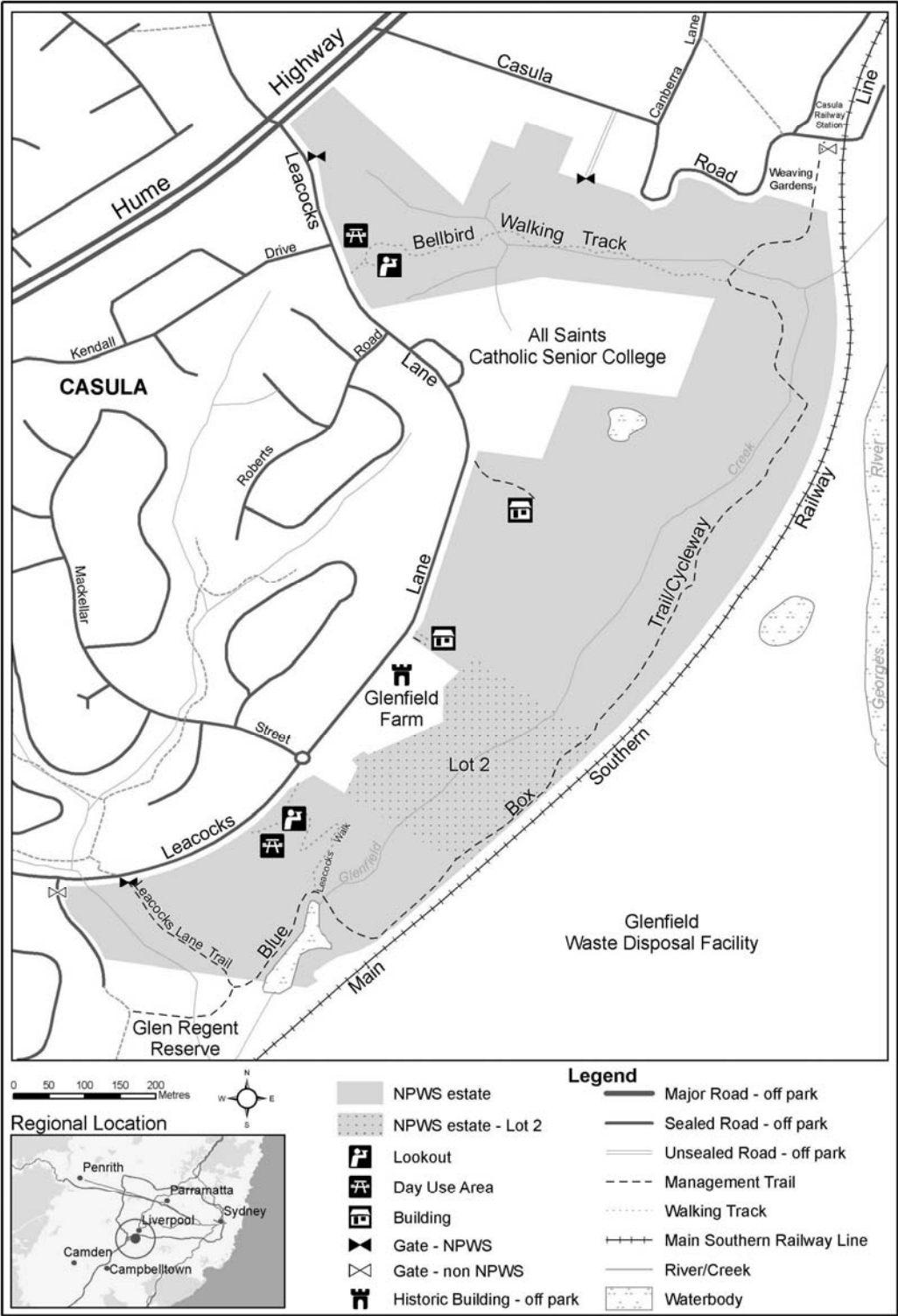
All submissions received by NPWS are a matter of public record and are available for inspection upon request. Your comments on this draft plan may contain information that is defined as "personal information" under the *NSW Privacy and Personal Information Protection Act 1998*. The submission of personal information with your comments is voluntary.



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Map of Leacock Regional Park





# 1. Introduction

## 1.1 Location, gazettal and regional setting

Features	Description
<b>Leacock Regional Park</b>	
Location	Leacock Regional Park (referred to as ‘the Park’ in this plan) is located approximately 35 kilometres west of the Sydney central business district and 4 kilometres south of Liverpool City centre.
Area	The Park is 38.49 hectares and is generally rectangular in shape with two significant indentations on the western side being Glenfield Farm estate and All Saints Catholic Senior College. The Park is wider on the northern boundary and narrower to the south.
Reservation Date	<p>The Park was reserved on 5 September 1997. On 12 October 2001, Lot 7098 DP 847351, comprising 1,657 square metres was added to the Park and on 23 September 2011, Lot 2 DP 1126484, comprising 4.3 hectares was added to the Park.</p> <p>In 2008, a section of the Park (1,564 square metres, being Lot 2 in DP 1123827) was revoked under the <i>National Parks and Wildlife (Leacock Regional Park) Act 2008</i> to make way for the construction of the Southern Sydney Freight Line.</p>
Previous Tenure	<p>The Park was originally part of Glenfield Farm, established by Dr Charles Throsby from 1810. The land was gradually subdivided over time and parts were used for grazing, farming and sandmining.</p> <p>The NSW Department of Planning (DOP) owned the northern portion of the Park and Landcom owned the southern portion prior to the establishment of the Park in 1997. In August 2010, 4.3 hectares (Lot 2 DP 1126484) was added to the reserve. The land was owned by the DOP and was subdivided from the portion of land containing the Glenfield Farm buildings. The historic buildings on Lot 1 DP 1126484 have since been restored by the Historic Houses Trust for resale as a private residence.</p>
<b>Regional Context</b>	
Biogeographic Region	<p>The Park is situated within the Sydney Basin Bioregion.</p> <p>The Park is part of a larger network of protected lands in western Sydney that includes William Howe Regional Park, Gulguer Nature Reserve and Bents Basin State Conservation Area to the south-west and Kemps Creek Nature Reserve, Mulgoa Nature Reserve and Western Sydney Regional Park to the west/north-west.</p>
Surrounding Land Use	The Park is bounded by the Main Southern Railway Line to the east/south-east; Liverpool Council-owned Glen Regent Reserve to the south; Leacocks Lane, Glenfield Farm and All Saints Catholic Senior College to the west; the Hume Highway to the north-west; and Casula Road, the Liverpool Council-

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owned Weaving Garden and urban dwellings to the north. Casula Railway Station and Casula Powerhouse Arts Centre are located to the north-east of the Park and the Georges River and Glenfield Waste Disposal facility are located to the east of the Main Southern Railway Line.

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Other Authorities	The Park is situated within the area of the Tharawal Local Aboriginal Land Council and abuts the area of the Gandangara Local Aboriginal Land Council. The Park is also located within the area of the Sydney Metropolitan Catchment Management Authority and Liverpool City Council.
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## 1.2 Statement of significance

Leacock Regional Park is considered to be of significance for:

### Landscape / Catchment Values

- A varied and diverse landscape is found in the Park, from bushland in the north, to the historic rural landscape of Glenfield Farm in the central and southern portions. This landscape provides interest, diversity and a relatively natural setting for people visiting and living in the area.
- The Park provides a locally significant escarpment allowing for panoramic views from the ridgeline eastwards over the Holsworthy bushland and to the Sydney city skyline.
- The Park contributes to water quality and hydrology outcomes for the Georges River as it encompasses much of the upper catchment of Glenfield Creek, which flows into the river near Casula Railway Station.

### Biological

- A range of vegetation is found in the Park including critically endangered Cumberland Plain Woodland ecological community, endangered River-Flat Eucalypt Forest on Coastal Floodplains ecological community, endangered Swamp Oak Floodplain Forest ecological community, native and exotic grasses, natural and artificial wetlands and indigenous plantings.
- The Park links to a wildlife movement corridor along the Georges River and south-east to the extensive bushland of Holsworthy Military Reserve.
- The Park provides habitat for threatened fauna species listed under the *Threatened Species Conservation Act* (TSC Act).
- The Park conserves fauna assemblage representative of remnant Cumberland Plain fauna which was once more widespread.
- Along Glenfield Creek, the Park contains old growth trees that are amongst the oldest stands known within Cumberland Plain reserves.

### Aboriginal Heritage

- The Park sits within the traditional lands of the Darug Aboriginal People who continue to value their traditional association with their Country.
- Evidence of Aboriginal occupation is found in the Park, including an open camp site.

### Historic Heritage

- The Park has an historic connection with Glenfield Farm, which has arguably the most intact farm buildings from the Macquarie period surviving in NSW. Glenfield Farm is listed on the State Heritage Register along with a portion of the Park (referred to as Lot 2 for the purposes of this Plan) that provides the historic setting for the farm buildings. The farm grounds, including Lot 2, have high heritage significance as they have the capability to

demonstrate the core activities of the farm (Clive Lucas, Stapleton and Partners 2007) and the rural landscape.

## **Recreation and Tourism**

- The Park provides informal recreation opportunities in a growing urban area including 'on leash' dog walking.
- An ever-expanding network of regional cycling and walking trails link the Park with important recreational assets including Casula Powerhouse Arts Centre, the Georges River, council parks and other places of interest.

## **2. Management Context**

### **2.1 Legislative and policy framework**

The management of regional parks in NSW is in the context of a legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act) and Regulation, the *Threatened Species Conservation Act 1995* (TSC Act), the *Heritage Act 1977* and the policies of the National Parks and Wildlife Service (NPWS).

Other legislation, international agreements and strategies may also apply to management of the area. In particular, the *Environmental Planning and Assessment Act 1979* (EPA Act) may require assessment of environmental impact of works proposed in this plan. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) may apply in relation to actions that impact on matters of National Environmental Significance, such as migratory and threatened species listed under that Act.

A plan of management is a statutory document under the NPW Act. Once the Minister has adopted a plan, no operations may be undertaken within Leacock Regional Park except in accordance with this plan. This plan will also apply to any future additions to Leacock Regional Park. Should management strategies or works be proposed for Leacock Regional Park that are not consistent with this plan, an amendment to the plan or a new plan will be prepared and exhibited for public comment.

### **2.2 Management purposes and principles**

Regional parks are reserved under the NPW Act to protect and conserve areas in a natural or modified landscape that are suitable for public recreation and enjoyment.

Under the Act (section 30H), regional parks are managed to:

- provide opportunities for recreation and enjoyment in natural or modified landscapes;
- identify, interpret, manage and conserve the park so as to maintain and enhance significant landscape values;
- conserve natural and cultural values;
- promote public appreciation and understanding of the park's natural and cultural values;
- provide for sustainable visitor or tourist use and enjoyment that is compatible with conservation of natural and cultural values;
- provide for sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to conservation of natural and cultural values.

### **2.3 State Heritage Register**

Lot 2 (DP1126484) within Leacock Regional Park is listed on the State Heritage Register as part of item #00025 'Glenfield Farm' (1980) (refer to Section 3.4 Historic Heritage). Under the *Heritage Act 1977* all items listed on the State Heritage Register must be maintained in accordance with best-practice management principles, including maintenance to at least the minimum standards required under that Act.

According to the NPWS *Conservation Management Plan Policy – July 2002* (NPWS 2002a), all cultural heritage items listed on the State Heritage Register require a conservation management plan (CMP) to be prepared. Although two CMPs were prepared for Glenfield Farm in 2002 and 2009, the focus was on the farm buildings with little reference to the values of Lot 2. Works on Lot 2 may require approval from the relevant approval body under section 57 of the *Heritage Act 1977* unless a) it complies with the *Standard Exemptions for Works Requiring Heritage Council Approval* (Heritage Office 2006), b) it is exempted by a CMP endorsed by the Heritage Council, or c) it complies with a site specific exemption developed in consultation with the Heritage Branch (refer to Section 3.4 Historic Heritage).

