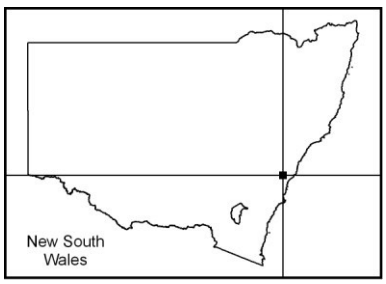
Office of Environment & Heritage
NSW National Parks & Wildlife Service

Draft Plan of Management

William Howe Regional Park



Acknowledgements

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

The NPWS acknowledges that William Howe Regional Park is in the traditional country of the D'harawal people.

FRONT COVER: William Howe Regional Park
Photo: Isabelle Connolly OEH

For additional information or any inquiries about this Park or this plan of management, contact the NPWS Nattai 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) NSW 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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William Howe Regional Park
Draft Plan of Management

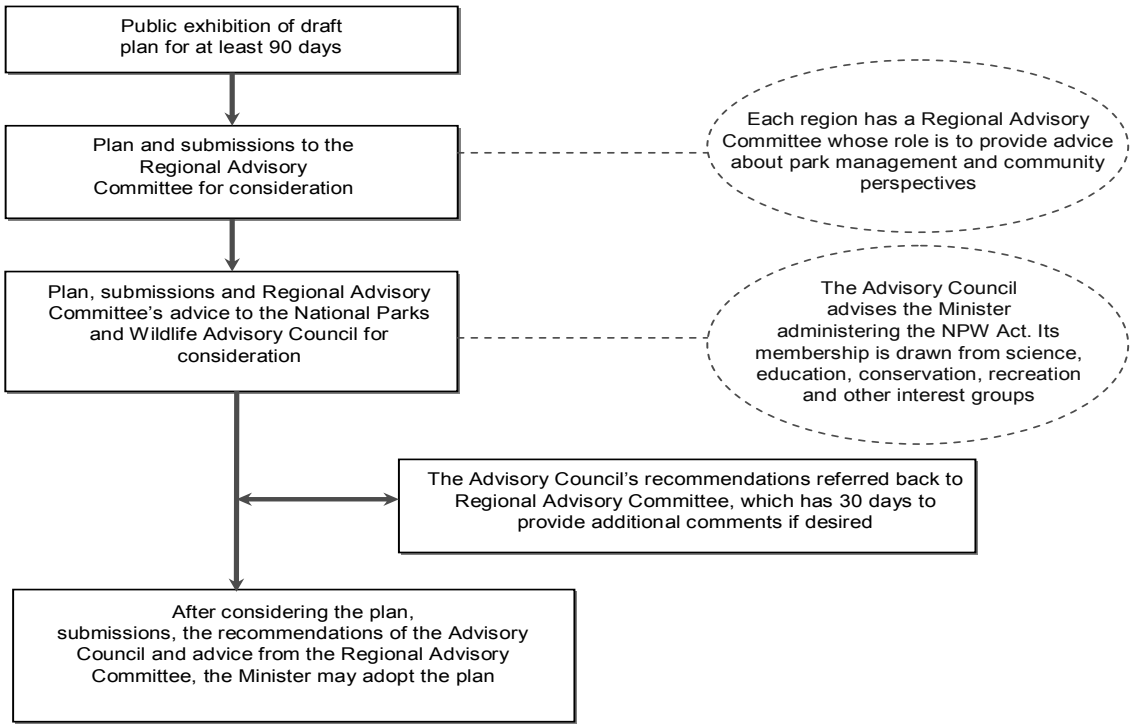
NSW National Parks and Wildlife Service

May, 2013

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, 19th August 2013.**

Submissions can be made by:

i) Writing to The Area Manager, NPWS Nattai Area, PO Box 3012 Wallacia NSW 2745.
ii) Submitting comments on-line at www.environment.nsw.gov.au; or
iii) E-mailing your submission to 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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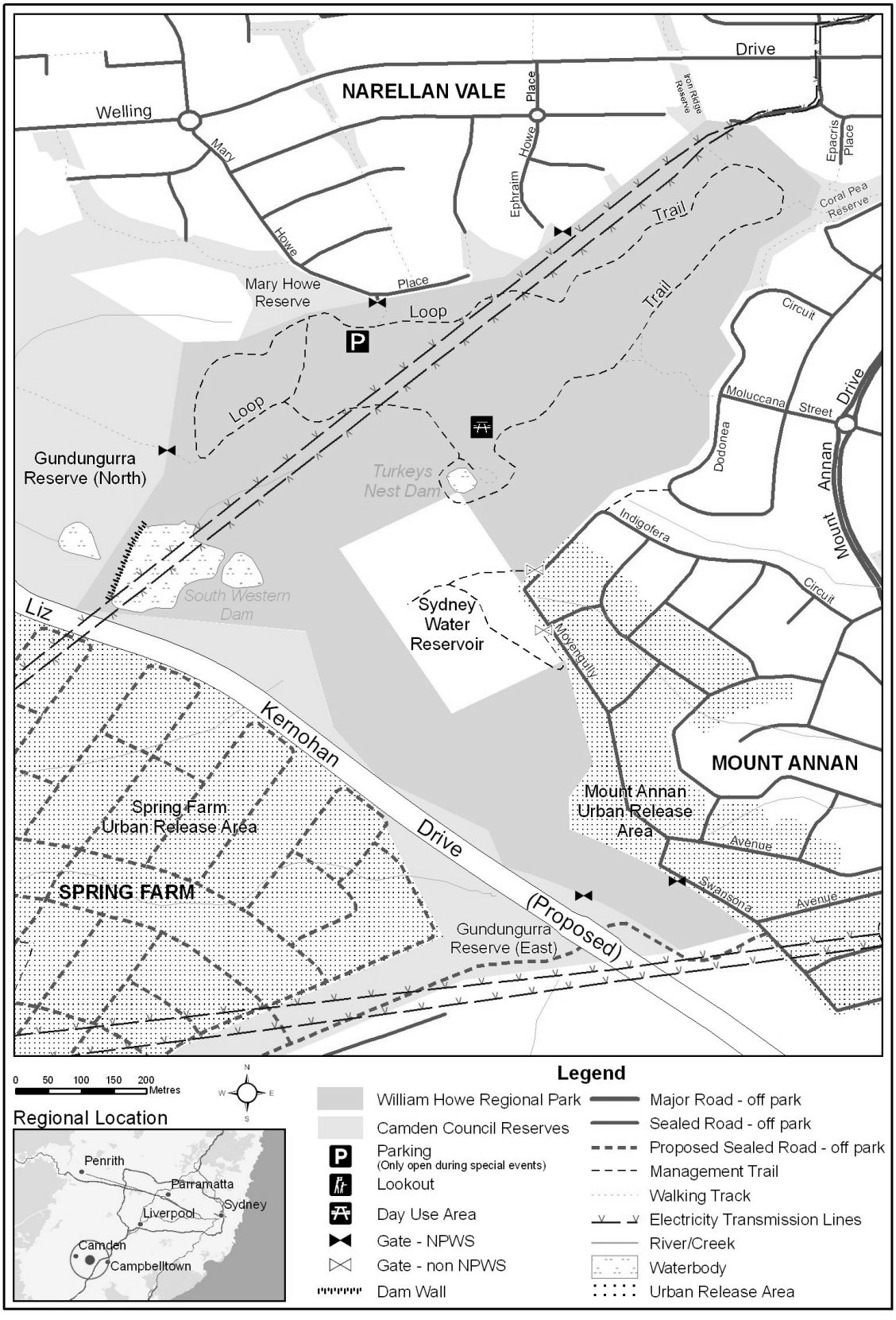
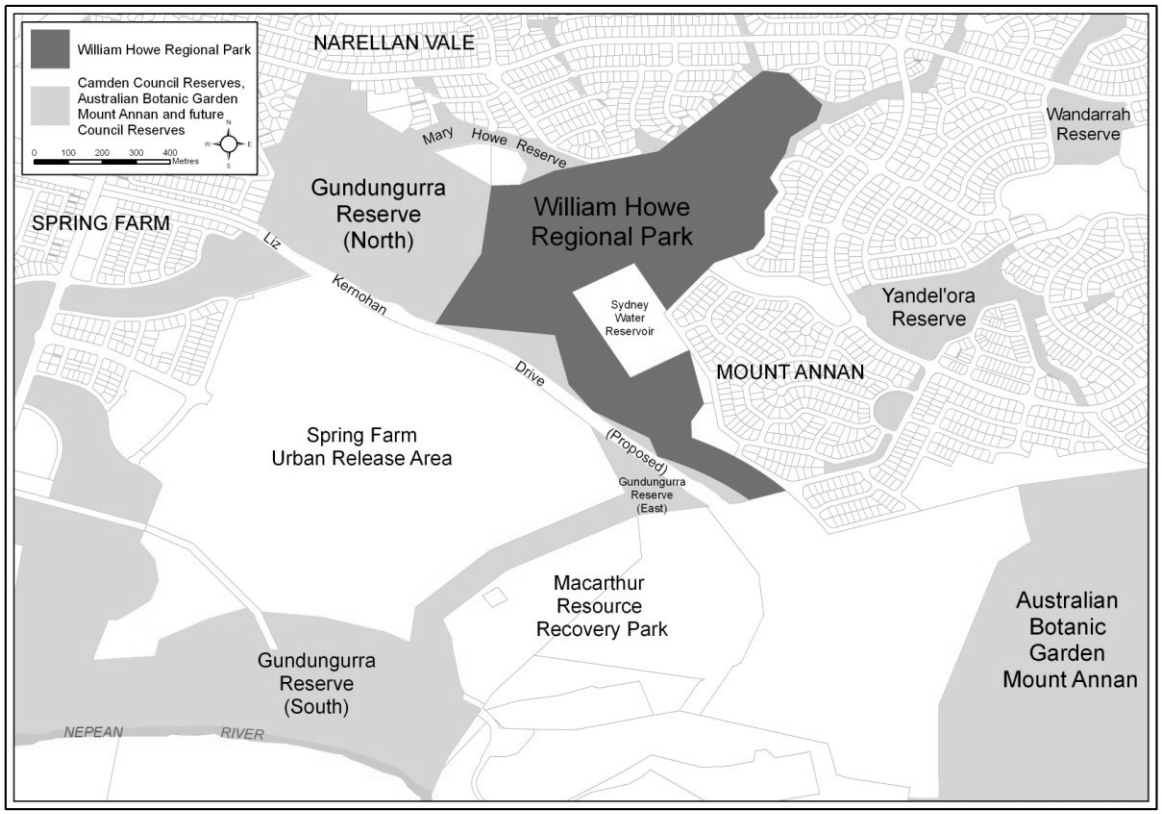


Map 2: Proposed Narellan and Spring Farm Bush Corridor



1.0 Introduction

1.1 Location, gazettal and regional setting

Features	Description
William Howe Regional Park	
Location	William Howe Regional Park (referred to as 'the Park' in this plan) is located in Narellan Vale, 70 kilometres south-west of Sydney's central business district, 6.5 kilometres north-east of Camden (see Map 1) and 9.5 kilometres south-west of Campbelltown.
Area	The Park covers 43.04 hectares. There is a significant indentation of 4.8 hectares in the centre of the Park on the eastern side that is owned by Sydney Water for reservoir purposes.
Reservation Date	The Park was gazetted as a Regional Park in 1998.
Previous Tenure	William Howe Regional Park was originally part of a 1214ha parcel of land granted to William Howe in 1818. The property was first named 'Eskdale' but later became known as 'Glenlee' and was largely used for dairy farming as well as other agricultural uses. In the late 1970s, the Macarthur Land Corporation (a State Government body) acquired the former Glenlee estate. The Corporation set aside the elevated areas and sold off large portions of lower lying land for urban development. In the early 1980s the elevated areas were placed under the control of the Department of Urban Affairs and Planning (DUAP). In 1998, the ridge top and surrounds were transferred to the NSW National Parks and Wildlife Service and gazetted as William Howe Regional Park.
Regional Context	
Biogeographic Region	The Park is situated within the Cumberland Sub-region of the Sydney Basin Bioregion. The Park is part of a larger network of protected lands in south-western Sydney that includes Gulguer Nature Reserve, Leacock Regional Park, Bents Basin State Conservation Area, Kemps Creek Nature Reserve, Mulgoa Nature Reserve and Western Sydney Regional Park. The Australian Botanic Garden Mount Annan also contributes to the network of conservation lands in the area.
Surrounding Land Use	The Park is bounded by the new residential areas of Narellan Vale, Mount Annan and Spring Farm to the north, east and south; Macarthur Resource Recovery Park to the south-east; Gundungurra Reserve and Mary Howe Reserve to the north-west, west and south; and Narellan Reservoir on the eastern boundary. Strategic land-use planning for the development of the surrounding urban areas includes a biodiversity corridor called the Narellan and

	Spring Farm Bush Corridor. The Park forms part of this proposed corridor (see Map 2) that will extend from the Nepean River at Spring Farm, through Gundungurra Reserve and William Howe Regional Park to the Australian Botanic Garden Mount Annan.
Other Authorities	The Park is situated within the areas of the Tharawal Local Aboriginal Land Council (LALC), Hawkesbury-Nepean River Catchment Management Authority and Camden Council.

1.2 Statement of significance

William Howe Regional Park is considered to be of significance for:

Landscape Values

- The Park has high scenic value as it includes the second most elevated area in the Camden Local Government Area. From the lookout, which is the main attraction of the Park, visitors have unobstructed panoramic views over the Australian Botanic Garden Mount Annan, the Razorback Range, the Blue Mountains, the Nepean River and prominent surrounding peaks.

- The prominent hills within the Park are largely vegetated and visible from the surrounding area that is rapidly being urbanised.