### **2.4 Specific management directions**

In addition to the general principles for the management of regional parks (refer section 2.2), the following specific management directions apply to the management of Leacock Regional Park:

- Conserve threatened ecological communities, species and their habitat as well as old growth trees within the Park;
- Recognise and protect traditional and contemporary Aboriginal connections by providing opportunities for the traditional owners and the local Aboriginal community to help identify, protect, interpret and manage the Park's heritage values;
- Protect and enhance the Park's historic heritage values in particular the values associated with Glenfield Farm;
- Promote and facilitate the Park as a short stay destination and thoroughfare for regional cycle and walking routes through the 1.5 kilometre Blue Box Trail/Cycleway linking to regional attractors such as the Casula Powerhouse, Liverpool central business district, the Georges River and ultimately to Parramatta and Campbelltown; and
- Work with local government, other agencies and authorities, the community and commercial interests to maximise community interest and involvement.

### 3. Values

This plan aims to conserve natural, cultural and recreational values of Leacock Regional Park. The location, landforms and plant and animal communities of an area have determined how it has been used and valued by both Aboriginal and non-Aboriginal people. These values may be attached to the landscape as a whole or to individual components, for example to plant and animal species used by Aboriginal people.

#### 3.1 Geology, landscape and hydrology

The Park is located on the Cumberland Plain in the Sydney Basin. The majority of the Park comprises the Luddenham soil landscape of undulating to rolling hills on Wianamatta Group Ashfield Shale and Bringelly Shale formations. It includes the locally significant escarpment that runs from the north to the south of the Park allowing district views across to Holsworthy Military Reserve to the east and Sydney's skyline to the north east. This landscape is defined as erosional with slopes of 5-20%. The soil type is dependent on the topographic position, with crests of shallow dark podzolic soils or massive earthy clays, upper slopes of moderately deep red podzolic soils, and lower slopes and drainage lines of prairie and yellow podzolic soils. The fertility of the soil is low to moderate, the erosion hazard is high and the available water holding capacity of the soil decreases with depth due to impermeable highly plastic subsoil.

A narrow strip on the eastern side of the northern section of the Park is part of a quaternary alluvial terrace of sandstone and shale associated with the nearby Georges River and lies on the Richmond Soil Landscape. It is mostly flat with low relief. The surface soil is not dispersible and is not an erosion hazard except in dry or drought conditions.

The most south west section of the Park abutting Glen Regent Reserve lies on the Blacktown Soil Landscape which is gently undulating on Wianamatta Group-Ashfield Shale. The soils are described as 'shallow to moderately deep with hard setting mottled texture contrast soils. It is a poorly draining soil with relatively low fertility and no appreciable erosion. (Bannerman and Hazelton 1990).

The Main Southern Railway Line along the eastern boundary of the Park is elevated on a fill embankment.

The Park contains the headwaters of Glenfield Creek which flows underneath the Main Southern Railway Line and into the Georges River near Casula Railway Station. Situated on the creek is a large dam (shown as a water body on the Map of Leacock Regional Park).

Leacock Regional Park has been identified by the Sydney Metropolitan Catchment Management Authority (SMCMA) as an important natural asset. The *SMCMA Wetland GIS Prioritisation* identifies Leacock Regional Park as a high ranking medium priority wetland as part of the Sydney Metropolitan Catchment Action Plan.

#### Issues:

Reminiscent of past rural uses, the Park contains two dams, disrupting the natural flow of water to Glenfield Creek. Glenfield Creek has been realigned and dredged several times for sand mining in the 1960s and for other extractive uses on the site (Mayne-Wilson and Associates 2002). The creek has been prone to sedimentation due to urban development within its catchment area and erosion along the escarpment over the years when the site was extensively cleared of vegetation for farming purposes. During heavy rain events, periodic flooding occurs in the lower-lying areas of the Park as large volumes of stormwater from upstream urban areas enter Glenfield Creek. Furthermore, lack of stormwater management from Leacocks Lane along the western boundary of the Park encourages soil erosion and weed infiltration within the Park's bushland area north of All Saints Catholic Senior College.

Prior to reservation of the Park, building waste materials, including asbestos, were disposed of in the most north-west section of the Park in undetermined quantities. A preliminary asbestos assessment (Douglas Partners Pty Ltd 2003) identified the presence of asbestos fragments in bonded cement buried in land filling material. The potential for airborne asbestos fibres to be generated was found to be extremely low and the health risk to humans insignificant.

#### Desired Outcomes:

- Soil erosion is minimised;
- Stormwater runoff is managed to minimise soil erosion, weed infiltration, pollution and associated impacts on the Park's natural ecosystems;
- Catchment values, wetland values, water quality and health of Glenfield Creek are improved; and
- Any asbestos material identified is suitably controlled.

#### Management Response:

- 3.1.1 Design and undertake all works in a manner which minimises soil erosion;
- 3.1.2 Support the SMCMA and other relevant stakeholders in undertaking water quality monitoring within the Park;
- 3.1.3 Collaborate with SMCMA to undertake wetland improvements on park and restore the natural flow of Glenfield Creek if and where appropriate;
- 3.1.4 Collaborate with Liverpool City Council, All Saints Catholic Senior College and other relevant authorities as needed to protect and improve stormwater quality and minimise erosion upstream of the Park boundary through works such as installing appropriate stormwater control devices along Leacocks Lane and Glenfield Creek;
- 3.1.5 Monitor and appropriately treat areas of erosion with priority given to areas that directly affect Glenfield Creek or the Park's natural and cultural values; and
- 3.1.6 Investigate any suspected site contaminants in the Park and where identified, follow appropriate requirements and codes of practice in management, handling, removal and disposal.

### **3.2 Vegetation communities and native plants**

Leacock Regional Park is located within the Cumberland Sub-Region of the Sydney Basin Bioregion. The Park has been used for agricultural purposes, tree felling and sand mining since 1810 resulting in extensive clearing of native vegetation and an altered fire regime. Relics and re-growth of former forest and woodland exist in pockets across the Park.

The Park is located along a biodiversity corridor with a very high priority in the draft *Sydney Metropolitan Catchment Management Authority Biodiversity Corridor Prioritisation* (SMCMA 2011).

There are three vegetation communities within Leacock Regional Park - Shale Plains Woodland, Alluvial Woodland and Riparian Forest (NPWS 2002b).

Shale Plains Woodland exists in the north of the Park and in large patches to the west of Glenfield Creek on the slopes of the escarpment stretching to the south of the Park. Shale Plains Woodland is a sub-type of Cumberland Plain Woodland Critically Endangered Ecological Community, and is

listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act) (NSW Scientific Committee 2010a). It is also listed as critically endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This Critically Endangered Ecological Community is dominated by grey box (*Eucalyptus moluccana*) and forest red gum (*E. tereticornis*), with narrow-leaved ironbark (*E. crebra*), spotted gum (*Corymbia maculata*) and thin-leaved stringybark (*E. eugenioides*) occurring less abundantly. The shrub layer is dominated by blackthorn (*Bursaria spinosa*) whilst weeping meadow grass (*Microlaena stipoides* var *stipoides*) and kangaroo grass (*Themeda australis*) are found on the ground layer.

Alluvial Woodland and Riparian Forest are subtypes of River-Flat Eucalypt Forest on Coastal Floodplains listed as an EEC under the TSC Act 1995. Within the Park, this EEC is restricted to the alluvium of the Georges River and Glenfield Creek catchment and is dominated by forest red gum (*E. tereticornis*), cabbage gum (*E. amplifolia*), rough-barked apple (*Angophora floribunda*), broad-leaved apple (*A. subvelutina*), blue box (*E. baueriana*) and southern mahogany or bangalay (*E. botryoides*).

A more recent vegetation mapping project (DECCW 2009a,b) identifies an additional vegetation community in the southern section of the Park called Cumberland Swamp Oak Riparian Forest, which is a component of the Swamp Oak Floodplain Forest EEC listed under the NSW TSC Act. However some of the area within the Park may represent plantings rather than natural regeneration of this community.

The Park contains cleared grasslands created when the land was used for grazing. The grasslands are predominantly introduced grasses with occasional native grasses (Leary & Kwok 2007). The Park also contains a large stand of pre-European settlement old growth trees comprising *E. tereticornis* along Glenfield Creek. These trees are amongst the largest stand of trees greater than 80cm diameter within the reserve system of the Cumberland Plain (Leary & Kwok 2007).

An active volunteer bush regeneration group conducts bushland restoration works in the Weaving Gardens that is contiguous with the northern portion of the Park and is owned and managed by Liverpool City Council.

#### Issues:

The Cumberland Plain Woodland Critically Endangered Ecological Community is facing an extremely high risk of extinction in the immediate future. This is due to a loss of geographic distribution due to land clearing; a very large reduction in ecological function due to a change in community structure and species composition; a disruption of ecological processes including altered fire regimes; invasion and establishment of exotic species; and degradation and fragmentation of habitat (NSW Scientific Committee 2010a).

The plant communities of the Cumberland Plain are particularly vulnerable to weed invasion due to their grassy under storey, relatively fertile soils and past agricultural uses, displacing native plants and affecting regeneration of communities. Much of the understorey in all vegetation communities in the Park is dominated by introduced species including african olive (*Olea africana*), lantana (*Lantana camara*) and narrow-leaved privet (*Ligustrum sinense*). Most of the weed species have arrived as propagules via the river and creeks, or entered the park from neighbouring lands. Consequently, weed invasion is expanding primarily along boundaries and drainage lines, especially along Glenfield Creek and the stormwater drainage lines along the east-facing slopes.

Park activities that also damage native vegetation include vandalism, vegetation and soil disturbance from bicycles, walkers and dogs and suppression of the natural fire regime (UBM 1997). Furthermore, mowing limits native vegetation re-establishment and climate change may negatively impact ecosystem health in future years.

Leacock Regional Park is listed as a Priority Conservation Land (PCL) in the Cumberland Plain Recovery Plan (2010a) which was prepared under Commonwealth and State legislation to promote

the recovery of threatened species, populations and EECs on the Cumberland Plain. PCLs represent the best remaining opportunities in the region to secure long-term biodiversity benefits for the lowest possible cost through active management (DECCW 2010b).

The threatened ecological communities that exist within the Park are 'capable of some recovery, provided the soil has not been disturbed by earthworks, cultivation, fertilizer application or other means of nutrient or moisture enrichment' (NSW Scientific Committee 2010a). Good seed soil resilience exists in parts of the site that have undergone weed management in the past. However, many areas of the Park have been cultivated for many years to form pasture for grazing. Based on monitoring and evaluation of previous attempts to re-vegetate pasture in the Cumberland Plain natural assisted restoration will be challenging. Furthermore, remnants located along Glenfield Creek as well as down slope of sealed roads (Leacocks Lane and Casula Road) are exposed to high nutrient content and moisture, factors which have been suggested to exacerbate weed growth (NSW Scientific Committee 2010a). Given that former pasture areas will be 'extremely slow to recover characteristics of Cumberland Plain Woodland, if at all, the NSW Scientific Committee (2010a) suggest that 'experimentation with alternative restoration technologies is required' in such areas.

A significant vegetation restoration opportunity for Leacock Regional Park has arisen from the Southern Sydney Freight Line Project (SSFLP) built by the Australian Rail Track Corporation Ltd (ARTC). In 2011 the OEH and the Department of Planning agreed to ARTC's offset restoration proposal for enhancement planting at Leacock Regional Park. This was an alternative to offset plantings that were required under the original Condition 60(c)(ii) of the Southern Sydney Freight Line Project Approval for the clearing of EECs outside of the Park boundary. Enhancement works within the Park are to be conducted according to milestones outlined in the biodiversity restoration plan (in preparation). This plan will be informed by previous bushland plans of management prepared for Leacock Regional Park, will include strategic plans for weed management and bush regeneration, and may include experimentation with new methodologies to enhance the biodiversity of native vegetation as well as expand bushland into areas that are currently mowed such as along Leacocks Lane.

The extent of the weed problem in the reserve is such that weed control and bush regeneration will need to be an ongoing management priority. Biodiversity and weed management would also benefit from the formation of a community bush regeneration group to work over the long term.

No threatened plant species have been recorded in the Park to date, however it is possible that *Pimelea spicata* (spiked rice-flower) may occur as it has been recorded on an adjacent property (Leary & Kwok 2007). *Pimelea spicata*, a shrub listed as endangered under the TSC Act and EPBC Act has a strong association with Cumberland Plain Woodland. Other threatened plants may also be present. Strategies for the recovery of threatened species, populations and ecological communities are in the state-wide Threatened Species Priorities Action Statement (PAS), recovery plans and best practice guidelines. A recovery plan has been prepared for Cumberland Plain Woodland (DECCW 2010a) and for *Pimelea spicata* (DEC 2005a).

Refer to Section 4.1 for further discussion on weed-related issues and management responses.

#### Desired Outcomes:

- Negative impacts on threatened species and EECs are minimised;
- The habitat and populations of all threatened plant species and EECs are protected and maintained;
- Structural diversity and habitat values are restored in degraded areas; and
- Management of native vegetation, weeds and regeneration activities is conducted with consideration of the Park's historic and recreation values.



### Management Response:

- 3.2.1 Prepare and implement a biodiversity restoration plan for the Park in accordance with Condition 60(c)(ii) of the Southern Sydney Freight Line Project Approval;
- 3.2.2 Undertake ground surveys to map threatened plant species known or likely to be present in the Park and identify any threats;
- 3.2.3 Implement relevant actions and strategies in the PAS and recovery plans and best practice guidelines for threatened species and ecological communities present in the Park;
- 3.2.4 Facilitate research within the Park on the Cumberland Plain's threatened biodiversity as per Recovery Objective 4 of the Cumberland Plain Recovery Plan;
- 3.2.5 Work with neighbours, community groups (including Aboriginal communities) and students to undertake weed control and bush regeneration and to identify other opportunities for involvement in the recovery program and vegetation corridor enhancement;
- 3.2.6 Reduce mown areas through regeneration and planting of native species, with due consideration given to the need for fire buffers, public safety, access, open recreation areas and historic values;
- 3.2.7 Work collaboratively with local government and relevant land management organisations to encourage the creation of corridors/linkages with other remnant Cumberland Plain vegetation and improve the condition of these corridors, particularly along the creek line to the Georges River; and
- 3.2.8 Retain the introduced plantings near the lookout until they become senescent or die. Do not plant any flora species in the Park that are not endemic to the area.

### **3.3 Native animals**

The Park provides an important biodiversity link and wildlife movement corridor to adjoining areas including Glen Regent Reserve to the south and remnant vegetation along the Georges River to the east that links with the extensive bushland of Holsworthy Military Reserve. The two dams, particularly the one at the southern end of the Park, as well as the escarpment, provide important habitat for native fauna. Vegetation along Glenfield Creek and bushland in the northern section of the Park provide connectivity to the Georges River and suitable habitat for macropods such as the swamp wallaby (*Wallabia bicolor*). Little is known about aquatic fauna in Glenfield Creek and the dams.

To date six amphibians, seven reptiles, 70 native birds and 14 native mammals have been recorded within the Park (Leary & Kwok 2007). Vulnerable and endangered species found within the Park during the 2006 survey are listed in Table 1 below.

**Table 1: Vulnerable and endangered fauna species found in Leacock Regional Park 2007**

Species	TSC Act status	EPBC Act status
Greater Broad-nosed Bat ( <i>Scoteanax rueppellii</i> )	Vulnerable	
Eastern Free-tail Bat ( <i>Mormopterus norfolkensis</i> )	Vulnerable	
Large-footed Myotis ( <i>Myotis macropus</i> )	Vulnerable	
Grey-headed Flying Fox ( <i>Pteropus poliocephalus</i> )	Vulnerable	Vulnerable
Powerful Owl ( <i>Ninox strenua</i> )	Vulnerable	
Little Lorikeet ( <i>Glossopsitta pusila</i> )	Vulnerable	
Cumberland Plain Land Snail ( <i>Meridolum corneovirens</i> )	Endangered	

The endangered green and golden bell frog (*Litoria aurea*) was last recorded in the Park in 1963 but has not been seen since. It is also listed under the EPBC Act as vulnerable.

Strategies for the recovery of threatened species, populations and ecological communities have been set out in a state-wide PAS. Individual recovery plans and best practice guidelines may also be prepared for threatened species to consider management needs in more detail. Native fauna recovery plans relevant to Leacock Regional Park, include large forest owls (DEC 2006b), the green and golden bell frog (DEC 2005b), and grey-headed flying fox (DECCW 2009c). A best practice guideline has been prepared for the green and golden bell frog (DECC 2008a) as well as a management plan for the green and golden bell frog key population on the Georges River (DECC 2008b).

#### Issues:

Invasive weeds are encroaching on the habitat of threatened fauna species and altered fire regimes are negatively impacting upon habitat of endangered fauna.

Limited tree hollows exist within the Park due to previous clearing for forestry and agriculture over the last 200 years. 'Loss of hollow-bearing trees' is listed as a Key Threatening process under the TSC Act and is likely to impact on the populations of all of the threatened bird and bat species known from the Park.

Bell miner birds are encroaching on the habitat of local fauna species (see section 4.1) and visitors to the Park, especially those with unleashed dogs, can disturb native fauna and their habitat. Furthermore, native species populations are at threat from feral and domestic cats and dogs as well as foxes (see section 4.1).

Increased nutrients in waterways have an adverse affect on the aquatic fauna within Glenfield Creek. There is also a potential barrier to fish movement due to the causeway over Glenfield Creek which is part of the Blue Box Trail/Cycleway.

#### Desired Outcomes:

- The habitat and populations of native fauna species in the Park are identified and conserved;
- Negative impacts on threatened species are minimised; and
- Habitat values are restored in degraded areas.

#### Management Response:

- 3.3.1 Implement relevant actions and strategies in the PAS, recovery plans and best practice guidelines for threatened species present in the Park;
- 3.3.2 Periodically monitor fauna populations at the permanent sites established during the 2006 Vertebrate Fauna Survey, particularly after fires and pest management actions, targeting frogs, the Eastern Long-neck Turtle (*Chelodina longicollis*); birds particularly robins; and Bell Miner birds in surveys (Leary & Kwok 2007);
- 3.3.3 Encourage volunteer involvement in aquatic fauna surveys in Glenfield Creek and dams within the Park;
- 3.3.4 Consider impacts and implement appropriate management actions to minimise native fauna displacement when removing rubbish, slashing grass and undertaking weed management;
- 3.3.5 Liaise with the SMCMA and NSW Department of Primary Industries to better understand the habitat of aquatic fauna, fish passage and conservation requirements when undertaking works along Glenfield Creek and implement conservation requirements where possible;
- 3.3.6 Work collaboratively with Liverpool Council to promote responsible pet ownership through signage and education programs;
- 3.3.7 Protect and conserve old growth trees within the Park through addressing issues such as weeds, fire, hydrological changes, wood collection and other threats. Due consideration

must be given to trees that pose a public safety hazard within or adjacent to picnic or recreation facilities; and

- 3.3.8 Devise ways to augment or improve the availability of hollows in the Park which could include the installation of artificial nesting boxes for birds and bats.

### 3.4 Aboriginal heritage

The Park lies within the traditional country of the Darug people. The land, water, plants and animals within a landscape are central to Aboriginal spirituality and contribute to Aboriginal identity. Aboriginal communities associate natural resources with the use and enjoyment of foods and medicines, caring for the land, passing on cultural knowledge, kinship systems and strengthening social bonds. Aboriginal heritage and connection to nature are inseparable and need to be managed in an integrated manner across the landscape.

The Georges River was the natural boundary between the lands of the Tharawal<sup>1</sup> people in the east and south and the Darug people to the west and north. As such, the Park is located within an area which formed a point of contact between Aboriginal people. Today the Park is located within the area of the Tharawal Local Aboriginal Land Council. It is also an area of interest for the Cubbitch Barta Native Title Claimant Aboriginal Corporation.

The Park was the subject of an archaeological assessment in 1999 and an Aboriginal heritage management strategy was developed for the known and predicted archaeological resources in the Park. Only one open camp site was located on the ridge line to the south of the Lookout (Mary Dallas Consulting Archaeologists 1988, 1999). The open site was found to be largely disturbed by a number of previous land use impacts including construction of a dirt road and installation of underground telecommunications cables. On the basis of its disturbed and degraded context, the site was assessed as having little or no further research potential. The site is now covered in thick vegetation, significantly reducing surface exposure of artefacts.

The study concluded that *'Aboriginal site types most likely to occur in the present study area are open artefact scatters, isolated finds and scarred trees. Greatest archaeological potential for Aboriginal sites within the study area occurs on well-drained level or low gradient ground adjacent to the main drainage lines and on undisturbed areas of the main ridge line.'* (Mary Dallas Consulting Archaeologists 1999).

The Aboriginal heritage of the Park has *'considerable Aboriginal value and educational potential'* (Mary Dallas Consulting Archaeologists 1999). Evidence exists of peaceful relations between Dr Charles Throsby, the original owner of Glenfield Farm, and traditional owners, demonstrating a valuable social connection with early European settlers and explorers. In the 1950s Glenfield Farm housed the first Aboriginal heritage museum in Sydney, operated by the then owner Mr Jim Leacock (Mary Dallas Consulting Archaeologists 1999).

While NPWS has legal responsibility for the protection of Aboriginal sites and places under the NPW Act, it 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.

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<sup>1</sup> Also known as Tharawal / Dariwal (AIATSIS Language and Peoples Thesaurus). Other spellings: Turuwal (Ridley 1875, 1878); Thurrawal (Mathews and Everitt 1900, Mathews 1901a, 1901b, 1903, Capell 1970); Thur'rawal (Mathews 1902); Dharawal (Capell 1970, Eades 1976).

### Issues:

The Aboriginal archaeological, historic and spiritual values of the Park are not fully known and sites may have been destroyed by past land uses.

### Desired Outcomes:

- Aboriginal sites and places are identified, recorded and protected;
- Aboriginal people are involved in management and interpretation of the Park's Aboriginal cultural values;
- Understanding of the Park's cultural values is improved;
- Impacts on Aboriginal heritage values are minimised; and
- There are increased employment opportunities for Aboriginal people in park management.

### Management Response:

- 3.4.1 Continue to consult and involve Darug descendant groups, Tharawal people, the Cubbitch Barta Native Title Claimant Aboriginal Corporation and other interested Aboriginal community organisations and custodial families in the management of the Park, including the management of Aboriginal sites and places and natural values;
- 3.4.2 Encourage further research into the Aboriginal heritage values of the Park with the involvement of Darug descendant groups, Tharawal people, the Cubbitch Barta Native Title Claimant Aboriginal Corporation and other interested Aboriginal community organisations and people;
- 3.4.3 Involve Aboriginal people in development of material and programs for interpretation of Aboriginal culture and heritage;
- 3.4.4 Aboriginal heritage sites found within the Park should be investigated and recorded on OEH's Aboriginal Heritage Information Management System (AHIMS) database;
- 3.4.5 Engage, involve and employ Aboriginal people in park management operations where opportunities exist; and
- 3.4.6 Undertake an archaeological survey and cultural assessment (in consultation with the local Aboriginal community) prior to all works with the potential to impact on known Aboriginal sites or values.

## **3.5 Historic heritage**

Heritage places and landscapes are made up of living stories as well as connections to the past. Heritage places and landscapes can include natural resources, objects, customs and traditions that individuals and communities have inherited from the past and wish to conserve for current and future generations. Cultural heritage comprises places and items that may have historic, scientific, aesthetic and social significance. NPWS is responsible for conserving significant heritage features found within the parks and reserves it manages.

Leacock Regional Park has an historic connection with Glenfield Farm, arguably the most intact representation of rural farm complexes from the Macquarie period that survives in New South Wales (Clive Lucas, Stapleton and Partners 2007). The farm buildings are listed on the State Heritage Register along with a portion of the Park referred to as 'Lot 2' that provides the historic setting for the buildings. Cumulatively, the grounds of the farm that include Lot 2 have high heritage significance as they have the capability to demonstrate the core activities of the farm (Clive Lucas, Stapleton and Partners 2007). Furthermore, view corridors extending through Lot 2

between the Glenfield Farm buildings and the Main Southern Railway Line are also recognised as historically significant and need to be considered in the management of Lot 2.

Along with the Glenfield Farm Group, Lot 2 is identified as a heritage item in the *Liverpool City Council Local Environmental Plan 2008* and is included in the Glenfield Farm listing on the Register of the National Trust of Australia (NSW).