Biological Values

- The Park provides an important biodiversity link to nearby reserves and vegetation corridors that circulate through Narellan, Mount Annan, Spring Farm and along the Nepean River. Over time the biodiversity values of the Park will increase as the vegetation corridors are re-vegetated.

- The Park provides a range of habitats for native flora and fauna including a small pocket of remnant Cumberland Plain Woodland Critically Endangered Ecological Community, native grasses, two dams and non-endemic native plantings.

- The Park provides habitat for fauna including at least two vulnerable bat species listed under the *Threatened Species Conservation Act* (TSC Act).

Aboriginal Heritage Values

- The Park is within the traditional lands of the Dharawal[1] people who continue to value their association with their Country and sits near the intersection of three Aboriginal tribal boundaries.

- The Park's prominent and elevated setting and extensive uninterrupted views are incorporated into storylines and hold spiritual value to Aboriginal descendents.

- The commanding views over the region afforded by the elevated areas of the Park were important for communication, camping and spotting animals.

[1] 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).

- Turkey's Nest dam at the lookout was originally a soak used as a source of water for Aborigines.

- The Park is located within the 'Cowpastures' area, a prominent inter-generational gathering site for large numbers of Indigenous groups from as far as South Australia and Queensland to determine laws, settle disputes and organise marriages. The Cowpastures area was known as 'Yandel'ora Yugl' meaning Land of Peace Between Peoples. Smaller meetings were regularly held in the area to settle disputes between D'hawarals and their neighbours and arrange marriages.

Historic Heritage Values

- The Park formed part of the original Glenlee estate that was granted to William Howe around 1818. The Park retains relics from past farming practices including the unique Turkey Nest Dam located at the highest point of the Park.

- Together with Gundungurra Reserve, the grassland areas of the two parks form a cultural landscape of the European colonial period. This landscape that includes prominent hills visible from the surrounding landscape is becoming increasingly rare in the Cumberland Plain due to urban development.

Recreation and Tourism Values

- The Park provides informal recreation opportunities in a growing urban area including a lookout for view appreciation, picnic facilities, walking and cycling tracks and on-leash dog walking.

- The Park provides opportunity for the flying of model planes (gliders) as they receive uninterrupted westerly winds during late winter.

2.0 Management Context

2.1 Legislative and policy framework

The management of regional parks within New South Wales 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) 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 William Howe Regional Park except in accordance with this plan. This plan will also apply to any future additions to William Howe Regional Park. Should management strategies or works be proposed for the 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

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; and
- 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 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 William Howe Regional Park:

- Work collaboratively with the major landowners along the proposed Narellan and Spring Farm Bush Corridor to promote integrated and sustainable planning, maximise recreation facilities provision and linkages to recreation areas, facilitate community engagement, land management and conservation outcomes.

- Promote and facilitate the Park as a short stay destination and thoroughfare for walking and cycling.

- Enhance the Park's natural heritage values through the re-establishment of locally occurring native plant species within the Park landscape.

- Recognise and protect traditional and contemporary Aboriginal cultural heritage, landscape and spiritual values in consultation with the local Aboriginal community.

- Protect and enhance the Park's colonial cultural landscape, the lookout and associated view corridors.

- Work with relevant authorities to ensure the Park is a safe environment, free of vandalism and anti-social behaviour.

3.0 Values

This plan aims to conserve the natural, cultural and recreational values of William Howe 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 of the landscape, for example to plant and animal species used by Aboriginal people.

3.1 Geology, Landscape and Hydrology

William Howe Regional Park is located on the Cumberland Plain in the Sydney Basin amongst rolling hills adjacent to the floodplain of the Nepean River, the main drainage line for the Camden region. The topography of the Park comprises six hills, one being the second most elevated hill in the Camden Local Government Area reaching 176m A.H.D (Australian Height Datum). Some hillside slopes within the Park are steep at approximately 20-30 degrees (Spackman and Mossop 1999a). The hills that form the main northern ridgeline create a prominent skyline from surrounding areas of visual landscape value. The Park also contains areas of artificial landforms including berms, roadways and two dams constructed for past agricultural uses.

The Park is underlain by Triassic Age Bringelly Shales, the uppermost formation of the Wianamatta Group. These in turn overlie the Illawarra Coal measures that contain significant coal seam gas. The Blacktown soil landscape occurs in the Park and typically comprises shallow to moderately deep red and brown podzolic soils on undulating rises grading to deeper yellow podzolic soils on lower slopes and drainage lines. These soils have a

moderate to high erosion hazard when exposed to concentrated flows and slight to moderate erosion hazard when subjected to non concentrated flows. They are reactive (shrink and swell) and are of low fertility. Generally the subsoils are saline and sodic (Chapman et al 1989).

The Park is part of the Nepean River Catchment. As it is high in the landscape, little surrounding land drains through the Park. There are a number of intermittent drainage lines in the steep gullies on both the eastern and western sides of the Park. Slopes on the eastern side drain into an artificial lake in the suburb of Mt Annan and then into Narellan Creek. Slopes on the western side drain predominately to the west into Gundungurra Reserve and then south-west to the Nepean River. A large farm dam at the south-western corner of the Park disrupts the natural flow and drainage of water from the Park. Turkeys Nest Dam located at the lookout is small and partly fed by groundwater. Both dams were constructed for agricultural purposes.

The Park is located in an area of significant coal deposits and is within the South Campbelltown Mine Subsidence district that includes the surrounding suburbs of Narellan Vale, Elderslie, Mount Annan and Spring Farm (Camden Council 2011). The coal seam gas mining industry is rapidly growing in the surrounding area as part of the AGL Energy Limited Camden Gas Project that comprises 86 wells. Coal seam gas wells are being established close to the south-western boundary of the Park and one has been established within the northern portion of Gundungurra Reserve. No mining is permitted under the Park, however a subterranean easement has been created in the Park to construct pipelines for the AGL Camden Gas Project (See Section 5.2).

Issues:

- The soils within the Park are highly erodible.
- Failure of dam walls could result in seepage and inundation of low-lying properties.
- Activities relating to the mining of natural gas may result in environmental impacts in the nearby area and within the Park such as contaminated ground water.
- There is potential for salinity in the lower slopes and drainage lines of the Park where water accumulation is high. Salinity can impact infrastructure and vegetation (DIPNR 2003).
- Demand exists to install infrastructure within the Park to service the rapidly urbanising area that may adversely impact on park values (see Sections 3.4 and 3.5).

Desired Outcomes:

- Soil erosion, siltation and salinity are minimised.
- Landscape values of the Park are maintained.
- Catchment values and water quality are improved.
- Maintain view corridors especially from Turkeys Nest Lookout.

Management Response:

3.1.1 Design and undertake all works in a manner which minimises soil erosion and appropriately treat areas of erosion if they arise.

3.1.2 Conduct activities in a manner that ensures catchment values and water quality are protected and maintained. Engage with other authorities as needed to address issues that affect catchment values and water quality within the Park.

3.1.3 Undertake a risk assessment of the farm dams and determine the appropriate management approach that may include removal of dam wall structures.

3.1.4 Prohibit developments in the Park that negatively impact on the skyline.

3.1.5 Seek necessary approvals from the Mine Subsidence Board, Picton when undertaking relevant development on Park.

3.1.6 Engage with relevant authorities as needed to address potential impacts of gas extraction works on Park values.

3.1.7 Prepare and implement a View Management Plan to maintain important view corridors from vantage points within the Park.

3.2 Vegetation Communities and Native Plants

Prior to European settlement, the Park area was probably covered by open woodland and/or open forest. Following the first land grant in 1818, it was used for agricultural purposes and timber getting resulting in extensive clearing of native vegetation and an altered fire regime. Small pockets of disturbed Cumberland Plain Woodland dominated by Grey Box (*Eucalyptus moluccana*) (Tozer 2003), with less than 10% canopy cover, are mapped within the Park to the west of Turkey's Nest Lookout and around the south-western dam (NPWS 2000, 2002). Some of this vegetation may actually be part of a previous re-vegetation attempt.

Cumberland Plain Woodland is listed as a critically endangered ecological community under Part 2 of Schedule 1A of the NSW TSC Act (NSW Scientific Committee 2010a) and under the Commonwealth EPBC Act (DECCW 2010a)[2]. Cumberland Plain Woodland is facing an extremely high risk of extinction in the immediate future due to a loss of geographic distribution from land clearing, a key threatening process; 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).

Around 8 percent remains in small fragments scattered across the western suburbs of Sydney, of which only a small percentage is protected within national parks and other reserves. Within the Camden Local Government Area the other relevant reserves containing Cumberland Plain Woodland include George Caley Reserve, Gundungurra Reserve and the Australian Botanic Garden Mount Annan. The remaining fragments occur in areas subject to intense pressure from urban development.

Strategic planning for the development of the surrounding urban areas includes allocations for a biodiversity corridor called the Narellan and Spring Farm Bush Corridor for the purposes of this Plan. Ultimately, the corridor will extend from the Nepean River to the Australian Botanic Garden Mount Annan via Spring Farm, Gundungurra Reserve and William Howe Regional Park. Provisions have been made in the Master Plan for Spring Farm (Context Landscape Design 2003) as well as the Gundungurra Plan of Management to protect and

[2] Cumberland Plain Woodland is defined as Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

enhance the existing vegetation communities through conservation and regeneration measures (Environmental Partnership 2004).

There have been no systematic flora surveys within the Park, however Ian Perkins Consultancy Services recorded 37 indigenous native plants in 1999 (Spackman and Mossop 1999b). Data from flora surveys of the adjoining Spring Farm Urban Release Area, surrounding infrastructure works and from the Gundungurra Plan of Management also provide information on species likely to occur within the Park (UBMC 2002; Anne Clements and Associates 2002; HLA 2007).

The Spiked Rice–flower (*Pimelea spicata*) is the only threatened species that has a high potential to exist within the Park, as it has been located on the adjoining Gundungurra Reserve along the most western fence line (Environmental Partnership 2004). This species is listed as endangered under the TSC Act and the EPBC Act. Brown Pomaderris (*Pomaderris brunnea*) listed as vulnerable under the TSC Act and the EPBC Act, has also been recorded in Gundungurra Reserve in the Nepean River section of the reserve (NSW Wildlife Atlas records). This species is generally found on floodplains and creeklines and therefore has a lower probability of occurring within William Howe Regional Park.

In the 1980's, prior to the Park's gazettal as a Regional Park under the NPW Act, a replanting program was carried out along the northern ridgeline. Although many non-endemic species were used, it provides alternative habitat to the open grasslands and shrubs. Predominant species within the planting area include Spotted Gum (*Corymbia maculata*), Lemon-scented Gum (*C. citriodora*), Tallowwood (*E. microcorys*) and Grey Box (*E.moluccana*). The understorey comprises predominantly native grass including Kangaroo Grass (*Themeda australis*), Weeping Meadow grass (*Microlaena stipoides*) and *Poa* spp. grasses (Woolacots Consulting Engineers 2000). Some species within the replanted area are also typical of those found in Cumberland Plain Woodland such as Grey Box (*E. moluccana)*, Forest Red Gum (*E. tereticornis),* Narrow-leaved Ironbark *(E. crebra)* and Spotted Gum (*C. maculata*). There is potential to enhance the natural habitat values of the plantation by developing the ground and shrub layer. Selective removal of the non-endemic canopy trees in a staged process, (such as the invasive Tallowwood and Lemon-scented Gum) and replacement with endemic species will also enhance natural values over time.

Native grasses in open pasture are found extensively in the south-western corner and along the narrow strip of land in the most south-eastern portion of the Park. These grasslands comprise various native species including Weeping Meadow Grass (*Microlaena stipoides)* and Kangaroo Grass (*Themeda australis*) as well as many exotic grasses and herbs.

Shrublands within the Park are limited, often represented by exotic woody weed species. Thickets of native shrub *Bursaria spinosa* subsp. *spinosa* occur within the Park and provide important bird habitat.

The western side of the Park adjoins the northern portion of Gundungurra Reserve, combining to create one large open space for recreation and land conservation. Gundungurra Reserve contains a substantial community of Cumberland Plain Woodland on the western side and grassland on the eastern side that contains isolated trees and shrubs of species characteristic of Cumberland Plain Woodland. The eastern side of Gundungurra Reserve (which is in the same condition as the western side of William Howe Regional Park) has been defined as being in "very poor" or "poor" condition in the *Conservation Management Plan for the Restoration of Bushland at Gundungurra Reserve* (Camden Council 2005a). This is due to a limited canopy layer and deficient revegetation of native trees and shrubs. The dominant native canopy trees include *E. moluccana* and *E. tereticornis*. The shrubs include *Bursaria spinosa* subsp. *spinosa* and the ground covers include *Aristida* sp*., Austrodanthonia tenuior, Chloris ventricosa, Einadia spp.*, *Microlaena*

stipoides, Dichondra repens, Themeda australis and *Poa labillardierei*. In the Conservation Management Plan, it is noted that best practice guidelines for recovery of threatened species and ecological communities present in Gundungurra reserve will be used in this area, as it is weed infested, particularly with African Boxthorn *(Lycium ferocissimum)*. The area is also designated under the *Gundungurra Reserve Plan of Management* as a pasture/native grass area.

Several native aquatic plant species are found in both dams within the Park and need to be considered in association with any management strategies or future uses for the dams. These dams provide habitat for waterbirds and regionally significant species such as the eastern long-neck turtle. Any vegetation management strategies developed for the reserve should consider plantings that enhance the habitat value of these dams.