Glenfield Farm was established by Dr Charles Throsby in 1810 and was part of a large estate of more than 1,200 acres that included a mile of frontage onto the Georges River. Dr Throsby served the fledgling colony as a surgeon, magistrate, explorer and member of the Legislative Council, and became a successful early grazier and one of the largest landholders in New South Wales in the early 19th century (Clive Lucas, Stapleton and Partners 2007). From 1859 Glenfield Farm was leased as a working dairy farm. During one lease, from 1891-1896, the farm was used by the government as an auxiliary to the Liverpool Asylum to relieve overcrowding. More than 80 asylum inmates at a time lived in tents on the farm. Glenfield Farm continued to operate as a farm during this time and the inmates were used as labour (Clive Lucas, Stapleton and Partners 2007).

Glenfield Farm also has strong associations with James Leacock, an innovative dairy farmer and entrepreneur. He purchased Glenfield Farm in 1920 where he pioneered organic farming and established a goodwill community co-operative in the latter half of the 20th century (Clive Lucas, Stapleton and Partners 2009). During his ownership, Leacock established the first Aboriginal heritage museum in Sydney in the 1950s known as the Austro-Asian Cultural Centre (Clive Lucas, Stapleton and Partners 2009; Mary Dallas Consulting Archaeologists 1999).

Glenfield operated as a farm until around 2003 when the remaining portion of Glenfield Farm was purchased by the NSW Department of Planning. In 2007, the last subdivision of Glenfield Farm occurred to create two allotments. Lot 1 DP 1126484, a 1.17 hectare parcel containing the Glenfield farm buildings, was transferred to the Historic Houses Trust of NSW to restore the buildings. Lot 2, comprising a 4.3 hectare parcel, was transferred to NPWS as an extension to Leacock Regional Park. Following restoration, Lot 1 was put on the market to be sold as a private residence in 2011. It is subject to a Heritage Agreement under the NSW *Heritage Act 1977* that includes provision for at least two open days per year.

Historic structures remaining on Lot 2 include an earth dam, a well dating from the convict era, roadways and old fence posts and fence lines that indicate original grazing paddock boundaries.

There is also a house called Mt Omei that dates back to the 1930s. It is situated on the southern boundary of All Saints Catholic Senior College and comprises a collection of buildings that include a homestead, stable, staff quarters and outbuildings. Mt Omei has some significant local heritage links to the development and settlement of the Casula area. It is listed as a potential heritage item on the NPWS Historic Heritage Information Management System (HHIMS) as its heritage significance is yet to be determined.

#### Issues:

To date, the historic heritage values of the Park are not well understood. Although two conservation management plans have been prepared for Glenfield Farm (Mayne Wilson and Associates 2002; Clive Lucas, Stapleton and Partners 2009), they focus on the farm building structures and immediate surrounds.

Lot 2 is on the State Heritage Register as it was part of the same block of land as the Glenfield Farm buildings when it was listed in 1980. This block of land was then subdivided into two lots, one of which was integrated into the Park. As the rest of the Park may have the same historic heritage values as Lot 2 as it also formed part of the original farm, an assessment by a heritage consultant will need to be prepared to determine which parts of the Park should be subject to a Conservation Management Plan (CMP). A CMP is required in accordance with the NPWS *Conservation Management Plan Policy – July 2002* for items listed on the State Heritage Register.

In preparing the CMP, consideration should be given to:

- previous CMPs for Glenfield Farm including the *Glenfield Farm Planning and Heritage Report* (CPC Consulting 2001) as well as advice from the Heritage Branch (McDougall 2008) and NPWS policy (2002a);
- identifying and recording historic heritage including rural uses, structures, view corridors, exotic plants and historical archaeological resources to inform conservation and planning procedures, access and interpretation (McDougall 2008);
- assessing the significance of the historic heritage;
- forming a clear vision statement and strategies to protect and enhance the Park's heritage values including retaining views from Glenfield Farm complex to the east, retaining views from the Main Southern Railway Line to the farm complex and ways to restore Lot 2 to open grassed woodland to retain the rural open landscape (McDougall 2008; Clive Lucas, Stapleton and Partners 2007);
- identifying how park management activities, such as weed and fire control programs and recreation facilities avoid adversely impacting upon the cultural heritage items or features within the Park;
- identifying opportunities for public education and interpretation; and
- implementing an integrated or whole of landscape approach with regard to the identification and assessment of all cultural (both historic and pre-contact Aboriginal) and natural values of the Park.

Aggressive growth of woody weeds, in particular African olive, lantana and small-leaved privet, is currently threatening the cultural landscape values and historic view corridors of the Park. (Refer to Section 4.1 Pests, Weeds). In particular, the views from the escarpment to the east are progressively becoming obscured as the previously agricultural landscape of Lot 2 is being invaded. The weeds also inhibit access to the site for survey and assessment of its historic heritage values, however in places where weed control has recently been undertaken, there is the opportunity to undertake archaeological research before there is any regrowth.

#### Desired Outcomes:

- The cultural heritage values of the Park are identified, protected and interpreted;
- A CMP is prepared for the whole Park or just for Lot 2, to be advised by a heritage assessment; and
- Mt Omei is assessed for its heritage significance.

#### Management Response:

- 3.5.1 Protect and manage cultural heritage features and values according to their significance;
- 3.5.2 Manage Lot 2 consistent with the Heritage Act 1977 requirements for sites listed on the State Heritage Register and seek appropriate approvals from the Heritage Branch for any works that could impact on heritage values;
- 3.5.3 Prepare a CMP for the whole Park or just for Lot 2, (to be advised by a heritage assessment), to identify values of significance and guide future use, management, approval processes and interpretation;
- 3.5.4 Investigate the opportunity to undertake archaeological research in areas that have been recently cleared of woody weeds.

- 3.5.5 Prior to archaeological surveys being undertaken, consider future weed management so as to mitigate any unexpected maintenance liabilities i.e. clearing for archaeological investigations may accelerate weed regrowth and cause unexpected maintenance;
- 3.5.6 All historic heritage items found within the Park should be investigated and recorded on the OEH Historic Heritage Information Management System (HHIMS) register;
- 3.5.7 Consult with the Heritage Branch of the OEH, the Historic Houses Trust, the National Trust, Liverpool City Council, Aboriginal people (see 3.4.3) and the owners of Glenfield Farm regarding the installation of signage and other interpretation relating to the Park's heritage values and collaborate with them during open days at Glenfield Farm; and
- 3.5.8 Conduct a heritage assessment of the Mt Omei residence and associated buildings. If found to be of significance, a Heritage Action Statement will be prepared to guide future management and works (refer to section 5.1).

### **3.6 Recreation and Education**

NPWS parks and reserves provide a range of recreation opportunities. NPWS aims to ensure that visitors enjoy, experience and appreciate the parks while park values are conserved and protected.

Leacock Regional Park is part of a network of recreational open space that services the growing demand for informal recreation areas in western Sydney (DECC 2008c). The Liverpool area comprises a high diversity of cultural backgrounds as well as an aging population, together with a recent baby boom. The Liverpool Local Government Area (LGA) is projected to experience the largest population increase across all New South Wales LGAs in the period 2001 to 2031 with around 150,000 additional residents, largely driven by immigration (DECC 2008c). Children aged between 0-11 years and young people aged 12-24 years currently make up close to 40% of Liverpool's total population. As the population grows, Liverpool will continue to be a young city with many new families moving into the area (Liverpool City Council 2010). As for all of New South Wales, by 2031 a significantly greater proportion of the population living within 30 minutes travel time of the Park will be in the 65 and over age group (35 per cent increase from 2006). Over this time, it is expected that there will be increased demand for informal recreation in western Sydney's public open space areas corresponding to the population increase and current trend to participate more in casual recreation activities (Liverpool City Council 2010).

Leacock Regional Park is designed for short stay visitation centred around activities such as bush walking, bird watching, cycling and on-leash dog walking in a natural hinterland setting. Visitor facilities comprise a lookout in the south of the Park near Leacock's Lane which provides panoramic views from the ridgeline eastwards over the Holsworthy bushland and towards Sydney's skyline, a cycleway which is also used for walking, jogging, rollerblading and scooters, a 1.6 kilometre Bellbird Walking Track, and a small day use area at the start of the Bellbird Walking Track adjacent to Leacocks Lane in the north of the Park. There is no public vehicle access or car park within the Park, however there is sufficient parking along Leacocks Lane.

Recent funding provided by the NSW Roads and Traffic Authority (RTA) has facilitated the completion of the sealed cycleway/multi purpose trail within the Park called the Blue Box Trail/Cycleway. This facility provides access for a range of visitors who traverse the Park for recreation and exercise. It is also used by commuters wishing to connect with Casula and Glenfield Railway Stations which lie to the north and south of the Park respectively. The Blue Box Trail /Cycleway links to the adjoining Weaving Gardens and Casula Powerhouse Arts Centre to the north and Glen Regent Reserve Playing Fields to the south. It also connects to a multitude of regional bike routes that are largely on road that can circulate through the Park for a portion of the journey.

Leacock Regional Park is well connected to a Sydney-wide strategic cycleway and trail system that is gradually being expanded over time through federal, state and local government funding programs. Ultimately, this network known as the Metro Sydney Bike Network and Regional Recreational Trails Framework will enable people to travel across the region and into other regions for recreation and active transport (DIPNR 2005a). Already the Park is well placed strategically and can be visited when cycling between Liverpool City and Campbelltown. Furthermore it is only about 2km on road from the southern entry to the Park to the start of the 40km M7 cycleway and links to other cycleways. There will be potential for further increases to visitation following the construction of the South West Rail link from Edmondson Park to Glenfield Station and Liverpool City Council initiatives to turn the Georges River Corridor into a recreation, cultural and heritage precinct (DIPNR 2005b; Heather Nesbitt Planning 2003).

The Park provides a loop track for walking via the Bellbird walking track in the north of the Park that connects with the cycleway in the east. Walkers can then head south to join with another walking track at the escarpment lookout. The pedestrian footpath along Leacocks Lane completes the loop at the top of the Bellbird walking track. The track is approximately 3 kilometres of an easy to moderate grade.

Leacock Regional Park is also part of the proposed Great Kai'mia Way walking trail along the nearby Georges River. Although not yet complete, the Great Kai'mia Way vision is to have over two hundred kilometres of sustainable walking tracks and cycleways which link Botany Bay, the Woronora valley, large parts of southern and western Sydney and the Illawarra Escarpment.

The Park is located within walking distance of a number of schools and has a direct bus route from Leacocks Lane to Liverpool City Centre that places it in a position to be utilised for educational purposes. Although it is already utilised by local schools, there is potential to increase its usage as an educational resource for environmental and physical education.

Glenfield house and farm buildings is opened at least two days per annum in accordance with a heritage agreement made under the *Heritage Act 1977*. Opportunities exist for appreciation of the Park's rural landscape during these events.

Potential also exists for community engagement to assist with conservation activities on Park through Liverpool Council's local volunteer environment groups, sustainability programs developed by the Powerhouse Museum and initiatives by Glenfield Waste Disposal Facility.

#### Issues:

Glenfield Waste Disposal Facility on the eastern side of the Main Southern Railway Line and the flyover associated with the Southern Sydney Freight Line can be seen from the lookout on the escarpment. These facilities detract from the scenic views from the lookout. The waste facility is unlikely to be closed within the life of the plan, however when the facility is closed and rehabilitated, it is proposed to be included into the Park (Clouston 1996).

From time to time vandalism and arson occurs within the Park detracting from visitor enjoyment, increasing risk of damage to property outside of the Park boundary due to fire and necessitating cost shifting from park enhancement to expenditure on repairs. Little signage exists within the Park and BBQ facilities and seating have had to be removed due to acts of vandalism (refer to Section 4.3). Motor bikes also enter the Park, detracting from the visitor experience, creating noise, erosion and disturbing vegetation.

As the Park is an attractive destination for dog walkers, dog waste can be seen left around the Park which adds to the discomfort of other visitors. Dog waste changes the behaviour of terrestrial fauna and increases nutrient content in the soil and water, encouraging weeds and reducing water quality respectively.



Rubbish dumping also occurs around the periphery of the Park, particularly along Leacocks Lane between Glenfield Farm and All Saints Catholic Senior College and off Casula Road heading down to Casula Railway Station. Dumping matter typically consists of building waste, wood chips and garden refuse.

The older sealed section of the Blue Box Trail/Cycleway does not conform with the NSW Transport, Roads and Maritime Services regional cycleway standards in terms of line marking, width and signage.

Informal walking tracks are commonly created by users of the Park. Generally the tracks are created due to a need to create short cuts for walkers and motor bike riders between destinations. Most of these tracks are located in the vicinity of the Mt Omei residence, along the boundary of the school, the northern section of the Blue Box Trail and between the Blue Box Trail and the railway corridor on the north east of the Park. These informal tracks can lead to erosion and changes in hydrological conditions, causing an adverse impact on the native vegetation.

#### Desired Outcomes:

- Leacock Regional Park provides a safe and enjoyable experience for park visitors;
- Visitor facilities are considered within the context of other open space and recreation opportunities in the area and continue to provide for short stay activities such as picnics, cycling, walking and on-leash dog walking;
- Appreciation and awareness of the Park's natural and cultural values and the need for their conservation is enhanced through education and interpretation;
- Negative impacts of visitors on the Park's values are minimised; and
- The park is a useful educational resource for local schools, community organisations and the wider community.

#### Management Response:

- 3.6.1 Manage the Park as a day use area only;
- 3.6.2 Continue to permit on leash dog walking within the Park and restrict the activity to designated areas including grassy picnic areas, tracks and trails;
- 3.6.3 Promote the Park through a range of media and special events as a destination and thoroughfare for regional cycling and walking as well as for recreation, education, conservation and community engagement. Collaborate with the Casula Powerhouse Arts Centre, All Saints Catholic Senior College, Liverpool City Council, and other stakeholders;
- 3.6.4 Control access off the tracks and trails shown on the map to protect natural and cultural values, through measures including fencing off areas, Ranger patrols and installing signage to prohibit use of the area;
- 3.6.5 Maintain the picnic area at the start of the Bellbird Walking Track and the seating at the lookout;
- 3.6.6 Update information regarding Leacock Regional Park on the NPWS website to include linkages to the existing and planned regional cycleway and walking trail network as well as its historic connections to Glenfield Farm;
- 3.6.7 Prepare and install Park signage including entry, directional, access, interpretive and educational signs regarding designated areas for on leash dog walking, dog waste disposal and rubbish dumping. Directional signage along the Blue Box Trail/Cycleway should be prepared in consultation with the RTA and Liverpool City Council to indicate that the trail/cycleway is part of a regional network of cycle and walking trails;

- 3.6.8 Work with Liverpool Council to investigate the provision of dog waste disposal facilities adjacent to the Park boundary;
- 3.6.9 Investigate the need for picnic and BBQ facilities along the urban interface along Leacocks Lane and the need for low key seating along the Blue Box Trail/Cycleway. Develop a prioritised implementation strategy if required;
- 3.6.10 Remove old and damaged park infrastructure/furniture that may cause harm to park visitors. Replacement of damaged infrastructure/furniture will be determined by level of use; and
- 3.6.11 Review connectivity of all tracks and trails (including informal) on Park and develop a prioritised program for the hardening or closing of tracks and trails based on their connectivity, importance and impacts on natural and cultural values.

## 4. Issues

### 4.1 Pests

Pest species are organisms that have negative health, environmental, economic and social impacts and are most commonly introduced species. Pests can have impacts across the range of park values, including impacts on biodiversity, cultural heritage, catchment and scenic values.

The Draft Metropolitan South West Regional Pest Management Strategy Part B (OEH 2011) prioritises specific pest management programs in alignment with State and local priorities, legislation and the NSW Invasive Species Plan. Pest management priorities for Leacock Regional Park will be directed by this strategy that will be updated annually as new information and priorities emerge. Whilst the strategy is being finalised, the *Sydney Region Pest Management Strategy* (DECCW 2008) will inform weed and pest animal management in the Park.

### Weeds

Weed density mapping has been completed for the Park (Epacris 2008). Twenty seven weed species were identified in the *Sydney Region Pest Management Strategy* (DECCW 2008) as occurring in the Park (see Table 2 below).

**Table 2: Weeds recorded in Leacock Regional Park**

Common name	Scientific name	Comment
African Olive	<i>Olea europaea</i> ssp.	Established widespread infestation throughout Park
Lantana* <sup>#</sup>	<i>Lantana camara</i>	Established widespread infestation throughout Park
African Boxthorn*	<i>Lycium ferocissimum</i>	Scattered infestation throughout the Park
Blackberry* <sup>#</sup>	<i>Rubus fruticosus</i> aggregate	Scattered infestation throughout the Park
Black Locust	<i>Robinia pseudoacacia</i>	Scattered infestation throughout the Park
Green Cestrum <sup>#</sup>	<i>Cestrum parqui</i>	Scattered infestation throughout the Park
Privet (large leaved)	<i>Ligustrum lucidum</i>	Scattered infestation throughout the Park
Privet (small leaved)	<i>Ligustrum sinense</i>	Scattered infestation throughout the Park
Honey Locust	<i>Gleditsia triacanthos</i>	Isolated infestation restricted to a small geographic area
Tree of Heaven	<i>Ailanthus altissima</i>	Isolated infestation restricted to a small geographic area
Mother of Millions	<i>Bryophyllum delagoense</i>	Significant weed likely to impact on biodiversity
Paterson's Curse	<i>Echium plantagineum</i>	Significant weed likely to impact on biodiversity
St John's Wort	<i>Hypericum perforatum</i>	Significant weed likely to impact on biodiversity

### Exotic Perennial Grasses

African Lovegrass	<i>Eragrostis curvula</i>	Scattered infestation throughout the Park
Couch	<i>Cynodon dactylon</i>	Scattered infestation throughout the Park
Ehrharta	<i>Ehrharta erecta</i>	Scattered infestation throughout the Park
Kikuyu	<i>Pennisetum clandestinum</i>	Scattered infestation throughout the Park
Rhodes Grass	<i>Chloris gayana</i>	Scattered infestation throughout the Park
Pampas Grass <sup>#</sup>	<i>Cortaderia</i> spp.	Isolated infestation restricted to a small geographic area

## Exotic Vines and Scramblers

Balloon Vine	<i>Cardiospermum grandiflorum</i>	Scattered infestation throughout the Park
Bridal Creeper**	<i>Asparagus asparagoides</i>	Scattered infestation throughout the Park
Cats Claw Creeper*	<i>Macfadyena unguis-cati</i>	Scattered infestation throughout the Park
Honeysuckle (Japanese)	<i>Lonicera japonica</i>	Scattered infestation throughout the Park
Moth Vine	<i>Araujia sericifera</i>	Scattered infestation throughout the Park
Morning Glory	<i>Ipomea indica</i>	Scattered infestation throughout the Park
Trad	<i>Tradescantia fluminensis</i>	Scattered infestation throughout the Park
Madeira Vine*	<i>Anredera cordifolia</i>	Isolated infestation restricted to a small geographic area

\* Declared Weed of National Significance

# Declared 'noxious' under the *Noxious Weed Act 1993*

The Park is particularly susceptible to weed infestation due to previous agricultural uses on the land and soil disturbance from sand mining and infrastructure works. Garden escapes from adjoining residential areas, stormwater from the adjacent urban area and its location along Glenfield Creek with fertile alluvial soils also encourage weeds.

African olive is the most problematic weed in the Park. 'Invasion of native plant communities by African olive' was listed as a Key Threatening Process (KTP) under the TSC Act in October 2010 (NSW Scientific Committee 2010b). African olive is progressively invading the remnant bushland understorey in the Park as well as the former pasture lands, including in Lot 2 which is listed on the State Heritage Register for its association with Glenfield Farm. The PAS and Recovery Plan for Cumberland Plain Woodland includes the need for development and implementation of a coordinated program for African olive removal across all land tenures. The cross-tenure *African Olive Management Plan for the Sydney Region* (2008-2013) is also applicable to Leacock Regional Park (Sydney Weeds Committees 2008).

Blackberry is a Weed of National Significance that has been found in the Park. Blackberry is a target species in the cross-tenure *Sydney-wide Vines and Scramblers Management Plan 2010-2015* (Sydney Weeds Committees 2010a).

Lantana is another Weed of National Significance that exists within the Park and 'Invasion establishment and spread of lantana' is listed as a KTP under the TSC Act. The control of impacts and prevention of expansion or establishment of lantana in River-flat Eucalypt Forest on Coastal Floodplains EEC within Leacock Regional Park is a high priority, particularly in areas of critical conservation significance and in areas with high resilience. Lantana is a target species in the cross-tenure *Sydney Tree and Shrub Weed Management Plan 2010-2015* (Sydney Weeds Committees 2010b). The *Lantana Best Practice Manual and Decision Support Tool* (Australian, Qld & NSW governments 2009) will be applied in the Park.

'Invasion of native plant communities by exotic perennial grasses' has been listed as a KTP under the TSC Act and is an identified threat to Cumberland Plain Woodland. 'Invasion and establishment of exotic vines and scramblers' has also been listed as a KTP under the TSC Act. Species particularly impacted by vines and scramblers include the threatened Cumberland Plain land snail as well as threatened owl, bird and bat species through loss of hollows. Bridal creeper, moth vine and balloon vine are target species in the cross-tenure *Sydney-wide Vines and Scramblers Management Plan 2010-2015* (Sydney Weeds Committees 2010a).

Weed management is also necessary to protect the cultural viewscape to and from the historic house of Glenfield Farm (DECCW 2008)

A state-wide assessment of biodiversity priorities for the management of widespread weeds has been completed on a catchment by catchment basis (DPI & OEH 2011) and the riparian corridor of Glenfield Creek and the north and north-eastern areas of the Park have been identified as a high priority control site (site number 2279). The priorities established by the widespread weeds project are one of the sources used by the Metro South West Region Draft Pest Management Strategy to define priorities for pest management in Leacock Regional Park.

In 2007 funding was obtained from the SMCMA to improve the condition and connectivity of a “green web” of native vegetation corridors. The funding supported a joint project in the northern portion of Leacock Regional Park and Weaving Gardens. The project included weed removal, planting of locally sourced native species, bush regeneration and ongoing maintenance while the plantings established themselves. The program has been successful in suppressing weeds and presents evidence of site resilience highlighting the ability to increase native vegetation corridors within the Park. Although the natural structure of the Cumberland Plain Woodland has not yet been achieved, the plantings now provide valuable habitat for many animals including the endangered Cumberland Plain Land Snail.

The Australian Rail Track Corporation is funding preparation of a biodiversity restoration plan to identify existing natural values and the best way to restore the vegetation communities within the Park. This document will be guided by the Metro South West Regional Pest Management Strategy.

## **Pest Animals**

Due to the close proximity of the Park to urban areas, there are a number of domestic and feral animals present in the Park and surrounding areas. These species include predators such as the cat (*Felis catus*), domesticated dog (*Canis familiaris*), fox (*Vulpes vulpes*) and potentially mosquito fish (*Gambusia holbrooki*). Predators such as these have the ability to severely affect populations of native animals within the Park. Domestic dogs are currently permitted in the Park but must be leashed and under control at all times.

Foxes, dogs and cats suppress native animal populations, particularly medium sized ground-dwelling and semi-arboreal mammals, ground-nesting birds and freshwater turtles. Foxes have also been implicated in the spread of a number of weed species such as blackberry (*Rubus fruticosus*). ‘Predation by the European red fox’ was declared a KTP in 1998 under the TSC Act.

Leary T & Kwok A (2007) found that there are no particularly sensitive species as defined by the *Fox Threat Abatement Plan* (DECCW 2010c) to fox predation known from the reserve. Although there was some evidence of fox activity at the time of the fauna survey, it was considered low. Given the Park’s close proximity to houses, it was determined that there is virtually no potential for fox baiting, however other approved techniques for fox control could be applied including cage trapping and den fumigation, should fox numbers need to be controlled.