Strategies for the recovery of threatened species have been set out in the state-wide Threatened Species Priorities Action Statement (PAS). The Cumberland Plain Recovery Plan (DECCW 2010a) and the Cumberland Plain best practice guidelines (DEC 2005a) will provide guidance for the recovery and restoration of the critically endangered ecological community within the Park. A recovery plan has also been prepared for *Pimelea spicata* (DEC 2005b) which will provide management guidance if the species is found within the reserve.

An active volunteer bush regeneration group formed in 2011-12 conducts bushland restoration works in the Park.

Issues:

- No systematic flora surveys have been conducted of William Howe Regional Park.

- The critically endangered Cumberland Plain Woodland within the Park is degraded and capable of limited recovery as it is only a small pocket where disturbance from earthworks relating to dam construction, cultivation, fertilizer application and nutrient and moisture enrichment has occurred over the last 150 years. Furthermore, the planting of non-endemic species in the Park as well as the widespread growth of woody weeds provides significant challenges to recovery. Best practice measures for the recovery of Cumberland Plain Woodland will need to be applied. Based on monitoring and evaluation of previous attempts to re-vegetate pasture in the Cumberland Plain, natural assisted restoration will be challenging and experimentation with alternative restoration technologies is required (NSW Scientific Committee 2010a).

- All plans for revegetation, weed management and conservation works in William Howe Regional Park will need to be prepared in the context of the larger landscape planning framework of the Narellan and Spring Farm Bush Corridor, and in particular with Gundungurra Reserve. Consultation and collaboration will be necessary with stakeholders along the Narellan and Spring Farm Bush Corridor. It is anticipated that the section of corridor within the Spring Farm urban release area will be regenerated by 2025 when Camden Council will adopt the land management responsibilities. The corridor will be severed between Spring Farm and the Park by the proposed Liz Kernohan Drive.

- The extent of the weed problem in the Park is such that weed control and bush regeneration will need to be an ongoing management priority (refer to Section 4.1).

- The density of planting in the re-vegetated woodland area is high and may adversely affect the health of the planting over time. Introduced non-local native species such as Tallowwood and Lemon-scented Gum can be particularly invasive through seed spread.

Unless managed, these species will continue to have a negative impact of native vegetation communities in the Park.

- Resources are required to manage and expand the membership of the William Howe Regional Park community bush regeneration group.

- Activities that damage native vegetation in the Park include vandalism, vegetation and soil disturbance from rubbish dumping, bicycles, trail bikes, walkers and dogs, lawn mowing and suppression of the natural fire regime.

Desired Outcomes:

- Negative impacts on threatened plant species and endangered ecological communities are minimised.

- The habitat and populations of all threatened plant species and endangered ecological communities are identified, protected and maintained.

- Structural diversity and habitat values are restored in degraded areas.

- Biodiversity restoration works on Park improve native vegetation linkages along the Narellan and Spring Farm Bush Corridor.

- The Park's recreation values, cultural landscape and view corridors are considered and retained where suitable when revegetating and weeding.

- Vegetation restoration programs are conducted in consultation with the Tharawal LALC and other relevant Aboriginal groups and organisations.

Management Response:

3.2.1 Prepare and implement a landscape master plan for the Park in consultation with stakeholders that encourages the creation of vegetation linkages of locally occurring native species; protects cultural landscapes and identified view corridors; complies with best management practice for ecological restoration of native plant communities (e.g. DEC 2005a|); and improves the natural value of the woodland area in terms of structure, plant composition and area of vegetation coverage. Consideration should also be given to the staged removal of planted over-storey species which are not endemic to the local area and which have potential to outcompete locally endemic species. Additionally, consideration should be given to improving the habitat quality of the dams, fire buffer and public safety requirements, access and the need to retain open recreation areas, cultural landscapes and view corridors.

3.2.2 Undertake targeted surveys for threatened plant species likely to occur in the Park.

3.2.3 Implement relevant strategies in the PAS, recovery plans and best practice guidelines for threatened species and ecological communities present in the Park.

3.2.4 Where appropriate, work with the other land managers within the Narellan and Spring Farm Bushland Corridor, as well as other neighbours, community groups and Aboriginal groups and organisations to undertake strategic weeding, bush regeneration, planting and monitoring which facilitates coordinated land management, optimises conservation outcomes and increases community awareness and shared ownership.

3.2.5 Experiment with alternative restoration techniques to maximise the possibility of successfully restoring native vegetation, including ecological burns.

3.2.6 Reduce mown areas where appropriate and increase the height of the mown areas where a high native species component exists. Rest mown areas periodically to allow native grass seed to set and establish.

3.2.7 Investigate opportunities for research and monitoring partnerships with selected institutions.

3.3 Native Animals

Much of western Sydney's biodiversity has been lost since European colonisation. The decline in native fauna continues and can be attributed to loss of habitat and habitat fragmentation, competition with introduced animals for food and shelter and predation by introduced species (NPWS 2007). Although much of the biodiversity of western Sydney remains in isolated pockets of remnant vegetation, what remains, sustains a number of species including threatened species (NPWS 2007).

A 2007 Urban Bushland Biodiversity Study found that prior to colonization, western Sydney would have supported approximately 60 species of native mammals (of which only 17 species continue to exist in the region); at least 336 species of native birds (of which 38 have either disappeared from western Sydney or their numbers have greatly reduced); at least 31 native species of frogs; and at least 53 species of native reptiles, some of which struggle to exist in fragmented habitat where their range requires several hectares (NPWS 2007).

The current habitat value of the Park and adjoining Gundungurra Reserve is not high, however the environments that have been created including dams, the reforested area and the weeds do provide habitat for native fauna species. Potential exists for the habitat value of the Narellan and Spring Farm Bush Corridor to be enhanced over time through revegetation and weed management.

A fauna study of William Howe Regional Park was undertaken in 2007 (Leary 2007). According to the NSW Wildlife Atlas (OEH 2011a) results and the Leary survey, 8 native amphibians, 6 reptiles, 35 birds and 9 mammal species have been recorded in the Park. A fauna habitat study by Conacher Travers (2002) reported a total of 134 fauna species recorded within or adjacent to the neighbouring Gundungurra Reserve. This consisted of 87 bird, 10 reptile, 6 amphibian, 27 mammal and 4 mollusc species which includes introduced species (Environmental Partnership 2004).

Two species listed as vulnerable under the TSC Act, the Grey-headed Flying Fox (*Pteropus poliocephalus*) and the Eastern Freetail Bat (*Mormopterus norfolkensis*) have been recorded in the Park (Leary 2007, OEH NSW Wildlife Atlas 2012). The Grey-headed Flying Fox is also listed as Vulnerable under the Commonwealth EPBC Act. Other threatened species recorded within a 5 kilometre radius of the Park or likely to occur within that area are indicated in Table 1 below.

Table 1: Threatened Fauna Species found within a 5km radius of William Howe Regional Park

Scientific name	Common name	Status
Oxyura australis[#]	Blue-billed Duck	TSC Act: Vulnerable
Stictonetta naevosa[#]	Freckled Duck	TSC Act: Vulnerable
Ninox strenua	Powerful Owl	TSC Act: Vulnerable
Glossopsitta pusilla	Little Lorikeet	TSC Act: Vulnerable
Neophema pulchella[#]	Turquoise Parrot	TSC Act: Vulnerable
Hieraaetus morphnoides	Little Eagle	TSC Act: Vulnerable
Stagonopleura guttata[#]	Diamond Firetail	TSC Act: Vulnerable
*Petroica phoenicea**	Flame Robin	TSC Act: Vulnerable
*Petroica boodang**	Scarlet Robin	TSC Act: Vulnerable
*Melanodryas cucullata cucullata**	Hooded Robin (south-eastern form)	TSC Act: Vulnerable
Daphoenositta chrysoptera	Varied Sittella	TSC Act: Vulnerable
Chthonicola sagittata	Speckled Warbler	TSC Act: Vulnerable
Melithreptus gularis gularis[#]	Black-chinned Honeyeater (eastern subspecies)	TSC Act: Vulnerable
Calidris ferruginea[*]	Curlew Sandpiper	TSC Act: Endangered
Circus assimilis	Spotted Harrier	TSC Act: Vulnerable
*Saccolaimus flaviventris**	Yellow Bellied Sheathtail Bat	TSC Act: Vulnerable
Miniopterus schreibersii oceanensis	Eastern Bentwing Bat	TSC Act: Vulnerable
Chalinolobus dwyeri	Large-eared Pied Bat	TSC Act: Vulnerable EPBC Act: Vulnerable
Falsistrellus tasmaniensis	Eastern false Pipistrelle	TSC Act: Vulnerable
Meridolum corneovirens	Cumberland Plain Snail	TSC Act: Endangered
Scoteanax rueppellii	Greater Broad-nosed Bat	TSC Act: Vulnerable
Myotis macropus	Southern Myotis	TSC Act: Vulnerable

Source: OEH NSW Wildlife Atlas September 2012

[#]Very rare visitor at best

* Migratory, seasonal visitor

The Blue-billed Duck and Freckled Duck are only occasional visitors to western Sydney and are unlikely to occur within the Park (NPWS 2007). The Yellow-bellied Sheathtail Bat would only be a visitor during the summer months if at all. The three species of Robin are rare winter visitors and the Diamond Firetail is also unlikely to be recorded in the Park as its numbers have declined across the Cumberland Plain (Leary 2012). The dams provide suitable foraging habitat for both the Greater Broad-nosed Bat and the Southern Myotis and it is possible that these two species are occasional visitors to the Park. Powerful Owls forage over large areas and it is also possible that the species occasionally utilises the Park, although the availability of suitable prey species in likely to be low (Leary 2012).

In addition to threatened species, six regionally significant species have been recorded in the Park (Leary 2007) and are listed in Table 2 below. The 1995-1996 Western Sydney Urban Bushland Biodiversity Survey (NPWS 1997) identified regionally significant species that exist within south-west Sydney. Nine of these species could occur within the Park and are listed below.

Table 2 Regionally Significant Species

Scientific name	Common name
*Chelodina longicollis**	Eastern Snake-necked Turtle
*Wallabia bicolour**	Swamp Wallaby
*Coturnix ypsilophora**	Brown Quail
*Circus approximans**	Swamp Harrier
*Smicrornis brevirostris**	Weebill
*Cisticola exilis**	Golden-headed Cisticola
Phaps chalcoptera[#]	Common Bronzewing
Falcunculus frontatus[#]	Crested Shrike-tit
Aquila audax[#]	Wedge-tailed Eagle
Haliastur sphenurus[#]	Whistling Kite
Acanthiza chrysorrhoa[#]	Yellow-rumped Thornbill
Taeniopygia guttata[#]	Zebra Finch
Tachyglossus aculeatus[#]	Short-beaked Echidna
Varanus varius[#]	Lace Monitor
Pogona barbata[#]	Bearded Dragon

* Recorded within William Howe Regional Park (Leary 2007)
[#] 1995-1996 Western Sydney Urban Bushland Survey (NPWS 1997)

The Cattle Egret (*Ardea ibis)* and the Fork-tailed Swift (*Apus pacificus*) both listed under the Japan - Australia Migratory Bird Agreement (JAMBA) and the China - Australia Migratory Bird Agreement (CAMBA) could occur in the Park, along with the White-bellied Sea-eagle (*Haliaeetus leucogaster*), listed under CAMBA (Leary 2012).

Strategies for the recovery of threatened species are 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 that maybe relevant to William Howe Regional Park include the Large Forest Owls (DEC 2006b) and the Grey-headed flying fox (DECCW 2009).

Issues:

- The current habitat value of the Park and adjoining Gundungurra Reserve is not high due to vegetation fragmentation and the lack of natural bushland, tree hollows and shrub layer due to previous clearing activity and altered fire regimes.

- Few fauna surveys have been conducted of William Howe Regional Park.

- The Narellan and Spring Farm Bush Corridor will be severed by the proposed Liz Kernohan Drive abutting the south-western portion of the Park which will create a dangerous obstacle for terrestrial fauna crossing the road. It is anticipated that the link road will be constructed within the next 10 years.

- Several woody weeds in the Park, particularly African Boxthorn, provide important habitat for some small native bird species, predominantly the wren and finch species that are common in the area.

- Visitors can impact upon native fauna through disturbance, the presence of dogs and removal of habitat through illegal fire wood and bush rock collection. Foxes and wild cats are also known to exist within the Park and can suppress native fauna species numbers (see to section 4.1).

- Currently there are no hollow bearing trees on the Park to provide habitat. Loss of hollow-bearing trees and removal of dead wood and dead trees are both listed as key-threatening processes under the TSC Act.

Desired Outcomes:

- The habitat and populations of native fauna species in the Park are identified and conserved.
- Negative impacts on threatened fauna species are minimised.
- Habitat values are restored in degraded areas.
- A diversity of habitat types is maintained in the Park.
- On-park native fauna conservation activities are undertaken in consideration of the wider Narellan and Spring Farm Bush Corridor.

Management Response:

3.3.1 Implement relevant strategies in the PAS and recovery plans and utilise best practice guidelines for threatened fauna species present in the Park.

3.3.2 Manage weeds within the Park in a staged approach that is sensitive to the habitat requirements of native fauna.

3.3.3 Work collaboratively with other land managers within the Narellan and Spring Farm Bush Corridor to improve habitat corridor linkages.

3.3.4 Where possible in conjunction with Camden Council, formulate a monitoring and evaluation program to periodically assess changes in fauna populations and to better understand the habitat values and management requirements of the Park and Gundungurra Reserve.

3.3.5 Develop and implement protocols for mowing and weed management to protect habitat requirements of native fauna.

3.3.6 Work collaboratively with Camden Council to promote responsible pet ownership and management through signage and education programs.

3.3.7 Liaise with Camden Council, the Roads and Maritime Services and the Department of Planning and Infrastructure to include provisions for the movement of terrestrial and arboreal fauna in the final design of Liz Kernohan Drive through traffic calming devices and the creation of passageways or over-passes as well as ongoing monitoring.