Other introduced species in the Park include the rabbit (*Oryctolagus cuniculus*), the Indian myna (*Acridotheres tristis*) and a range of other introduced bird species. These species are able to affect native species via competition for food, shelter and other resources. At the time of survey, Leary T & Kwok A (2007) concluded that although rabbits occur within the Park, they are at low densities and have little biological impact on indigenous biodiversity. It was advised that ‘if any future hazard reduction burns or wildfires occur, rabbit numbers and regeneration should be monitored post-fire to ensure adequate regeneration of seedlings in the endangered ecological communities’ (Leary & Kwok 2007). If rabbit numbers increase, approved control techniques could be used in accordance with the Metropolitan South West Regional Pest Management Strategy.

Over-abundant populations of native bell miners (*Manoria melanophrys*) are associated with a form of eucalypt dieback. ‘Forest eucalypt dieback associated with over-abundant psyllids and bell miners’ has been listed as a KTP under the TSC Act. Bell Miner Associated Dieback (BMAD) is currently spreading rapidly through sclerophyll forests in New South Wales and may be occurring in the Park, particularly along Glenfield Creek. The presence of bell miners drives away

insectivorous birds that would otherwise help to control insect numbers (Bell Miner Associated Dieback Working Group 2004). In 2006, Leary & Kwok (2007) found the number of bell miners in the Park to be high and recommended on-going monitoring of their numbers and their impacts on vegetation. Few of the eucalypt species within the Park are identified as highly susceptible to DMAD dieback, however the susceptibility of many species is unknown.

BMAD generally results in a depleted canopy and mid-storey and a native understorey replaced by dense shrubby vegetation, often dominated by lantana or vine thickets. In the case of Leacock Regional Park, the dominant understorey species is African olive. The woody weed invasion that has occurred within the Park may have exacerbated the situation by creating a habitat well suited to the bell miner.

#### Desired Outcomes:

- Negative impacts of pest and weed species on the Park's natural and cultural values are minimised;
- Users and neighbours of the Park practise responsible pet ownership;
- Pest plants and animals are controlled and where possible eliminated; and
- Dieback caused by bell miners is prevented and if necessary controlled.

#### Management Response:

- 4.1.1 Manage pest species in accordance with the Metropolitan South West Regional Pest Management Strategy;
- 4.1.2 Monitor the Park to determine the presence and extent of weed and pest species and update the Regional Pest Management Strategy accordingly through the AMS system to reflect new information. In the monitoring process also identify biodiversity or other values at risk;

#### *Weeds*

- 4.1.3 In the process of invasive weed removal and regeneration, endeavour to retain the view to and from the heritage structures of Glenfield Farm House and associated buildings and retain the open grassed woodland to form a rural open landscape on Lot 2 (McDougall 2008; Clive Lucas, Stapleton & Partners 2007);
- 4.1.4 Establish volunteer bush regeneration programs within the Park to address weed impacts on native bushland and historic heritage and actively seek partnership with relevant authorities when appropriate;

#### *Pest animals*

- 4.1.5 After hazard reduction burns or wildfires, monitor rabbit numbers and introduce appropriate control methods if needed to ensure adequate regeneration of seedlings in the endangered ecological communities and prevent excessive grazing and negative impacts upon the populations of Cumberland land snail;
- 4.1.6 Undertake an assessment of the extent and significance of dieback due to bell miner birds, particularly impacts to the old growth trees along Glenfield Creek and support research into appropriate indicators to monitor the effects of BMAD in the Park; and
- 4.1.7 Implement recommendations in the *Bell Miner Associated Dieback Strategy* and undertake weed management programs to reduce bell miner habitat. This may include trapping programs within the Park if deemed appropriate from bell miner monitoring.

## 4.2 Fire

The primary fire management objectives of NPWS are to protect life and property and community assets from the adverse impacts of fire, whilst managing fire regimes to maintain and protect biodiversity and cultural heritage.

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 TSC Act.

Prior to reservation, the fire history in what is now the Park is not well documented. Since reservation of the Park in 1997, there have been a number of hazard reduction burns as well as small wildfires which may have been the result of arson. The hazard reduction burn program within the Park has been focussed on areas to the north, east and south of All Saints College, with the aim of protecting assets both within and adjacent to the Park. Most areas of native vegetation in the Park are within the prescribed fire thresholds, with the exception of an isolated area of Alluvial Woodland adjacent to the railway line, where fire thresholds have been exceeded.

Park assets that are vulnerable to fire damage include the two houses that are currently leased for residential purposes, historic timber fence posts, Leacock's Lookout, day use facilities at the western end of the Bellbird Walking Track and the bridge on the Blue Box Trail/Cycleway. Natural assets vulnerable to fire include old growth trees along Glenfield Creek, habitat for threatened flora and fauna species, in particular the Cumberland Plain land snail, and hollow bearing trees.

Vulnerable assets adjacent to the Park are All Saints Catholic Senior College, historic Glenfield Farm and residential dwellings along Leacocks Lane and Casula Road. The Main Southern Railway Line, extending along the eastern boundary of the Park is also vulnerable to fire.

A separate fire management strategy, which defines the fire management approach for the Park, was prepared in 2006 (DEC 2006a). 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.

The Fire Management Strategy will be reviewed in accordance with the OEH Fire Management Manual to ensure accuracy of information (e.g. fire history). Other changes to the Fire Management Strategy (e.g. rezoning) may be required after significant fire events or in response to receipt of new information or other developments.

In accordance with the Fire Management Strategy an annual program of bushfire management and hazard reduction works will be identified and undertaken in Leacock Regional Park. These works may include fire trail maintenance and mechanical hazard reduction or prescribed burns to reduce fuel hazards in Asset Protection Zones (APZ) and Strategic Fire Advantage Zones (SFAZ).

The Blue Box Trail/Cycleway can accommodate small fire trucks up to a Category 7. To ensure these limitations are clearly understood, appropriate signage needs to be installed at strategic locations within the Park consistent with the *Fire Trail Policy* (Bush Fire Coordinating Committee 2007) and *Park Signage Manual* (DECCW 2010d).

NPWS maintains cooperative arrangements with surrounding landowners and other fire authorities such as the Rural Fire Service (RFS) and Fire and Rescue NSW, and is actively involved with the Macarthur Bush Fire Management Committee (BFMC). Cooperative arrangements include fire planning, fuel management and information sharing. Hazard reduction programs, ecological burning proposals and fire trail works are submitted annually to the Macarthur BFMC.

### Desired Outcomes:

- Impacts of fire on life, property and the environment are minimised;
- The potential for spread of bushfires on, from, or into the Park is minimised;
- Fire regimes are appropriate for conservation of native plant and animal communities; and
- Historic heritage values are protected from fire.

### Management Response:

- 4.2.1 Implement the *Leacock Regional Park Fire Management Strategy* including maintaining overall fuel hazard in designated APZs and SFAZs so they do not exceed the levels prescribed by the NPWS Fire Management Manual (OEH 2011);
- 4.2.2 Review the Fire Management Strategy and revise fire history, fire management zones and other information as required (in accordance with the Fire Management Manual (DECCW 2010e);
- 4.2.3 Develop and implement an annual program of hazard reduction works;
- 4.2.4 Continue to be involved in the Macarthur Bush Fire Management Committee and maintain cooperative arrangements with Fire and Rescue NSW and local Rural Fire Service brigades and surrounding landowners in regard to fuel management and fire suppression;
- 4.2.5 Install appropriate signs on the Blue Box Trail/Cycleway consistent with the *Fire Trail Policy* (Bush Fire Coordinating Committee 2007) and *Park Signage Manual*;
- 4.2.6 Monitor the ability of flora to recover between fires and review regimes where relevant;
- 4.2.7 Rehabilitate areas disturbed by fire suppression operations, including temporary track and controls lines, as soon as practical after the fire;
- 4.2.8 Liaise with the Liverpool Local Area Command and the Macarthur BFMC in relation to arson prevention and response; and
- 4.2.9 When arson occurs, respond immediately to minimise damage to Park assets and neighbouring life and property.

## **4.3 Vandalism**

From time to time vandalism of visitor facilities occurs within the Park, detracting from visitor enjoyment. Picnic and BBQ facilities have had to be removed along Leacock's Lane and below the lookout near Glenfield Creek and resources have needed to be used on repairs instead of Park enhancement. Furthermore, motorbikes are illegally used within the Park from time to time and besides creating an unpleasant noise, they create a danger for park visitors particularly on the Blue Box Trail/Cycleway, damage vegetation and cause wheel ruts that lead to soil erosion.

The position and shape of the Park limits passive surveillance as it is linear, located below Leacock's Lane and abuts a railway line and a waste facility.

Rubbish dumping also occurs from time to time around the periphery of the park, particularly along Leacocks Lane between Glenfield Farm and All Saints Catholic Senior College on a flat mowed area with easy access off Leacocks Lane. Dumping matter typically consists of building waste, wood chips and garden refuse. This area will soon be fenced off, restricting any unlawful dumping activities at this location.



#### Desired Outcomes:

- Reduce the occurrence of vandalism and rubbish dumping within the Park; and
- Increase the feeling of safety and security for visitors to the Park.

#### Management Response:

- 4.3.1 Liaise with the Liverpool Local Area Commander to assist and conduct night time patrols to help mitigate ongoing anti-social behaviour and further vandalism;
- 4.3.2 Participate in Neighbourhood Watch programs and other approaches to minimise vandalism and anti-social behaviour organised by local authorities;
- 4.3.3 Install information signage where appropriate to inform visitors of permitted activities within the Park;
- 4.3.4 Install appropriate motorbike barriers at major entry points to the Park and on the Blue Box Trail/Cycleway;
- 4.3.5 When necessary, install temporary surveillance cameras to establish patterns and regularity of use;
- 4.3.6 Consider the need to install fences to discourage rubbish dumping and educate neighbours on the effects of illegal dumping; and
- 4.3.7 Maintain a presence in the Park during peak visitation periods by way of Ranger patrols.

#### **4.4 Climate Change**

Anthropogenic climate change has been listed as a key threatening process under the TSC Act and EPBC Act. Projections of future changes in climate for New South Wales include higher temperatures, a rise in sea levels and water temperatures, more intense but possibly reduced annual average rainfall, increased temperature extremes and higher evaporative demand. These changes are likely to lead to greater intensity and frequency of fires, more severe droughts, reduced river runoff and water availability, regional flooding and increased erosion.

Climate change may significantly affect biodiversity by changing population size and distribution of species, modifying species composition and altering the geographical extent of habitats and ecosystems. The potential impact of climate change is difficult to assess since it depends on the compounding effects of other pressures, particularly barriers to migration and pressure from introduced animals. Species most at risk are those unable to migrate or adapt, particularly those with small population sizes or with slow growth rates.

To the year 2050, Sydney region's expected climate change and associated impacts (DECCW 2010f) include a hotter climate, more frequent and intense bushfires and more rain in spring and summer. Sydney falls within an area of New South Wales projected to be 1–3°C hotter by 2050. The expected increases in temperature, evaporation and high fire risk days are likely to influence bushfire frequency and intensity across Sydney. The bushfire season is likely to be extended as a result of warmer temperatures and fire frequency is likely to increase. Although within an area of New South Wales where summer and spring rainfall are projected to rise by 10 to 20 per cent, Sydney's autumn rainfall is expected to be unchanged and winter rainfall is expected to decline by 20 to 5 per cent by 2050. These changes would affect the amount of water reaching rivers and creeks with the greatest change projected to be in summer. Major increases in runoff are likely to impact on the stormwater system and where capacity is reached, cause flooding.

OEH, including NPWS, has made a commitment to environmental sustainability under the *DECCW Sustainability Action Plan 2010* (DECCW 2010g). Activities include reducing greenhouse gas emissions from NPWS operations through measures such as improving energy efficiency of park facilities. 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 Outcomes:

- The effects of climate change on natural systems are reduced.

Management Response:

- 4.4.1 Continue existing fire, pest, and weed management and bushland restoration programs to increase the Park's ability to cope with future disturbance, including climate change, and encourage research into appropriate indicators to monitor the effects of climate change;
- 4.4.2 Work with other land managers, particularly Liverpool City Council and the community to improve cross-boundary efforts in creating buffers and corridors and managing threats within the Park and adjoining areas; and
- 4.4.3 Align Park management with relevant climate change strategies.

## 5. Management Operations and Other Uses

### 5.1 Management facilities and operations

#### Park Management Trails

The Park contains one management trail that partly includes the Blue Box Trail/Cycleway. The management trail provides access for fire management and park visitors from the north to the south of the Park (see Map 1). Authorised management vehicles access this track via locked gates at Weaving Gardens, or the unsealed road in the southern section of the Park off Leacocks Lane. Public vehicular access on this trail is prohibited.

#### Buildings

The Park contains two houses off Leacocks Lane, each with a right of way. The Mt Omei residence and associated buildings located to the south of All Saints Catholic Senior College date back to the 1930s and are privately tenanted for residential purposes. The buildings are in poor condition with medium level site access, medium standard utilities, medium vandalism and public safety risk, very high cost of repairs, very high ongoing costs and no operational need with low to moderate revenue potential.

Lot 21 DP 552488 on Leacocks Lane to the north of Glenfield Farm is also currently leased for residential purposes and is in good condition. The house has medium standard of utilities, low vandalism and public safety risk, no historic value, minimal cost of repairs and ongoing costs, no operational need and low to medium revenue potential.

The tenants of the residential buildings were given residential tenancy agreements by the NSW Department of Planning that have continued since the land was transferred to the NPWS.

An assessment needs to be conducted on the possible future management strategies for Mt Omei and Lot 21. Any management strategy for Mt Omei will need to be informed by an assessment of significance (Refer Section 3.5). If no significance is established, options could include demolition and reintegration into the Park. Similarly, an option for Lot 21 could also include demolition and reintegration into the Park. In the meantime, tenancing the buildings for residential purposes can continue.

#### Desired Outcomes:

- The principles of ecologically sustainable development guide management operations; and
- The houses on Park are managed consistent with legislative and park management requirements.

#### Management Response:

- 5.1.1 Prepare an assessment on future management options for Mt Omei and Lot 21 DP 552488 Leacocks Lane including consideration of demolition and revegetation of the sites if the houses are not required for management purposes and if Mt Omei has no heritage significance as per 5.5.1; and
- 5.1.2 Maintain existing tenancy agreements in accordance with the *Residential Tenancies Act 2010* until the tenants leave or subject to the recommendations of the assessment of future management options.

## 5.2 Non-NPWS uses/operations

A number of state and regional authorities currently occupy or use land reserved as Leacock Regional Park for public utilities or access to public utilities. These include telecommunications operators, Sydney Water and Railcorp.

There are a number of legal instruments including agreements and easements which cover the facilities managed by other authorities within the Park. These instruments aim to minimise impacts on the Park's core values. Sydney Water infrastructure within the Park is managed in accordance with the state-wide *Access Agreement for Routine Operation, Maintenance and Inspection of Sydney Water in Parks and Reserves*. A right of carriageway easement has been made for Railcorp to access the railway corridor along the eastern boundary of the Park. Furthermore, an easement for the Liverpool-Minto 33kV Transmission Line extends along the eastern boundary of the Park, however it has not been used to date.

The long term aim is to reduce the number of utility or non-park uses within the Park and issue licences to formalise services and access requirements not already covered by a licence or easement. Due to the narrow configuration and small size of the Park, any further utility developments in the Park are considered inappropriate.

### Adjoining Land

Weaving Gardens, currently managed by Liverpool City Council, adjoins the Park directly to the north. Visitors to the Park traverse through Weaving Gardens in order to enter or leave the Park from the north, via the Blue Box Trail/Cycleway. There is no visible boundary between Weaving Gardens and the Park.

The management of weeds, fire, visitor access and rubbish within Weaving Gardens has direct implications on Leacock Regional Park and cooperative management is required between Liverpool City Council and the OEH to ensure the best outcomes for the Park and Weaving Gardens.

To ensure continuity with future conservation programs and to assist with visitor management, discussions could be initiated with Liverpool City Council regarding the future management of Weaving Gardens, including potential for its addition to Leacock Regional Park.

Discussions could also be initiated with Liverpool City Council regarding a small section of land at the southern end of the Park that is divided from the rest of Leacock Regional Park by Glenfield Creek. This land is more integrated with Glen Regent Reserve in terms of visitor access and options for it to be managed by Liverpool City Council could be explored. This could include a memorandum of understanding whereby Council is given the responsibility to manage the isolated land subject to Council enhancing recreation opportunities in Glen Regent Reserve.

The northern boundary of the Park is boarded by private properties. Encroachment and unauthorised vehicle access are issues that need to be regulated.

### Desired outcomes:

- Weaving Gardens, Leacock Regional Park and Glen Regent Reserve are managed in a cohesive way to ensure consistency in conservation, fire management and visitor experience; and
- Service utility uses and activities are maintained in accordance with agreement/consent conditions and are managed to minimise impacts on core park values and Park infrastructure.

Management response:

*Adjoining Land*

- 5.2.1 Initiate discussions with Liverpool City Council whereby Council is assigned management responsibility for the isolated southern portion of land within the Park, subject to Council enhancing recreation opportunities at Glen Regent Reserve;
- 5.2.2 Initiate discussions with Liverpool City Council regarding the future management of Weaving Gardens, including potential addition to Leacock Regional Park;
- 5.2.3 Survey Park boundaries where encroachments may be occurring and remove any encroachments;
- 5.2.4 Maintain a close relationship with Liverpool City Council for all issues or opportunities that could impact or enhance Weaving Gardens, Glen Regent Reserve and Leacock Regional Park; and
- 5.2.5 Vehicle access across the Park will not be permitted to gain access to adjoining private properties.

*Easements*

- 5.2.6 Liaise with utility service providers in relation to easements, maintenance needs and access within the Park to ensure compliance with legislation, NPWS policy and agreements.

## 6. Implementation

This plan of management establishes a scheme of operations for Leacock Regional Park. Implementation of this plan will be undertaken within the annual programs of the NPWS Metropolitan South West Region and relevant OEH sections.

Identified activities for implementation are listed in Table 3. Relative priorities are allocated against each activity as follows:

- **High** priority activities are those imperative to achievement of 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 those that are necessary to achieve the objectives and desired outcomes but are not urgent.
- **Low** priority activities are desirable to achieve management objectives and desired outcomes but can wait until resources become available.
- **Ongoing** is for activities that are undertaken on an annual basis or statements of management intent that will direct the management response if an issue that arises.

This plan of management does not have a specific term and will stay in force until amended or replaced in accordance with the NPW Act.

**Table 3: List of Management Response**

Action No.	Management response	Priority*
<b>6.1 On-Park Ecological Conservation – Plan ref. 3.1, 3.3, 4.4</b>		
<b>3.1.1</b>	Design and undertake all works in a manner which minimises soil erosion;	<b>O</b>
<b>3.1.2</b>	Support the SMCMA and other relevant stakeholders in undertaking water quality monitoring within the Park;	<b>L</b>
<b>3.1.3</b>	Collaborate with SMCMA to undertake wetland improvements on park and restore the natural flow of Glenfield Creek if and where appropriate;	<b>M</b>
<b>3.1.4</b>	Collaborate with Liverpool City Council, All Saints Catholic Senior College and other relevant authorities as needed to protect and improve stormwater quality and minimise erosion upstream of the Park boundary through works such as installing appropriate stormwater control devices along Leacocks Lane and Glenfield Creek;	<b>M</b>
<b>3.1.5</b>	Monitor and appropriately treat areas of erosion with priority given to areas that directly affect Glenfield Creek or the Park's natural and cultural values;	<b>M</b>
<b>3.1.6</b>	Investigate any suspected site contaminants in the Park and where identified, follow appropriate requirements and codes of practice in management, handling, removal and disposal;	<b>L</b>
<b>3.2.1</b>	Prepare and implement a biodiversity restoration plan for the Park in accordance with Condition 60(c)(ii) of the Southern Sydney Freight Line Project Approval;	<b>H</b>

<b>3.2.7</b>	Work collaboratively with local government and relevant land management organisations to encourage the creation of corridors/linkages with other remnant Cumberland Plain vegetation and improve the condition of these corridors, particularly along the creek line to the Georges River;	<b>O</b>
<b>3.3.2</b>	Periodically monitor fauna populations at the permanent sites established during the 2006 Vertebrate Fauna Survey, particularly after fires and pest management actions, targeting frogs, the Eastern Long-neck Turtle ( <i>Chelodina longicollis</i> ); birds particularly robins; and Bell Miner birds in surveys (Leary & Kwok 2007);	<b>M</b>
<b>3.3.5</b>	Liaise with the SMCMA and NSW Department of Primary Industries to better understand the habitat of aquatic fauna, fish passage and conservation requirements when undertaking works along Glenfield Creek and implement conservation requirements where possible;	<b>L</b>
<b>3.3.7</b>	Protect and conserve old growth trees within the Park through addressing issues such as weeds, fire, hydrological changes, wood collection and other threats. Due consideration must be given to trees that pose a public safety hazard within or adjacent to picnic or recreation facilities;	<b>O</b>
<b>3.3.8</b>	Devise ways to augment or improve the availability of hollows in the Park which could include the installation of artificial nesting boxes for birds and bats.	<b>L</b>
<b>4.4.1</b>	Continue existing fire, pest, and weed management and bushland restoration programs to increase the Park's ability to cope with future disturbance, including climate change, and encourage research into appropriate indicators to monitor the effects of climate change;	<b>O</b>
<b>4.4.2</b>	Work with other land managers, particularly Liverpool City Council and the community to improve cross-boundary efforts in creating buffers and corridors and managing threats within the Park and adjoining areas;	<b>M</b>
<b>4.4.3</b>	Align Park management with relevant climate change strategies;	<b>O</b>
<b>6.2 Threatened Species – Plan ref. 3.2, 3.3</b>		
<b>3.2.2</b>	Undertake ground surveys to map threatened plant species known or likely to be present in the Park and identify any threats;	<b>L</b>
<b>3.2.3</b> <b>3.3.1</b>	Implement relevant actions and strategies in the PAS and recovery plans and best practice guidelines for threatened species and ecological communities present in the Park;	<b>O</b>
<b>3.2.4</b>	Facilitate research within the Park on the Cumberland Plain's threatened biodiversity as per Recovery Objective 4 of the Cumberland Plain Recovery Plan;	<b>M</b>
<b>6.3 Aboriginal Cultural Heritage – Plan ref. 3.4</b>		
<b>3.4.1</b>	Continue to consult and involve Darug descendant groups, Tharawal people, the Cubbitch Barta Native Title Claimant Aboriginal Corporation and other interested Aboriginal community organisations and custodial families in the management of the Park, including the management of Aboriginal sites and places and natural values;	<b>O</b>

<b>3.4.2</b>	Encourage further research into the Aboriginal heritage values of the Park with the involvement of Darug descendant groups, Tharawal people, the Cubbitch Barta Native Title Claimant Aboriginal Corporation and other interested Aboriginal community organisations and people;	<b>O</b>
<b>3.4.3</b>	Involve the Aboriginal people in development of material and programs for interpretation of Aboriginal culture and heritage;	<b>O</b>
<b>3.4.4</b>	Aboriginal heritage sites found within the Park should be investigated and recorded on OEH's Aboriginal Heritage Information Management System (AHIMS) database;	<b>H</b>
<b>3.4.5</b>	Engage, involve and employ Aboriginal people in park management operations where opportunities exist;	<b>H</b>
<b>3.4.6</b>	Undertake an archaeological survey and cultural assessment (in consultation with the local Aboriginal community) prior to all works with the potential to impact on known Aboriginal sites or values;	<b>H</b>
<b>6.4 Historic Heritage – Plan ref. 3.5</b>		
<b>3.5.1</b>	Protect and manage cultural heritage features and values according to their significance;	<b>O</b>
<b>3.5.2</b>	Manage Lot 2 consistent with the Heritage Act 1977 requirements for sites listed on the State Heritage Register and seek appropriate approvals from the Heritage Branch for any works that could impact on heritage values;	<b>O</b>
<b>3.5.3</b>	Prepare a CMP for the whole Park or just for Lot 2, (to be advised by a heritage assessment), to identify values of significance and guide future use, management, approval processes and interpretation;	<b>L</b>
<b>3.5.4</b>	Investigate the opportunity to undertake archaeological research in areas that have been recently cleared of woody weeds;	<b>L</b>
<b>3.5.5</b>	Prior to archaeological surveys being undertaken, consider future weed management so as to mitigate any unexpected maintenance liabilities i.e. clearing for archaeological investigations may accelerate weed regrowth and cause unexpected maintenance;	<b>H</b>
<b>3.5.6</b>	All historic heritage items found within the Park should be investigated and recorded on the OEH Historic Heritage Information Management System (HHIMS) register;	<b>M</b>
<b>3.5.7</b>	Consult with the Heritage Branch of the OEH, the Historic Houses Trust, the National Trust, Liverpool City Council, Aboriginal people (see 3.4.3) and the owners of Glenfield Farm regarding the installation of signage and other interpretation relating to the Park's heritage values and collaborate with them during open days at Glenfield Farm;	<b>M</b>
<b>3.5.8</b>	Conduct a heritage assessment of the Mt Omei residence and associated buildings. If found to be of significance, a Heritage Action Statement will be prepared to guide future management and works (Refer to section 5.1);	<b>M</b>