3.3.8 Investigate opportunities for research and monitoring partnerships with selected institutions.

3.3.9 Ensure that the landscape master plan for the Park considers options for the improvement of fauna habitat quality through such means as the provision of artificial tree hollows, augmentation of coarse woody debris (addition of logs), sympathetic planting on the fringes of dams for waterbirds and augmentation of muddy bank edges etc.

3.4 Aboriginal Heritage

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.

Aboriginal sites are places with evidence of Aboriginal occupation or other aspects of Aboriginal culture. They are important as evidence of Aboriginal history and as part of the culture of local Aboriginal people. 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 in the promotion and presentation of Aboriginal culture and history.

The region in which William Howe Regional Park is situated has a long history of Aboriginal occupation as groups were drawn to the area because of its proximity to the Nepean River and the plentiful supply of food and water (Camden Council 2010).

The Park is situated within the area of the Tharawal Local Aboriginal Land Council and within the area originally occupied by the Dharawal[3] or Tharawal peoples. The Dharawal people were divided into two groups. The Sweet Water D'harawals occupied those lands where 'the rivers run the wrong way' and include the Nepean, Wollondilly, Georges, Cataract and Nattai Catchments, whilst the Saltwater D'harawal occupied the lands from Kurnell Peninsula and Botany Bay, south to Shoalhaven and from the coast to the Illawarra escarpment (Royal Botanic Gardens and Domain Trust 2013). The Dharawal people in the Camden and Campbelltown areas consisted of some forty or fifty clans. They named the area "Yandel'ora Yugl" which means Land of Peace Between Peoples (Spackman and Mossop 1999a, Royal Botanic Gardens and Domain Trust 2013). The Dharawal clans, including the Cubbitch Barta, the coastal Gweagal and the Wodi-Wodi of the Illawarra, travelled through and utilised the rich resources of this landscape (Dallas and Corby 2005).

The area is also important to the Gandangara (or Gundungurra) Clan and Dharug language groups whose northern and southern boundaries respectively were located in the vicinity of the Nepean River in the Camden area. This area was an important inter-generational meeting place for Aboriginal people from as far away as Queensland, Victoria and South Australia who met periodically to determine laws, settle disputes and arrange marriages. More regularly, smaller meetings were held in the area to settle disputes between Dharawals and their neighbours and to arrange marriages (Spackman and Mossop 1999a).Nearby, "Mt Annan was known as the chief law-making place, and the leaders of each tribe would gather on the summit once every generation and the laws would be established" (Royal Botanic Gardens and Domain Trust 2013). Mt Annan is located within the Australian Botanic Gardens, that is part of the Narellan and Spring Farm Bush Corridor.

According to some Aboriginal descendants, the most elevated parts of William Howe Regional Park were used as a lookout, for communication, for meetings and for camping. Turkeys Nest Dam was previously a soak fed by groundwater and was probably used as a

[3] 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).

water supply and to source food such as ducks and frogs. These geographic features also feature in Aboriginal storylines and hold spiritual values (Bodkin 2012).

By the mid 1800's very few Dharawal people remained in the area largely due to high rates of mortality from disease. The other main causes of population decline due to death or population dispersal were armed conflict with European soldiers and settlers, land dispossession, drought and food shortages (Royal Botanic Gardens and Domain Trust 2013).

In 2010 an archaeological study was conducted within William Howe Regional Park as part of the environmental assessment for the Sydney Water Trunk Main that extended from the reservoir adjoining the Park to Spring Farm. No sites were identified within the narrow strip of the Park that was under investigation (Biosis 2010) and no records of relics exist to date within the Park. Numerous Aboriginal sites have however been located in the surrounding area including Gundungurra Reserve, as part of studies conducted for the urban release areas and associated infrastructure (Dallas and Irish 2001; Dallas and Corby 2005; Barton 1996; Haglund 1989; Byrne 1994 and Hanranhan 1981). These sites are largely isolated finds, low concentration artefact scatters of stone tool manufacture, discarded tools (open camp sites) and scarred trees (HLA 2007; Dallas and Corby 2005). Consultation with Aboriginal custodians during the 2010 Biosis study for the Sydney Water Trunk Main revealed that Gundungurra Reserve is an area of significance. The study area that included William Howe Regional Park was also identified as having a high level of significance to them, however the significance was not defined (Biosis 2010).

Ten open camp sites have been located in Gundungurra Reserve (Dallas and Corby 2005; Dallas and Irish 2001). The majority of these sites were identified in disturbed degraded contexts and were considered not to be *in situ* deposits due to movement from erosion and human activity. While they have been assessed as having little or no archaeological research potential, (Dallas and Corby 2005) they do have educational value as they represent a pattern of local Aboriginal occupation on elevated landscape with expansive district views for communication, camping and spotting animals (Dallas and Corby 2005).

Issues:

- The Aboriginal cultural and heritage values of the Park are not fully known partly due to a lack of archaeological investigation.
- The potential exists to find archaeological artefacts but not necessarily *in situ*. Sites may have been disturbed by past land uses, erosion and artefact collection.
- There is potential for Aboriginal sites to be impacted by development, bush regeneration, informal trails and associated remedial works.
- Given the Aboriginal significance of elevated areas, any proposal to install telecommunications towers in the Park may significantly impact on the Aboriginal cultural heritage values of the Park.

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 Aboriginal cultural values is improved.

- Impacts on Aboriginal heritage values are minimised.

Management Response:

3.4.1 Continue to consult and involve the Tharawal LALC, the Cubbitch Barta Native Title Claimant Aboriginal Corporation and other interested Aboriginal community groups in the management of the Park, including the management and interpretation of Aboriginal sites and places as well as natural values.

3.4.2 Undertake an archaeological survey and cultural assessment in consultation with the Aboriginal community prior to conducting works with the potential to impact on Aboriginal sites or values.

3.4.3 Should Aboriginal relics be found within the Park, investigate and record them on the OEH Aboriginal Heritage Information Management System (AHIMS) database.

3.4.4 In partnership with Aboriginal and land management stakeholders, encourage a coordinated approach to the interpretation of Aboriginal culture and heritage along the Narellan and Spring Farm Bush Corridor.

3.5 Historic Heritage

Heritage places and landscapes are made up of living stories as well as connections to the past which 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. The NPWS conserves the significant heritage features of NSW parks and reserves.

In 1812 Governor Macquarie began to grant large tracts of land around Camden for farming (Camden Council 2010) that included a 1214 ha land grant to William Howe in 1818 known as Glenlee. William Howe Regional Park formed part of this estate (Spackman and Mossop 1999a) that expanded to 2832 ha by 1820 (OEH 2013). By this time, William Howe was shipping wool to London. He also produced wheat and meat for the government stores and dairy products for the Sydney market in the 1820s (OEH 2013). William Howe was a Scottish free settler who migrated to Sydney with his family in 1816. Howe also constructed a homestead for his Glenlee estate in 1823 that still stands in Menangle Park. Howe held eminent positions in the community including magistrate and Superintendent of the Campbelltown Police (Parsons 2013).

In 1849, the Glenlee property was conveyed to executors as payment for mortgage default. William Howe died in 1855 and his wife eventually sold the property to James Fitzpatrick in November 1859. James Fitzpatrick continued to expand the estate in the following years making it one of the largest holdings in the district. The property remained in the Fitzpatrick family until the late 1960's (OEH 2013).

In the late 1970s the NSW Government's Macarthur Land Corporation acquired extensive amounts of land in the Camden and South Mount Annan areas, including some former lands of the Glenlee estate. The corporation sold large portions of the lower lands for urban development. In 1998 the area that now forms William Howe Regional Park was transferred to the Minister for the Environment and in the same year the land was gazetted as William Howe Regional Park (Spackman and Mossop 1999a).

Camden *Development Control Plan* (DCP) (Camden Council 2011) has identified that William Howe Regional Park contains important view corridors and colonial cultural landscapes that are iconic in the Camden local government area. The native grasslands/rural pasture, are noted as representing one of a few of the remaining open pastures in this part of Camden. Important views that have also been identified in the DCP include the view from Turkeys Nest Lookout south to Macarthur Resource Recovery Park (referred to as Jack's Gully in the DCP) and west to the urban release areas that extend further to the Blue Mountains.

Turkey's Nest dam was constructed prior to 1947 and is a unique dam structure with walls on all four sides. Built on a natural soak at the highest point of the Park next to the existing lookout, the dam was used as a gravity-feed water supply for the surrounding rural lands to irrigate the property and fill stock troughs. The dam is an intact example of an earth dam and demonstrates early small agricultural dam building practices (Tropman and Tropman 2004). The infrastructure that supported the water supply function is now either buried or has been removed. Turkeys Nest Dam is listed on the NPWS *Historic Heritage Information Management System* (HHIMS). It is also identified in Camden Council's Development Control Plan 2011 as having potential heritage significance to Camden in a cultural and visual landscape context.

Besides the rural landscape, the Park contains limited visible remnants of prior European agricultural land use apart from evidence of old tracks, berms and dams (Spackman and Mossop 1999a).

Issues:

- The surrounding rural cultural landscape is gradually diminishing as it is replaced with urban development. Urbanisation is further isolating the Park from the Nepean River valley and fragments of former agricultural lands in the area such as the Australian Botanic Garden Mt Annan (Spackman and Mossop 1999a).

- The Park and the adjoining eastern portion of Gundungurra Reserve form part of the same rural cultural landscape. NPWS and Camden Council need to plan and coordinate land management practices including revegetation and weed management to preserve the cultural landscape where appropriate across both land tenures.

- Woody weed invasion is threatening the scenic and landscape values of the Park.

- There is a lack of information on the history of the artificial landforms within the Park including the berms and old tracks.

- Any proposal to install visible utility infrastructure in any part of the Park may significantly compromise its cultural and visual importance to visitors and to those viewing the Park from the surrounding urban areas (see Management Response 3.1.4).

- Former agricultural tracks need to be investigated for their potential to form part of the formal Park track and trail system (see Management Response 3.6.4).

Desired Outcomes:

- The cultural heritage and visual landscape values of the Park are identified, recorded, protected and interpreted for public education.
- Negative impacts on historic heritage values are minimised.

Management Response:

3.5.1 Record historic sites and include items on the OEH Historic Heritage Information Management System (HHIMS) register. Investigate the opportunity to undertake archaeological research particularly on Turkeys Nest dam, the agricultural berms and old tracks.

3.5.2 Undertake an archaeological survey and cultural assessment prior to works with the potential to impact on historic sites and places.

3.5.3 Protect and manage historic heritage features and values according to their significance.

3.5.4 Liaise with land managers along the Narellan and Spring Farm Bush Corridor to manage historic heritage collaboratively and strategically to retain the colonial cultural landscape and view corridors identified in Camden DCP 2011.

3.5.5 Continue to manage Turkeys Nest dam as a small wetland environment, maintained by rainfall and the natural aquifer.

3.6 Visitor Use

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.

According to the *Camden Recreation and Leisure Strategy* 2005, walking is the most popular of all physical activities in Camden closely followed by cycling (Camden Council 2005b). William Howe Regional Park is well placed to facilitate these activities as current recreation activities are centred around low impact, self-reliant nature-based recreation such as bushwalking, jogging, bird watching, on-leash dog walking and cycling/ mountain biking. Turkeys Nest Lookout, situated on the second highest hill in the Camden Local Government Area, is the most popular destination within the Park and offers spectacular views of the Camden Valley and Razorback Range. Visitors can also enjoy the two dams, the woodland and rural landscapes. The knoll on the Sydney Water land is popular for the launching of remote controlled model gliders that fly over the Park, particularly in late winter when the favourable westerly winds occur.

The Park is primarily used by residents from the adjoining suburbs of Narellan Vale and Mount Annan. The Park also services the growing demand for informal recreation areas in western Sydney, particularly within a 30 minute travel time from home (DECC 2008). The majority of visitor use occurs on weekends but it is also popular in the early morning and late afternoon throughout the week. The NPWS Visitor website contains visitor information on the Park at www.nationalparks.nsw.gov.au/william-howe-regional-park.

The main entrance to the Park is located at the curb and gutter car park off Mary Howe Place that can park approximately 10 vehicles when it is open during special events. Vehicle access to the car park is restricted due to inappropriate behaviour after hours (see section 4.3). Current parking needs are satisfied by unlimited on-street car parking around the peripheree of the Park. Public vehicle access within the Park is prohibited.

Small pocket parks owned by Council on the northern and eastern boundaries contain pedestrian/cycle access gates to William Howe Regional Park at the intersection of Dodonea Circuit and Moluccana St, Narellan Vale and along a track that links to Epacris Place,

Narellan Vale. Another sealed track for cyclists and pedestrians exists from Welling Drive via Janes Circuit and Ann Place, Narellan Vale. The Council off road combined pedestrian and cycle path circulates from Welling Drive, through Gundungurra Reserve and onto the loop trail within William Howe Regional Park.

There is limited access to the Park for people with disabilities as there is only a small section of sealed trail on Park (near the car park) linking to Council pathways via the end of Mary Howe Place and Henry Place, Narellan Vale. This path also links to Welling Drive via Council land.

The loop trail is approximately 2.2 kilometres long. It begins at the car park and loops around the northern section of the Park via Turkeys Nest Lookout, taking approximately 45 minutes on foot. The loop trail also links up with a trail through Gundungurra Reserve making a seamless connection for the visitor with additional trail options of varying length. Other short trails link with the loop trail at various locations from different entry points to the Park.