<b>6.5 Visitor Services – Plan ref. 3.6</b>		
<b>3.6.1</b>	Manage the Park as a day use area only;	<b>O</b>
<b>3.6.2</b>	Continue to permit on leash dog walking within the Park and restrict the activity to designated areas including grassy picnic areas, tracks and trails;	<b>O</b>
<b>6.6 Visitor Infrastructure – Plan ref. 3.6</b>		
<b>3.6.4</b>	Control access off the tracks and trails shown on the map to protect natural and cultural values, through measures including fencing off areas, Ranger patrols and installing signage to prohibit use of the area;	<b>O</b>
<b>3.6.5</b>	Maintain the picnic area at the start of the Bellbird Walking Track and the seating at the lookout;	<b>O</b>
<b>3.6.7</b>	Prepare and install Park signage including entry, directional, access, interpretive and educational signs regarding designated areas for on leash dog walking, dog waste and rubbish dumping. Directional signage along the Blue Box Trail/Cycleway should be prepared in consultation with the RTA and Liverpool City Council to indicate that the cycleway is part of a regional network of cycle and walking trails;	<b>H</b>
<b>3.6.8</b>	Work with Liverpool Council to investigate the provision of dog waste disposal facilities adjacent to the Park boundary;	<b>L</b>
<b>3.6.9</b>	Investigate the need for picnic and BBQ facilities along the urban interface along Leacocks Lane and the need for low key seating along the Blue Box Trail/Cycleway. Develop a prioritised implementation strategy if required;	<b>L</b>
<b>3.6.10</b>	Remove old and damaged park infrastructure/furniture that may cause harm to park visitors. Replacement of damaged infrastructure/furniture will be determined by level of use;	<b>O</b>
<b>3.6.11</b>	Review connectivity of tracks and trails (including informal) on Park and develop a prioritised program for the hardening or closing of tracks and trails based on their connectivity, importance and impacts on natural and cultural values;	<b>M</b>
<b>6.7 Community Programs And Education – Plan ref. 3.2, 3.3, 3.6, 4.3</b>		
<b>3.2.5</b>	Work with neighbours, community groups (including Aboriginal communities) and students to undertake weed control and bush regeneration and to identify other opportunities for involvement in the recovery program and vegetation corridor enhancement;	<b>H</b>
<b>3.3.3</b>	Encourage volunteer involvement in aquatic fauna surveys in Glenfield Creek and dams within the Park;	<b>L</b>
<b>3.3.6</b>	Work collaboratively with Liverpool Council to promote responsible pet ownership through signage and education programs;	<b>M</b>
<b>3.6.3</b>	Promote the Park through a range of media and special events as a destination and thoroughfare for regional cycling and walking as well as for recreation, education, conservation and community engagement.	<b>M</b>

	Collaborate with the Casula Powerhouse Arts Centre, All Saints Catholic Senior College, Liverpool City Council, and other stakeholders;	
<b>3.6.6</b>	Update information regarding Leacock Regional Park on the NPWS website to include linkages to the existing and planned regional cycleway and walking trail network as well as its historic connections to Glenfield Farm;	<b>H</b>
<b>4.3.1</b>	Liaise with the Liverpool Local Area Commander to assist and conduct night time patrols to help mitigate ongoing anti-social behaviour and further vandalism;	<b>M</b>
<b>4.3.2</b>	Participate in Neighbourhood Watch programs and other approaches to minimise vandalism and anti-social behaviour organised by local authorities;	<b>L</b>
<b>4.3.3</b>	Install information signage where appropriate to inform visitors of permitted activities within the Park;	<b>H</b>
<b>4.3.4</b>	Install appropriate motorbike barriers at major entry points to the Park and on the Blue Box Trail/Cycleway;	<b>M</b>
<b>4.3.5</b>	When appropriate, install temporary surveillance cameras to establish patterns and regularity of use;	<b>O</b>
<b>4.3.6</b>	Consider the need to install fences to discourage rubbish dumping and educate neighbours on the effects of illegal dumping;	<b>M</b>
<b>4.3.7</b>	Maintain a presence in the Park during peak visitation periods by way of Ranger patrols;	<b>H</b>
<b>6.8 Weeds – Plan ref. 4.1</b>		
<b>4.1.1</b>	Manage weed species in accordance with the Regional Pest Management Strategy;	<b>H</b>
<b>4.1.2</b>	Monitor the Park to determine the presence and extent of weed species and update the Regional Pest Management Strategy accordingly through the AMS system to reflect new information. In the monitoring process also identify biodiversity or other values at risk;	<b>M</b>
<b>4.1.3</b>	In the process of invasive weed removal and regeneration, endeavour to retain the view to and from the heritage structures of Glenfield Farm House and associated buildings and retain the open grassed woodland to form a rural open landscape on Lot 2 (McDougall 2008; Clive Lucas, Stapleton & Partners 2007);	<b>M</b>
<b>4.1.4</b>	Establish volunteer bush regeneration programs within the Park to address weed impacts on native bushland and historic heritage and actively seek partnership with relevant authorities when appropriate;	<b>H</b>
<b>6.9 Pest Animals – Plan ref. 4.1</b>		
<b>4.1.1</b>	Manage pest species in accordance with the Regional Pest Management Strategy;	<b>H</b>
<b>4.1.5</b>	After hazard reduction burns or wildfires, monitor rabbit numbers and introduce appropriate control methods if needed to ensure adequate regeneration of seedlings in the endangered ecological communities and	<b>L</b>

	prevent excessive grazing and negative impacts upon the populations of Cumberland land snail;	
<b>4.1.6</b>	Undertake an assessment of the extent and significance of dieback due to bell miner birds, particularly impacts to the old growth trees along Glenfield Creek and support research into appropriate indicators to monitor the effects of BMAD in the Park;	<b>M</b>
<b>4.1.7</b>	Implement recommendations in the <i>Bell Miner Associated Dieback Strategy</i> and undertake weed management programs to reduce bell miner habitat. This may include trapping programs within the Park if deemed appropriate from bell miner monitoring;	<b>M</b>
<b>6.10 Fire Management – Plan ref. 4.2</b>		
<b>4.2.1</b>	Implement the <i>Leacock Regional Park Fire Management Strategy</i> including maintaining overall fuel hazard in designated APZs and SFAZs so they do not exceed the levels prescribed by the NPWS Fire Management Manual (OEH 2011);	<b>H</b>
<b>4.2.2</b>	Review the Fire Management Strategy and revise fire history, fire management zones and other information as required (in accordance with the Fire Management Manual (DECCW 2010e);	<b>H</b>
<b>4.2.3</b>	Develop and implement an annual program of hazard reduction works;	<b>H</b>
<b>4.2.4</b>	Continue to be involved in the Macarthur Bush Fire Management Committee and maintain cooperative arrangements with Fire and Rescue NSW and local Rural Fire Service brigades and surrounding landowners in regard to fuel management and fire suppression;	<b>H</b>
<b>4.2.5</b>	Install appropriate signs on the Blue Box Trail/Cycleway consistent with the <i>Fire Trail Policy</i> (Bush Fire Coordinating Committee 2007) and <i>Park Signage Manual</i> ;	<b>H</b>
<b>4.2.6</b>	Monitor the ability of flora to recover between fires and review regimes where relevant;	<b>M</b>
<b>4.2.7</b>	Rehabilitate areas disturbed by fire suppression operations, including temporary track and control lines, as soon as practical after the fire;	<b>H</b>
<b>4.2.8</b>	Liaise with the Liverpool Local Area Command and the Macarthur BFMFC in relation to arson prevention and response;	<b>H</b>
<b>4.2.9</b>	When arson occurs, respond immediately to minimise damage to Park assets and neighbouring life and property;	<b>H</b>
<b>6.11 General Infrastructure And Maintenance – Plan ref. 3.6, 5.1</b>		
<b>3.2.6</b>	Reduce mown areas through regeneration and planting of native species, with due consideration given to the need for fire buffers, public safety, access, open recreation areas and historic values;	<b>H</b>
<b>3.2.8</b>	Retain the introduced plantings near the lookout until they become senescent or die. Do not plant any flora species in the Park that are not endemic to the area.	<b>L</b>

3.3.4	Consider impacts and implement appropriate management actions to minimise native fauna displacement when removing rubbish, slashing grass and undertaking weed management;	O
5.1.1	Prepare an assessment on future management options for Mt Omei and Lot 21 DP 552488 Leacocks Lane including consideration of demolition and revegetation of the sites if the houses are not required for management purposes and if Mt Omei has no heritage significance;	L
5.1.2	Maintain existing tenancy agreements in accordance with the <i>Residential Tenancies Act 2010</i> until the tenants leave or subject to the recommendations of the assessment of future management options as per 5.5.1;	O
<b>6.12 Assessments, Acquisition And Establishment – Plan ref. 5.2</b>		
5.2.1	Initiate discussions with Liverpool City Council whereby Council is assigned management responsibility for the isolated southern portion of land within the Park, subject to Council enhancing recreation opportunities at Glen Regent Reserve;	L
5.2.2	Initiate discussions with Liverpool City Council regarding the future management of Weaving Gardens, including potential addition to Leacock Regional Park;	L
5.2.3	Survey Park boundaries where encroachments may be occurring and remove any encroachments;	L
5.2.4	Maintain a close relationship with Liverpool City Council for all issues or opportunities that could impact or enhance Weaving Gardens, Glen Regent Reserve and Leacock Regional Park;	O
5.2.5	Vehicle access across the Park will not be permitted to gain access to adjoining private properties;	O
5.2.6	Liaise with utility service providers in relation to easements, maintenance needs and access within the Park to ensure compliance with legislation, NPWS policy and agreements.	O

## Acronyms

AHIMS	Aboriginal Heritage Information Management System
APZ	Asset Protection Zone
ARTC	Australian Rail Track Corporation Ltd
BEWP	Biodiversity Enhancement Works Program
BFMC	Bush Fire Management Committee
BMAD	Bell Miner Associated Dieback
CMP	Conservation Management Plan
DEC	Department of Environment and Conservation (NSW)
DECC	Department of Environment and Climate Change (NSW)
DECCW	Department of Environment, Climate Change and Water (NSW)
DIPNR	Department of Infrastructure, Planning and Natural Resources (NSW)
DOP	Department of Planning (NSW)
DPI	Department of Primary Industries (NSW)
DUAP	Department of Urban Affairs and Planning (NSW)
EEC	Endangered Ecological Community
EPA Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)
HHIMS	Historic Heritage Information Management System
KTP	Key Threatening Process
MOU	Memorandum of Understanding
NPW Act	<i>National Parks and Wildlife Act 1974</i> (NSW)
NPWS	National Parks and Wildlife Service (NSW)
NSW	New South Wales
OEH	Office of Environment and Heritage (NSW)
PAS	Priority Action Statement
PCL	Priority Conservation Land
RFS	Rural Fire Service
RTA	Roads and Traffic Authority
SFAZ	Strategic Fire Advantage Zone
SMCMA	Sydney Metropolitan Catchment Management Authority
SSFLP	Southern Sydney Freight Line Project
TSC Act	<i>Threatened Species Conservation Act 1995</i> (NSW)
UBM	Urban Bushland Management Consultants

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