A dry stone retaining wall has been constructed to support the unsealed loop trail for walkers and cyclists. A formal viewing area is located at the highest point in the Park at Turkeys Nest Lookout and comprises a level area of low concrete and porphyry clad walls in a circular formation for seating and the presentation of interpretative information. The aim of the lookout was to enhance experience of the views and increase accessibility. A ramped concrete pathway for mobility impaired visitors and a pathway with stairs lead to low key picnic facilities in a sheltered area at the lookout. The picnic facilities originally comprised three picnic tables but currently comprise one. An informal picnic area is also located in an open grassed area on the adjacent ridgeline to the west of the lookout and includes three benches. Picnic facilities and signage are limited in the Park as they are regularly damaged due to vandalism (refer to section 4.3). A tap provides drinking water for visitors at the car park.

In 1999, Spackman and Mossop undertook consultation with local residents and users of the Park. In 2011 and 2012 the NPWS also undertook consultation. During these periods, local residents and park users indicated their appreciation of the Park's natural and peaceful setting, less structured activities, walking tracks, lack of development and closeness to home. Residents generally supported on leash dog walking and cycling but desired more seating/ picnic areas, interpretative signage, accessible paths, separate trails for active and passive recreation, kids play areas and more ranger interaction through community education and surveillance.

Future Use and Access

Stakeholders who are land managers along the Narellan and Spring Farm Bush Corridor are working towards the preparation of a recreational needs analysis and corridor precinct plan that will determine what recreational facilities and opportunities are required as the population increases and which land is most suitable to provide active and passive recreation. In this context, consideration may be given to utilising commercial vendors for provision of visitor services in the Park, such as mobile cafes and recreational/sports providers. Other opportunities to attract visitors could be co-managed with Camden Council in line with the Gundungurra Reserve Plan of Management. Facilities could include new mountain bike tracks, board walks near the large dam, new picnic areas and rest spots, club based activities, senses trails, and children's play areas as well as new access points and a new car park.

Until such plans are made, the Park will continue to facilitate a short stay (up to 2 hours), urban respite experience for the 'families, friends and community' segment as well as a

regional open space link for the 'outdoor pursuits' segment through the walking trail loop via the lookout. Toilet facilities and BBQs are not warranted at this stage.

Potential exists to create new pedestrian and cycleway linkages to the Park via future adjoining Council pocket parks, riparian buffer zones and the Narellan and Spring Farm Bush Corridor. Bike access to the Park will improve when the Macarthur Regional Recreational Trail Concept is implemented. It is an initiative of Landcom and is designed for recreational and commuting purposes. The track will eventually link with the existing Nepean River Cycleway from Camden, cross the Nepean River, continue through the back of Spring Farm into the Mount Annan residential area (adjacent the Park), through the Australian Botanic Garden Mount Annan and the University of Western Sydney campus before reaching Macarthur Square train station in Campbelltown.

According to Camden Councils planned pedestrian and cycle network, potential exists for cycle linkages from the Park to be extended to the Australian Botanic Garden Mount Annan and onto the future Macarthur Regional Recreation Trail. Plans also exist for the pedestrian and cycle path to extend from Spring Farm via the western boundary of Gundungurra Reserve and link to the existing off road walking and cycle trail through Gundungurra Reserve and the Park loop trail. Linkages could also be made with Birriwa Reserve and the Mount Annan market place to the north. Another cycleway is proposed to circulate from Spring Farm along the odour buffer of the Macarthur Resource Recovery Park to the south-east of the Park that currently contains no trails or formal access points (Camden Council 2011).

The Park contains evidence of previously used trails formed when the land operated as a farm. Currently these trails are closed however they may be re-opened to form additional connections for recreational purposes in the future.

Issues:

- Camden Council is one of the fastest growing areas in Australia with a current population of 56,000 people. Under the Metropolitan Strategy, Camden's population is forecast to increase dramatically to 256,000 by 2040 at an annual growth rate of 13%. (Camden Council 2010a). New linkages to the Park will be required along with improvements to existing ones from the surrounding urban areas. The Park will also need to respond to a rapid growth in visitation and changes in recreation needs over the coming decades.

- The Park has limited access by public transport and no bus stops are planned along the proposed Liz Kernohan Drive (Camden Council 2011), which will be a major arterial road, limiting Park access.

- A strong partnership with Camden Council is required to deliver a seamless visitor experience for William Howe Regional Park and Gundungurra Reserve, particularly in terms of providing and maintaining shared tracks and trails, fencing, access and visitor facilities. The need for this cooperative relationship is also emphasised in other strategic planning documents for the area including the *Camden Open Space Strategy 2002*, the *Camden Recreation and Leisure Strategy 2005*, *the preliminary unpublished Draft William Howe Regional Park Plan of Management 1999* and the *Gundungurra Reserve Plan of Management 2004*. The *Gundungurra Reserve Plan of Management*, in particular, contains integrated proposals such as joint trails, car park areas and new picnic areas and board walk, with a focus around the large dam within the Park.

- Visitor use levels are currently below capacity, partly due to a general lack of information on the Park and a perception that the Park is not available to the public due to limited

access points, signage and facilities (Spackman and Mossop 1999a). The main entrance to the Park is off Mary Howe Place, a residential cul-de-sac with no through traffic, which limits public access and knowledge of the Park's existence. This is an inappropriate entrance for the long term and opportunities may arise to create an alternative more noticeable entrance to the south-west of the Park once the proposed Liz Kernohan Drive has been constructed, in accordance with the *Gundungurra Reserve Plan of Management* (Figures 4.2 and 6.1) and the preliminary Draft Plan of Management for William Howe Regional Park (Spackman and Mossop 1999a).

- NPWS will need to work in collaboration with other public open space land managers in the Narellan and Spring Farm Bush Corridor to create a well-defined recreation corridor that is a positive contribution to the recreation assets of south west Sydney.

- Arson, graffiti, vandalism and illegal use of trail bikes and the car park are serious problems that limit visitor enjoyment (see Section 4.3).

- The odour from the Macarthur Resource Recovery Park (also known as Jack's Gully Landfill) to the south of the Park can be offensive to Park visitors when the wind blows from the south-east. An odour buffer zone has been included in the Camden DCP 2011 to manage odour for the Spring Farm Urban Release Area. The buffer zone includes a small portion of Gundungurra Reserve up to the southern boundary of William Howe Regional Park.

- Once boundary fences have been established around Gundungurra Reserve, internal fences between William Howe Regional Park and Gundungurra Reserve can be removed to improve connectivity for visitors.

- Electricity transmission lines from Spring Farm, over the large dam and towards the lookout impact on views.

- Dog waste is currently unmanaged and can detract from the visitor experience if left on walking trails as well as increase nutrient content in the soil and dams, promote weed growth and disturb native wildlife.

<u>Desired Outcomes:</u>

- The Park forms part of the recreation corridor along the Narellan and Spring Farm Bush Corridor as per the *Camden Open Space Strategy* 2002 and the *Camden Recreation and Leisure Strategy* 2005 to meet the needs of the growing population.
- Visitation is increased through better park promotion and access via new cycle and pedestrian linkages and a new and more accessible Park entrance and car park.
- The Park and Gundungurra Reserve are managed in a seamless way to maximise the visitor experience.
- The Park provides a safe and enjoyable experience for visitors.
- The Park continues to provide for short stay activities such as picnics, cycling, walking, cross country running and on-leash dog walking.
- Recreational facilities and activities in the Park do not conflict with the natural or cultural values of the Park or compromise the enjoyment of other visitors and neighbours.

- Suitable commercial operators are encouraged to provide services to improve the visitor experience, attract more visitors and provide surveillance to help manage anti-social behaviour.

Management Response:

3.6.1 Work with land managers along the Narellan and Spring Farm Bush Corridor to prepare a recreational needs analysis and corridor precinct plan that will inform a site facilities plan for the Park. In the meantime, manage the Park principally as a day use area.

3.6.2 Improve access to the Park by providing a major access point and new shared car park (with Gundungurra Reserve) off the proposed Liz Kernohan Drive to the south-west of the Park (in consultation with Camden Council).

3.6.3 Facilitate integration of the Park with Council's plans for regional cycle and pedestrian routes.

3.6.4 Review connectivity of tracks and trails on Park and develop a prioritised program for their hardening or closing and the creation of new trails based on connectivity, importance, impacts on natural and cultural values and whether they were former tracks during the Glenlee Farm period.

3.6.5 Actively promote public transport options to the Park in consultation with Camden Council and the Roads and Maritime Services.

3.6.6 Consider the use of commercial vendors for community and recreation services that are complementary to maintaining the Park's natural and cultural values, that comply with the NPW Act and Regulations and that increase use of the Park.

3.6.7 Encourage utilisation of the Park for community and sporting events that are suitable near residential areas such as for running, cycling and walking.

3.6.8 Facilitate a seamless boundary with Gundungurra Reserve through joint trails and new picnic areas that traverse the park boundaries such as near the large dam within William Howe Regional Park. Planned linkages to Gundungurra Reserve should follow the intent of the Gundungurra Reserve Plan of Management.

3.6.9 Consider removing fencing between Gundungurra Reserve (North) and the Park once appropriate boundary fencing has been installed around the northern, western and southern sides of Gundungurra Reserve that prevent trail bike access.

3.6.10 Allow public vehicle access to the car park off Mary Howe Place as required. Review the use and role of the car park in consultation with local residents, Camden Council and the Crime Prevention Officer in the planning process for the site facilities plan. Devise alternative uses if necessary that assist in managing anti social behaviour in the Park such as a children's cycling safety skills area with shade shelters and picnic tables.

3.6.11 Continue to permit on-leash dog walking and control such activities where it may conflict with the protection of natural and cultural values.

3.6.12 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 potential for vandalism (see Section 4.3).

3.6.13 Improve the sense of place by encouraging public art installations that reflect the Park's cultural and natural history if levels of vandalism reduce to a suitable level (see Section 4.3).

3.6.14 Work with land managers along the Narellan and Spring Farm Bush Corridor to prepare a signage strategy that will enhance public recognition of the corridor and promote a unified image amongst the stakeholders.

3.7 Information and Education

William Howe Regional Park is not well known within south-west Sydney due partly to a lack of information available to the public on the Park and its values. The Narellan and Spring Farm Bush Corridor is also unknown by the public as it is in its formative stage during the land release process. Camden Council, NPWS and the Australian Botanic Garden Mount Annan aim to create community liaison programs over time to improve recognition and use of the corridor and its natural, cultural and recreation values.

The Park's location within proximity to a number of schools places it in a position to be utilised for educational purposes. Although it is already utilised by local schools particularly for cross-country sports, there is potential to increase its usage as an educational resource for environmental and physical education.

Landcom's Garden Gates and Spring Farm's community development programs may be able to assist in the promotion and delivery of educational programs aimed at encouraging the local community to use and care for the Park. A Bushcare group has been recently formed for William Howe Regional Park with the assistance of Landcom's community development program. Continued support for the group will need to be provided in order to sustain their interest. A 'Friends of William Howe Regional Park and Gundungurra Reserve' or a 'Friends of the Narellan and Spring Farm Bush Corridor' could also be created to serve as an advisory body and community interface in the future.

Issues:

- The Park currently has low visitation due partly to the lack of public awareness of its existence. There is a lack of identification signage in the local area and a lack of information about the Park within the public realm. Furthermore, the NPWS website has little information on the Park, its access points, linkages or facilities.
- Due to past and repeated vandalism, no interpretative or directional signage is currently provided in the Park (see Section 4.3).

Desired Outcomes:

- Public appreciation and awareness of the Park's natural, cultural and recreational values is improved through community engagement, promotion, education and interpretation.
- The Park is a useful educational resource for local schools, community organisations and the wider community.

Management Response:

3.7.1 Develop and implement a community engagement strategy and education program in consultation with major stakeholders including Camden Council, the Australian Botanic Garden Mount Annan, local schools and Aboriginal representatives with the aim of increasing community awareness, usage and stewardship of the Narellan and Spring Farm Bush Corridor. The strategy should include park signage (subject to a reduction in vandalism) and promotion through a range of media and special events.

3.7.2 Promote the Park to the community of south-west Sydney as a destination and thoroughfare for regional cycling and walking as well as for recreation, sport, community activities and education.

3.7.3 Update information regarding William Howe Regional Park on the NPWS website to include linkages to the existing and planned regional cycleway and walking trail network and promote the Park as a destination and thoroughfare as part of the Narellan and Spring Farm Bush Corridor.

3.7.4 Collaborate with stakeholders along the Narellan and Spring Farm Bush Corridor in seeking funding opportunities for community engagement, education and creation of new recreation facilities and infrastructure.

3.7.5 Support the Park's bushcare group and any 'friends of' groups that form to promote community engagement and Park stewardship in cooperation with stakeholders along the Narellan and Spring Farm Bush Corridor.

4.0 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* (MSWRPMS) prioritises specific pest management programs in alignment with State and local priorities, legislation and the NSW Invasive Species Plan (OEH 2011c). Pest management priorities for William Howe Regional Park will be directed by this strategy and will be updated as new information and priorities emerge.

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)* and fox (*Vulpes vulpes*) (OEH 2011c). Domesticated dogs (*Canis familiaris*) are permitted in the Park but must be leashed and under control at all times. Although not currently a significant problem in the Park, predators such as these have the ability to severely affect populations of native animals.

Foxes are noted in the Draft MSWRPMS as being widespread in the Park (OEH 2011c). This species has been linked to regional declines and extinctions of a broad suite of medium-sized non-flying mammals, ground-nesting birds and freshwater turtles. It has also been implicated in the spread of a number of weed species such as Blackberry (*Rubus fruticosus* agg.*)* and Bitou Bush/Bone Seed *(Chrysanthemoides monilifera rotunda)* (OEH 2011c). The

Scientific Committee has made a final determination to list *predation by the European red fox* as a key threatening process (KTP) in Schedule 3 of the TSC Act. *Predation by the European red fox* is also listed as a KTP under the Commonwealth *Environment Protection and biodiversity Conservation Act 1999*.

Other introduced species in the Park include scattered populations of European Bee (*Apis mellifera*), widespread populations of Indian Myna (*Acridotheres tristis*) and fluctuating populations of rabbit (*Oryctolagus cuniculus*) (OEH 2011c). These species are able to affect native species via competition for food, shelter and other resources.

Rabbits are also known to alter the structure and composition of vegetation and cause land degradation (OEH 2011c). At the time of writing this Plan, the rabbit population within the Park was at low densities with little biological impact. If any future hazard reduction burns or wildfires occur, rabbit numbers and regeneration should be monitored post-fire to ensure adequate regeneration of native seedlings particularly in the remnant Cumberland Plain Woodland.

The brown hare (*Lepus capensis*), the red-whiskered Bulbul (*Pycnonotus jocosus*), the spotted dove (*Spilopelia chinensis*) and the common starling (*Sturnus vulgaris*) are other introduced species known to exist in the Park (Leary 2007).

To maximise effectiveness, feral animal control should be undertaken in cooperation with Camden Council in relation to the adjoining Council owned reserves including Mary Howe Reserve and Gundungurra Reserve as proposed in the Gundungurra Reserve Plan of Management.

Weeds

The Park is particularly susceptible to weed infestation due to previous agricultural uses, soil disturbance and infrastructure works over time. As the surrounding area becomes more urbanised, garden escapes from adjoining residential areas, illegal rubbish dumping and wind and bird dispersal will increase the variety of weeds in the Park. The Park is elevated above the surrounding urban area and does not suffer from weeds brought in by stormwater nor higher nutrient content along drainage lines.

In the Draft MSWRPMS (OEH 2011c) 20 significant weed species have been identified as occurring in the Park (see Table 5 below). Although other weed species exist within in the Park (see Table 6), the species listed in Table 5 are considered the most significant in terms of their threat to natural and cultural values in the Park.

Table 3: Significant weeds recorded in William Howe Regional Park in the Draft *Metropolitan South West Regional Pest Management Strategy* [4]

Common name	Scientific name	Comment
Targeted Noxious/ Environmental Weeds		
Trees / Shrubs		
African Olive[p]	*Olea europaea ssp. Cuspidate*	Established widespread infestation throughout Park
Privet (Broad leaf)[# p]	*Ligustrum lucidum*	Established widespread infestation throughout Park

[4] Sourced from Pest Distribution Tables in the *Draft Metropolitan South West Regional Pest Management Strategy Part B* (OEH 2011c)

African Boxthorn[#*]	*Lycium ferocissimum*	Scattered infestation throughout the Park
Green Cestrum[#]	*Cestrum parqui*	Isolated infestation restricted to a small geographic area of the Park
Bitou/Bone Seed[#*p]	*Chrysanthemoides monilifera subspecies monilifera*	Isolated infestation restricted to a small geographic area of the Park
Box Elder	*Acer negundo*	Isolated infestation restricted to a small geographic area of the Park
Camphor Laurel	*Cinnamomum camphora*	Isolated infestation restricted to a small geographic area of the Park
Cassia	*Senna pendula* var. *glabrata*	Isolated infestation restricted to a small geographic area of the Park
Water Weed		
Ludwigia [#p]	*Ludwigia longifolia*	Established widespread infestation
Succulents		
Prickly Pear[#*]	*Opuntia* spp.	Isolated infestation restricted to a small geographic area of the Park
Mother of Millions[p]	*Bryophyllum species*	Isolated infestation restricted to a small geographic area of the Park
Ground Cover		
Mist Flower	*Ageratina riparia*	Scattered infestation throughout the Park
Pattersons Curse [#]	*Echium plantagineum*	Established widespread infestation throughout Park
Exotic Perennial Grasses [p] **-** Established widespread infestation throughout Park		
Pampas Grass[#]	*Cortaderia* spp.	Scattered infestation throughout the Park
Exotic Vines and Scramblers[p] **-** Isolated infestation restricted to a small geographic area of the Park		
Asparagus Fern[p]	*Asparagus aethiopicus*	Isolated infestation restricted to a small geographic area of the Park
Wild Cotton	*Gomphocarpus fruticosus*	Scattered infestation throughout the Park

* Declared Weed of National Significance
[#] Declared 'noxious' under the *Noxious Weed Act 1993* for Camden Local Government Area
[p] Critical priority in the regional pest programs due to impacts on threatened species conservation (OEH 2011c)

Table 6 lists additional weeds that are known to exist within the Park and that are likely to impact on biodiversity.

Table 4: Additional Weeds in William Howe Regional Park

African Lovegrass	*Eragrostis curvula*	Scattered infestation throughout the Park
Couch	*Cynodon dactylon*	Isolated infestation restricted to a small geographic area of the Park.
Kikuyu	*Pennisetum clandestinum*	Scattered infestation throughout the Park
Rhodes Grass	*Chloris gayana*	Scattered infestation throughout the Park
Bridal Creeper*#	*Asparagus asparagoides*	Scattered infestation throughout the Park
Moth Vine	*Araujia sericifera*	Scattered infestation throughout the Park
Trad	*Tradescantia fluminensis*	Scattered infestation throughout the Park
St John's Wort#	*Hypericum perforatum*	Established widespread infestation throughout Park
Blackberry*#p	*Rubus fruticosus* agg.	Scattered infestation throughout the Park

* Declared Weed of National Significance
# Declared 'noxious' under the *Noxious Weed Act 1993* for Camden Local Government Area
p Critical priority in the regional pest programs due to impacts on threatened species conservation (OEH 2011c)
Source: DECCW 2008, Environmental Partnership 2004/09 and DPI NSW 2011

Woody weed invasion, in particular the growth of African olive and African boxthorn are threatening the scenic and landscape values of the Park (see sections 3.1, 3.4 and 3.5). These species also pose a notable threat to the re-establishment of the natural vegetation structure. African boxthorn was planted in western Sydney where it was used as a hedge associated with historic buildings or agricultural activities. At William Howe Regional Park, the woody weeds, including African boxthorn and African olive have been established by bird droppings and do not appear to have cultural or heritage significance.

'African olive invading Cumberland Plain Woodland' has been identified as a critical priority for pest management in the Metropolitan South West Region (OEH 2011c). Furthermore, *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). The recovery plan for Cumberland Plain Woodland (target 2.5) includes the need for development and implementation of a coordinated program for African olive removal across all land tenures (NSW Scientific Committee 2010b). Control programs can include use of the African Olive Management Plan for the Sydney Region as a guide (DECCW 2008 and Sydney Weeds Committees 2008).

Blackberry, a Weed of National Significance, 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 Committee 2010a). It has also been identified in the Draft MSWRPMS as a critical priority in the regional pest programs due to impacts on threatened species conservation (OEH 2011c).

Invasion of Native Plant Communities by Exotic Perennial Grasses has been listed as a Key Threatening Process (KTP) under the *TSC Act* and is an identified threat to Cumberland Plain Woodland. Like blackberry, exotic perennial grasses have also been identified in the Draft MSWRPMS as a critical priority in the regional pest programs due to impacts on threatened species conservation (OEH 2011c). Although herbaceous weeds are present in the park, from a landscape and environmental management perspective, they do not constitute a significant weed management problem at this stage.

Invasion and Establishment of Exotic Vines and Scramblers has been listed as a KTP under the TSC Act and is a critical priority in the regional pest programs due to impacts on threatened species conservation (OEH 2011c). Species particularly impacted by vines and scramblers include the endangered Cumberland Plain Snail (*Meridolum corneovirens*) as well as threatened owl, bird and bat species through loss of hollows. Bridal creeper (*Asparagus asparagoides)* and moth vine (*Araujia sericifera)* are target species in the cross-tenure *Sydney-wide Vines and Scramblers Management Plan 2010-2015* (Sydney Weeds Committees 2010a). Moth vine (*Araujia sericifera)* is particularly well established in the Park and requires targeted management in accordance with best practice control methods (see Table 6).

The absence of substantial levels of native shrubs on the site has resulted in the combination of indigenous and exotic weeds providing fauna habitat for native bird species. The loss of bird habitat needs to be minimised when planning for the progressive removal of woody weed species and restoration with local native species.

A state-wide assessment of biodiversity priorities for the management of widespread weeds has been completed on a catchment by catchment basis (DPI & OEH 2011c) The priorities established by the widespread weeds project are one of the sources used by the Draft MSWRPMS to define priorities for pest management in William Howe Regional Park.

The dams within Gundungurra Reserve are populated by Typha plants that have the potential to smother the surface of the dams. (Camden Council 2005a) This species may spread to water bodies within William Howe Regional Park, detrimentally impacting aquatic habitats.

In the *Gundungurra Reserve Plan of Management* it is recommended that Camden Council and NPWS mange weeds collaboratively across the adjoining reserves.

Pathogens and Diseases

Although no pathogens or plant diseases have been detected within the Park, there is likelihood that serious pathogens and diseases could exist, as they are present in other reserves in the Sydney basin. Myrtle rust is a plant disease caused by the exotic fungus *Uredo rangelii* and was first detected in Australia in 2010. *Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae* is listed as a Key Threatening Processes under the TSC Act. It is likely to spread rapidly to the extent of its biological range as the spores are readily dispersed by wind. Eradication is unfeasible. The likely impacts of myrtle rust on biodiversity in Australia are unknown however it may contribute to the decline and extinction of species and may severely impact the structure and function of natural ecosystems. The *Management Plan for Myrtle Rust on National Parks* outlines how the disease will be managed on national park estate in NSW (OEH 2011c).

Phytophthora cinnamoni is a plant pathogen that was probably introduced in Australia before 1900. It is present in reserves in the Sydney basin. *Phytophthora cinnamoni* is listed as a key threatening process under both State and Federal legislation resulting in a national threat abatement plan and a Statement of Intent for NSW. Only laboratory analysis of soil from the Park can determine if the pathogen is present. It is a microscopic soil borne organism that causes root rot in a wide range of plant species. Infection often results in plant death. Spores can be dispersed by surface and subsurface water flows and by humans through the movement of contaminated soil, water or plant material (OEH 2011c).

Desired Outcomes:

- Negative impacts of pest, pathogens, disease 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 from the Park.
- Manage pests and weeds in a strategic and collaborative way with adjoining land managers within the Narellan and Spring Farm Bush Corridor.

Management Response:

4.1.1 Prioritise pest species control in accordance with the Draft Metropolitan South West Regional Pest Management Strategy and in consideration of neighbouring landowners and key stakeholder priorities.

4.1.2 Monitor the Park to determine the presence and extent of weed and animal pest species and update the Metropolitan South West Regional Pest Management Strategy accordingly to reflect new information. In the monitoring process also identify biodiversity or other values at risk.

4.1.3 Source funds in collaboration with Camden Council and other land managers along the Narellan and Spring Farm Bush Corridor to control animal pests and weeds across the landscape and to undertake restoration works.

4.1.4 After future hazard reduction burns or wildfires occur, monitor rabbit numbers and regeneration post-fire to ensure adequate regeneration of seedlings in the remnant Cumberland Plain Woodland and prevent excessive grazing.

4.1.5 If identified on Park, manage pathogens according to best practice guidelines.

4.1.6 Monitor park dams for the presence of Typha plants and manage any infestations according to best practice guidelines.

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. *High frequency fire resulting in the disruption of life cycle*

processes in plants and animals and loss of vegetation structure and composition is listed as a key threatening process under the TSC Act.

The fire history in what is now the Park is not well documented however it has not been subject to frequent fire. Apart from two small grass fires in the north-western section of the Park in 2001-2002, no other bush fire incidents have been recorded, with the exception of small arson fires at the lookout that have not spread into bushfires (see Section 4.3) (DEC 2006c).

A Type 1 Fire Management Strategy (NPWS 2006) exists for the Park that is due to be renewed in accordance with the *NPWS Fire Management Manual* (DECCW 2010b). In the Strategy, the Park is identified as having a medium to low-level fire risk (DEC 2006c) and the Park is predominately zoned as a Land Management Zone for fire management planning purposes. The exception is a 5 to 10 metre strip adjacent to the power-line easement and existing roads / trails which are maintained as Strategic Fire Advantage Zones. The primary fire management objectives of the Land Management Zone are to prevent the loss of remnant plant and native animal species and to protect culturally significant sites. The primary fire management objectives of the Strategic Fire Advantage Zone are to reduce fire intensity and spotting distance, reduce the probability of bushfires being ignited, complement Asset Protection Zones (of which there are none in this Park), strengthen existing fire control advantages and restrict the movement of fires between fire management zones and to or from the Park (DEC 2006c).

Built assets subject to the effects of fire within the Park are limited to picnic tables, signage, fencing and the power line easement that runs through the Park. Endeavour Energy is responsible for vegetation control to assist fire management within the power line easement. Natural assets vulnerable to inappropriate fire regimes include habitat for threatened flora and fauna species and the small area of remnant disturbed Cumberland Plain Woodland critically endangered ecological community. Vulnerable assets adjacent to the Park include residential dwellings particularly those adjoining the Park to the north and east, the Sydney Water reservoir near the centre of the Park and the Macarthur Resource Recovery Park to the south-east. Extreme fire conditions may pose a threat to the built assets of other neighbouring landowners within the surrounding urban areas.

The pedestrian/cycle path that beings and ends at the car park off Mary Howe Place via the lookout also functions as a fire trail that can accommodate all categories of fire fighting appliances (up to category 1). The loop allows fire-fighting vehicles to travel in either direction as required. Other trails within the Park also provide access for fire fighting appliances and vehicles can access most grassy areas within the Park.

NPWS maintains cooperative arrangements with surrounding landowners and the Rural Fire Service (RFS) 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.

The formation of a fire management plan for the bushland corridor that includes Gundungurra Reserve, William Howe Regional Park, the Narellan and Spring Farm Bush Corridor and the Macarthur Resource Recovery Park odour buffer is indicated as a high priority in the *Gundungurra Reserve Plan of Management* (Environmental Partnership 2004).

Asset protection zones are regularly maintained around the perimeter of the Park and comprise mown grass areas.

Desired Outcomes:

- Negative 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.

Management Response:

4.2.1 Prepare and implement a new map-based Fire Management Strategy for the Park (Type 2 Format) that takes into consideration any fire management plan for the Narellan and Spring Farm Bush Corridor. The *Macarthur Bushfire Risk Management Plan* 2012 and Camden Council's *Bushfire Prone Lands Map 4* (Camden Council 2009) should also be considered in the preparation of the Strategy.

4.2.2 Develop and implement an annual program of bush fire hazard reduction works.

4.2.3 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.

4.2.4 Install trail identification signs for fire management at appropriate locations consistent with the NSW Bushfire Management Coordinating Committee's *Fire Trail Policy* and NPWS *Park Signage Manual*.

4.2.5 Monitor the ability of flora to recover between fires and review regimes where relevant.

4.2.6 Rehabilitate areas disturbed by fire suppression operations including temporary track control lines as soon as practical after the fire.

4.2.7 Liaise with Landcom to ensue that an appropriate Park edge interface is created as well as adequate fire buffers for any new residential development abutting the Park boundary in the Mt Annan Urban Release Area.

4.3 Illegal Activity

Illegal activity has become a serious problem in the Park partly due to the lack of visibility of much of the Park from nearby residential areas, limited surveillance and the increasing population from surrounding urbanisation. Multiple access and exit points for the Park, including from cul de sacs and adjoining Council pocket parks exacerbate the problem.

Illegal activity includes arson, graffiti, vegetation removal, wood collecting, attacks on park furniture and signage, illegal trail bike riding and illegal dumping of general rubbish, vegetation and construction material. Illegal activity is more frequent at night after 9pm, on weekends and during school holidays and the resultant damage has been an ongoing reactive maintenance issue for Park staff for many years.

Illegal trail bikes are damaging vegetation on trails as well as trail surfaces, are dangerous to walkers and create excessive noise. Trail bike riding is also prohibited in Gundungurra Reserve. Despite barrier controls between Gundungurra Reserve and the Park, bikes enter the Park via the reserve.

Vandalism occurs regularly at Turkeys Nest Lookout as it provides a secluded meeting place with multiple escape routes. Minor acts of vandalism such as small fires at the lookout structure, wood collection, graffiti and attacks on park furniture and signage occur regularly.

In 2007 the low wall that forms the lookout structure was completely demolished by vandals and was rebuilt in 2009. Furthermore, the design of the seating in a circular formation with a hard surface, invites the creation of a bon fire in the middle.

Regular vandalism limits the potential to provide signage and visitor facilities on Park as they are soon damaged once erected. Two of the three picnic tables at the lookout have now been destroyed. Similarly no interpretative signage has been installed at the lookout as previous signs have been vandalised. Interpretative signage could be installed at the entrances to the Park in more visible areas, or off Park in a local community centre where people can access the information in an area less likely to be exposed to vandalism.

The car park off Mary Howe Place has been used in the past for burnouts and other dangerous driving behaviour and has had to be locked except when there are official activities within the Park. All gates into the Park are locked at all times preventing unauthorised vehicles from entering.

The Camden Local Area Commander has been asked by NPWS to assist and conduct night-time patrols to help prevent ongoing anti-social behaviour and further vandalism. The Police have been allocated a key to the gate at the car park and undertake surveillance on weekends, when resources permit or when there has been a report of illegal activity within the Park (Millman 2012). Visitors to the Park and the local community are encouraged to report illegal activity to NPWS, the Local Area Command and Camden Council.

As most offences occur after 9pm, there is an option to trial a closure of the Park between sunset and sunrise (in accordance with s.4(1)(b) of the *NPW Regulation 2009)* to assist in the management of illegal activity. The needs of local walkers before 9pm and after 5am will need to be considered before any temporary closure of the Park proceeds. Signage, providing notification of the closure, will be erected at the Park entrances and regularly monitored to ensure it is intact.

Desired Outcomes:

- Reduce the incidence of illegal activity in the Park.
- Provide a safe and enjoyable environment for Park visitors.
- Create and maintain good relations with Park neighbours and encourage them to report illegal activity on Park.

Management Response:

4.3.1 Work with Local Area Command to prepare a Crime Risk Assessment for the Park to inform level of risk and response required such as night-time patrols.

4.3.2 During a period of vandalism, close the Park at night for a trial period to assist Police in responding to illegal activity. Prepare a communications plan and consult the local community prior to enacting the night-time closure. Assess the effectiveness of the trial closure once it has been completed.

4.3.3 Participate with relevant stakeholders in Neighbourhood Watch Programs and other responses organised by local authorities and encourage neighbours and the public to report incidents.

4.3.4 Continue to implement management actions to exclude trail bikes and other unauthorised vehicles from entering the Park including barriers. Collaborate with Camden Council to prevent trail bikes entering the Park through Gundungurra Reserve.

4.3.5 In partnership with Camden Local Area Command, install surveillance cameras to establish patterns and regularity of use when required.

4.3.6 Consider erecting interpretation signs in highly visible areas along the Park boundary or off Park in community spaces where they are less likely to be exposed to vandalism. Once cases of vandalism reduce, consider installing signage in the Park, particularly at Turkeys Nest Lookout.

4.3.7 Devise and implement strategies to minimise rubbish dumping through community education, signage, surveillance, law enforcement and appropriate fencing.

4.3.8 Remove and dispose of introduced rubbish as soon as possible.

4.3.9 Maintain a presence in the Park during peak visitation periods by way of Ranger patrols to deter undesirable behaviour in the Park.

4.4 Climate Change

Anthropogenic climate change has been listed as a key threatening process under the TSC Act and EPBC Act. Projections of changes to the climate of Sydney to the year 2050 include a hotter climate, more frequent and intense bushfires and more rain in spring and summer (DECCW 2010d). 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 and result in an extension of the bushfire season. 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. In summer, major increases in runoff are likely to impact on the stormwater system and where capacity is reached, cause flooding. Higher rainfalls are likely to accelerate all forms of soil erosion across the region (DECCW 2010d).

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. Highly cleared and fragmented ecosystems such as those on the Cumberland Plain are likely to be at greater risk than more intact ecosystems.

OEH, including NPWS, has made a commitment to environmental sustainability under the *DECCW Sustainability Action Plan 2010* (DECCW 2010e) and the *Protected Areas Climate Change Statement and Action Plan* (NPWS 2008a). 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 impacts of climate change on natural systems are minimised.

Management Response:

4.4.1 Continue existing fire, pest, and weed management and bushland restoration programs and adapt where required to minimise climate change induced threats;

4.4.2 Work with other land managers, particularly Camden Council and the community to improve habitat resilience against climate change through cross-boundary efforts including the creation of buffers and corridors for fauna movement as well as managing threats within the Park and adjoining areas as they arise; and

4.4.3 Align Park management with the intent of relevant climate change strategies

5.0 Management Operations and Other Uses

5.1 Management facilities and operations

The Park has one major management trail that provides vehicle access for reserve management. It forms a loop beginning at the car park at Mary Howe Place up to the lookout at Turkeys Nest Dam and back to the main Park entrance. At the most western point, it connects with Gundungurra Reserve. Public vehicle access within the Park is prohibited.

The most southern portion of the loop trail circulates through land owned by Sydney Water. Sydney Water have requested that OEH enters into a lease or licence agreement for use, management and maintenance of the portion of the loop trail within its estate.

The informal trail from the most southern portion of the loop trail within Sydney Water property towards the water tank is to be closed by Sydney Water. Use of this trail should be discouraged by NPWS from within the Park and from the loop trail as Sydney Water does not encourage walking tracks through its estate.

Desired Outcomes:

- Park infrastructure is routinely maintained and managed to benefit a wide range of park users.
- OEH enters into a lease or licence agreement with Sydney Water in order for the loop trail to pass through Sydney Water property.
- Management facilities and operations adequately serve management needs and have minimal impact.

Management Response:

5.1.1 Develop a management agreement with Sydney Water for the portion of the Park's loop trail that circulates through Sydney Water estate.

5.1.2 Close the informal trail that circulates from the most southern portion of the loop trail within Sydney Water property towards the water tank.

5.2 Non-NPWS uses/operations

Easements

There are a number of easements within William Howe Regional Park that cover public utilities managed by state and regional authorities and provide access to manage, maintain, repair and carry out works on the various infrastructure. The public utilities include transmission lines, water supply works, gas pipelines and electricity supply.

An easement has been granted to Sydney Water to access, construct and maintain an underground water main connecting the water reservoir with the Spring Farm Release Area via a 163 metre long trench. In the Review of Environmental Factors (NPWS 2008b) for the project, key objectives included provision of drinking water to the recreational users of the Park and provision of additional access to water for bushfire fighting purposes. Although provision of these facilities was not included as a condition of approval, the possibility still exists for Sydney Water to install these facilities in the future should the need arise. Another easement circulates between the Sydney Water reservoir and Mary Howe Reserve and a small easement crosses the Park from the south-eastern corner of the Sydney Water land to Moyengully Avenue for access and water supply. 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 400 metre long subterranean easement was created in 2009 for AGL Energy Limited to access the Park for the construction of an underground pipeline by directional drill for the AGL Camden Gas Project. Currently one well is located in Gundungurra Reserve and another off park near the south-western dam where a car park may be built in the future to service William Howe Regional Park and Gundungurra Reserve (North). According to AGL, there are no further plans to establish any additional sites near the Park (AGL 2011).

An easement for transmission lines traverses the northern portion of the Park from the south-western dam to the north-eastern corner near Iron Ridge Reserve, permitting Endeavour Energy access to all structures and for maintenance of adequate safety clearances. A narrow easement has also been created for access purposes across the narrow south-eastern strip of the Park in a north-south direction.

As the Park is located within a rapidly urbanising region of Sydney, there is external pressure for infrastructure such as water, gas, electricity and telecommunications to traverse the Park in order to create the required network of services. The long-term aim however is to reduce the number of utility or non-park uses within the Park where possible. Due to the narrow configuration of sections of the Park and its small size, any further utility developments will potentially significantly impact on the values of the Park. Any infrastructure development that impacts on the lookout, the view corridors and the associated Aboriginal and historic cultural values and recreational values (see section 3.0 of this Plan) is considered inappropriate.

Adjoining Land

Narellan and Spring Farm Bush Corridor

In 2012, stakeholders along the Narellan and Spring Farm Bush Corridor began to work collaboratively in addressing issues of common interest and to promote integrated and sustainable planning. Stakeholders include the NPWS, Camden Council, Sydney Water, the Australian Botanic Garden Mount Annan and the Tharawal LALC. The stakeholders have agreed to work towards providing an open space corridor that meets the recreation needs of the growing population whilst conserving natural and cultural values. Conservation outcomes are to be optimised by integrating where practicable, pest and weed management planning, revegetation, fire management and habitat restoration across respective tenures, creating potential for native fauna movement. The stakeholders will also work together to seek funding opportunities, engage with the community and investigate opportunities for research and monitoring partnerships with selected institutions. Synergies will be formed particularly with Camden Council in relation to the adjoining Gundungurra Reserve as the Reserve and the Park have similar management objectives and management challenges.

Sydney Water

The adjoining Sydney Water reservoir is very visible from the elevated central and southern areas of the Park. Sydney Water proposes to erect another reservoir on the site in future years which will have further visual impacts on the amenity of the Park. Any future vegetative screening of the reservoir(s) will need to be conducted following close consultation with Sydney Water and in consideration of risk of fire damage to essential infrastructure that provides water for the Camden Local Government Area. Refer to section 5.1 in relation to the Park trail system that circulates through Sydney Water estate.

Adjoining Urban Release Areas

Moyengully Avenue and Dodonea Circuit on the eastern boundary of the Park separate most of the adjoining Mount Annan urban release area from the Park boundary. Approximately 600 metres of the reserve boundary adjoins residential development along the north eastern side. Periodically residents request access from their properties to the Park and some informal access points already exist.

A small patch of land near the most southern gate to the Park within the South Mount Annan urban release area, has been identified for future residential development. If it is developed, new houses may be constructed on the Park boundary. Negotiations are required between NPWS and Landcom to ensure that an appropriate park edge interface is created and that adequate fire buffers are included in any future development in accordance with legal requirements.

Macarthur Resource Recovery Park

Macarthur Resource Recovery Park is not visible from the Park due to vegetation and topography. An odour buffer exists between the Park and the waste centre, and odour can be offensive to Park visitors depending on wind direction.

Desired outcomes:

- There is cooperative land management of publicly owned land along the Narellan and Spring Farm Bush Corridor.
- Cooperatively manage the western boundary of the Park with Camden Council to enable a ‘seamless’ boundary between the Park and Gundungurra Reserve and Mary Howe Reserve to improve visitor experience and land management outcomes.
- Service utility uses and activities are maintained in accordance with agreement/consent conditions and are managed to minimise impacts on park values and Park infrastructure.
- Utility infrastructure unrelated to park operation is reduced over time where possible.
- Boundary impacts from residential development abutting the Park are managed through negotiation and effective planning.

Management response:

5.2.1 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.

5.2.2 Investigate whether Sydney Water can provide drinking water and water for fire fighting purposes on Park from existing water pipelines that circulate across the Park.

5.2.3 Cooperatively manage the Park as part of the Narellan and Spring Farm Bush Corridor to encourage continuity in weed and pest management, revegetation, fire management, recreation infrastructure provision and maintenance, standard signage and connectivity for park visitors in terms of linking pathways and cycleways where suitable.

5.2.4 Liaise with the Macarthur Resource Recovery Park in relation to maintenance of the odour buffer and an appropriate Park interface and buffer.

6.0 Implementation

This plan of management establishes a scheme of operations for William Howe 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 7. 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 5: List of Management Responses

Action No.	Management response	Priority*
	6.1 On-Park Ecological Conservation – Plan ref. 3.1, 3.2, 3.3, 4.4	
3.1.1	Design and undertake all works in a manner which minimises soil erosion and appropriately treat areas of erosion if they arise.	O
3.1.2	Conduct activities in a manner that ensures catchment values and water quality are protected and maintained. Engage with other authorities as needed to address issues that affect catchment values and water quality within the Park.	L
3.1.3	Undertake a risk assessment of the farm dams and determine the appropriate management approach that may include removal of dam wall structures.	H
3.1.4	Prohibit developments in the Park that negatively impact on the skyline.	H
3.1.5	Seek necessary approvals from the Mine Subsidence Board, Picton when undertaking relevant development on Park.	H
3.1.6	Engage with relevant authorities as needed to address potential impacts of gas extraction works on Park values.	H
3.2.1	Prepare and implement a landscape master plan for the Park in consultation with stakeholders that encourages the creation of vegetation linkages of locally occurring native species; protects cultural landscapes and identified view corridors; complies with best management practice for ecological restoration of native plant communities (e.g. DEC 2005a|); and improves the natural value of the woodland area in terms of structure, plant composition and area of vegetation coverage. Consideration should also be given to the staged removal of planted over-storey species which are not endemic to the local area and	H

	which have potential to outcompete locally endemic species. Additionally, consideration should be given to improving the habitat quality of the dams, fire buffer and public safety requirements, access and the need to retain open recreation areas, cultural landscapes and view corridors.	
3.2.4	Where appropriate, work with the other land managers within the Narellan and Spring Farm Bushland Corridor, as well as other neighbours, community groups and Aboriginal groups and organisations to undertake strategic weeding, bush regeneration, planting and monitoring which facilitates coordinated land management, optimises conservation outcomes and increases community awareness and shared ownership.	H
3.2.5	Experiment with alternative restoration techniques to maximise the possibility of successfully restoring native vegetation, including ecological burns.	H
3.2.6	Reduce mown areas where appropriate and increase the height of the mown areas where a high native species component exists. Rest mown areas periodically to allow native grass seed to set and establish.	H
3.2.7 3.3.8	Investigate opportunities for research and monitoring partnerships with selected institutions.	L
3.3.2	Manage weeds within the Park in a staged approach that is sensitive to the habitat requirements of native fauna.	O
3.3.3	Work collaboratively with other land managers within the Narellan and Spring Farm Bush Corridor to improve habitat corridor linkages.	H
3.3.4	Where possible in conjunction with Camden Council, formulate a monitoring and evaluation program to periodically assess changes in fauna populations and to better understand the habitat values and management requirements of the Park and Gundungurra Reserve.	L
3.3.5	Develop and implement protocols for mowing and weed management to protect habitat requirements of native fauna.	M
3.3.6	Work collaboratively with Camden Council to promote responsible pet ownership and management through signage and education programs.	M
3.3.7	Liaise with Camden Council, the Roads and Maritime Services and the Department of Planning and Infrastructure to include provisions for the movement of terrestrial fauna in the final design of Liz Kernohan Drive through traffic calming devices and the creation of passageways as well as ongoing monitoring.	H
3.3.9	Ensure that the landscape master plan for the Park considers options for the improvement of fauna habitat quality through such means as the provision of artificial tree hollows, augmentation of coarse woody debris (addition of logs), sympathetic planting on the fringes of dams for waterbirds and augmentation of muddy bank edges etc.	H
3.5.5	Continue to manage Turkeys Nest dam as a small wetland environment, maintained by rainfall and the natural aquifer.	O
4.4.1	Continue existing fire, pest, and weed management and bushland restoration programs and adapt where required to minimise climate change induced	O

	threats;	
4.4.2	Work with other land managers, particularly Camden Council and the community to improve habitat resilience against climate change through cross-boundary efforts including the creation of buffers and corridors for fauna movement as well as managing threats within the Park and adjoining areas as they arise;	O
4.4.3	Align Park management with the intent of relevant climate change strategies	O
	6.2 Threatened Species – Plan ref. 3.2, 3.3	
3.2.2	Undertake targeted surveys for threatened plant species likely to occur in the Park.	H
3.3.1	Implement relevant strategies in the PAS and recovery plans and utilise best practice guidelines for threatened fauna species present in the Park.	H
3.2.3	Implement relevant strategies in the PAS, recovery plans and best practice guidelines for threatened species and ecological communities present in the Park.	O
	6.3 Aboriginal Cultural Heritage – Plan ref. 3.4	
3.4.1	Continue to consult and involve the Tharawal LALC, the Cubbitch Barta Native Title Claimant Aboriginal Corporation and other interested Aboriginal community groups in the management of the Park, including the management and interpretation of Aboriginal sites and places as well as natural values.	O
3.4.2	Undertake an archaeological survey and cultural assessment in consultation with the Aboriginal community prior to all works with the potential to impact on Aboriginal sites or values.	H
3.4.3	Should Aboriginal relics be found within the Park, investigate and record them on the OEH Aboriginal Heritage Information Management System (AHIMS) database.	H
3.4.4	In partnership with Aboriginal and land management stakeholders, encourage a coordinated approach to the interpretation of Aboriginal culture and heritage along the Narellan and Spring Farm Bush Corridor.	H
	6.4 Historic Heritage – Plan ref. 3.5	
3.5.1	Record historic sites and include items on the OEH Historic Heritage Information Management System (HHIMS) register. Investigate the opportunity to undertake archaeological research particularly on Turkeys Nest dam, the agricultural berms and old tracks.	H
3.5.2	Undertake an archaeological survey and cultural assessment prior to works with the potential to impact on historic sites and places.	H
3.5.3	Protect and manage historic heritage features and values according to their significance.	O
3.5.4	Liaise with land managers along the Narellan and Spring Farm Bush Corridor to manage historic heritage collaboratively and strategically to retain the colonial	H

	cultural landscape and view corridors identified in Camden DCP 2011	
	6.5 Visitor Services – Plan ref. 3.6	
3.6.6	Consider the use of commercial vendors for community and recreation services that are complementary to maintaining the Park's natural and cultural values, that comply with the NPW Act and Regulations and that increase use of the Park.	L
3.6.7	Encourage utilisation of the Park for community and sporting events that are suitable near residential areas such as for running, cycling and walking.	O
3.6.11	Continue to permit on-leash dog walking and control such activities where it may conflict with the protection of natural and cultural values.	O
	6.6 Visitor Infrastructure – Plan ref. 3.6	
3.1.7	Prepare and implement a View Management Plan to maintain important view corridors from vantage points within the Park.	L
3.6.1	Work with land managers along the Narellan and Spring Farm Bush Corridor to prepare a recreational needs analysis and corridor precinct plan that will inform a site facilities plan for the Park. In the meantime, manage the Park principally as a day use area.	H
3.6.2	Improve access to the Park by providing a major access point and new shared car park (with Gundungurra Reserve) off the proposed Liz Kernohan Drive to the south-west of the Park (in consultation with Camden Council).	H
3.6.3	Facilitate integration of the Park with Council's plans for regional cycle and pedestrian routes.	H
3.6.4	Review connectivity of tracks and trails on Park and develop a prioritised program for their hardening or closing and the creation of new trails based on connectivity, importance, impacts on natural and cultural values and whether they were former tracks during the Glenlee Farm period.	H
3.6.5	Actively promote public transport options to the Park in consultation with Camden Council and the Roads and Maritime Services.	L
3.6.8	Facilitate a seamless boundary with Gundungurra Reserve through joint trails and new picnic areas that traverse the park boundaries such as near the large dam within William Howe Regional Park. Planned linkages to Gundungurra Reserve should follow the intent of the Gundungurra Reserve Plan of Management.	H
3.6.9	Consider removing fencing between Gundungurra Reserve (North) and the Park once appropriate boundary fencing has been installed around the northern, western and southern sides of Gundungurra Reserve that prevent trail bike access.	L
3.6.10	Allow public vehicle access to the car park off Mary Howe Place as required. Review the use and role of the car park in consultation with local residents, Camden Council and the Crime Prevention Officer in the planning process for the site facilities plan. Devise alternative uses if necessary that assist in managing anti social behaviour in the Park such as a children's cycling safety skills area with shade shelters and picnic tables.	M
3.6.12	Remove old and damaged park infrastructure/furniture that may cause harm to park visitors. Replacement of damaged infrastructure/furniture will be	H

	determined by level of use and potential for vandalism (see Section 4.3).	
5.1.1	Develop a management agreement with Sydney Water for the portion of the Park's loop trail that circulates through Sydney Water estate.	M
4.3.1	Work with Local Area Command to prepare a Crime Risk Assessment for the Park to inform level of risk and response required such as night-time patrols.	H
3.6.14	Work with land managers along the Narellan and Spring Farm Bush Corridor to prepare a signage strategy that will enhance public recognition of the corridor and promote a unified image amongst the stakeholders.	L
	6.7 Community Programs And Education – Plan ref. 3.7, 4.3	
3.6.13	Improve the sense of place by encouraging public art installations that reflect the Park's cultural and natural history if levels of vandalism reduce to a suitable level (see Section 4.3).	L
3.7.1	Develop and implement a community engagement strategy and education program in consultation with major stakeholders including Camden Council, the Australian Botanic Garden Mount Annan, local schools and Aboriginal representatives with the aim of increasing community awareness, usage and stewardship of the Narellan and Spring Farm Bush Corridor. The strategy should include park signage (subject to a reduction in vandalism) and promotion through a range of media and special events.	M
3.7.2	Promote the Park to the community of south-west Sydney as a destination and thoroughfare for regional cycling and walking as well as for recreation, sport, community activities and education.	O
3.7.3	Update information regarding William Howe Regional Park on the NPWS website to include linkages to the existing and planned regional cycleway and walking trail network and promote the Park as a destination and thoroughfare as part of the Narellan and Spring Farm Bush Corridor.	H
3.7.4	Collaborate with stakeholders along the Narellan and Spring Farm Bush Corridor in seeking funding opportunities for community engagement, education and creation of new recreation facilities and infrastructure.	L
3.7.5	Support the Park's bushcare group and any 'friends of' groups that form to promote community engagement and Park stewardship in cooperation with stakeholders along the Narellan and Spring Farm Bush Corridor.	H
4.3.1	Work with Local Area Command to prepare a Crime Risk Assessment for the Park to inform level of risk and response required such as night-time patrols.	H
4.3.2	During a period of vandalism, close the Park at night for a trial period to assist Police in responding to illegal activity. Prepare a communications plan and consult the local community prior to enacting the night-time closure. Assess the effectiveness of the trial closure once it has been completed.	M
4.3.3	Participate with relevant stakeholders in Neighbourhood Watch Programs and other responses organised by local authorities and encourage neighbours and the public to report incidents.	M
4.3.6	Consider erecting interpretation signs in highly visible areas along the Park boundary or off Park in community spaces where they are less likely to be exposed to vandalism. Once cases of vandalism reduce, consider installing signage in the Park, particularly at Turkeys Nest Lookout.	L

4.3.7	Devise and implement strategies to minimise rubbish dumping through community education, signage, surveillance, law enforcement and appropriate fencing.	L
4.3.9	Maintain a presence in the Park during peak visitation periods by way of Ranger patrols to deter undesirable behaviour in the Park.	H
	6.8 Weeds and 6.9 Pest Animals – Plan ref. 4.1	
4.1.1	Prioritise pest species control in accordance with the Draft Metropolitan South West Regional Pest Management Strategy and in consideration of neighbouring landowners and key stakeholder priorities.	H
4.1.2	Monitor the Park to determine the presence and extent of weed and animal pest species and update the Metropolitan South West Regional Pest Management Strategy accordingly to reflect new information. In the monitoring process also identify biodiversity or other values at risk.	M
4.1.3	Source funds in collaboration with Camden Council and other land managers along the Narellan and Spring Farm Bush Corridor to control animal pests and weeds across the landscape and to undertake restoration works.	M
4.1.4	After future hazard reduction burns or wildfires occur, monitor rabbit numbers and regeneration post-fire to ensure adequate regeneration of seedlings in the remnant Cumberland Plain Woodland and prevent excessive grazing.	H
4.1.5	If identified on Park, manage pathogens according to best practice guidelines.	H
4.1.6	Monitor park dams for the presence of Typha plants and manage any infestations according to best practice guidelines.	H
	6.10 Fire Management – Plan ref. 4.2	
4.2.1	Prepare and implement a new map-based Fire Management Strategy for the Park (Type 2 Format) that takes into consideration any fire management plan for the Narellan and Spring Farm Bush Corridor. The *Macarthur Bushfire Risk Management Plan* 2012 and Camden Council's *Bushfire Prone Lands Map 4* (Camden Council 2009) should also be considered in the preparation of the Strategy.	H
4.2.2	Develop and implement an annual program of bush fire hazard reduction works.	H
4.2.3	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.	O
4.2.4	Install trail identification signs for fire management at appropriate locations consistent with the NSW Bushfire Management Coordinating Committee's *Fire Trail Policy* and NPWS *Park Signage Manual*.	L
4.2.5	Monitor the ability of flora to recover between fires and review regimes where relevant.	L
4.2.6	Rehabilitate areas disturbed by fire suppression operations including temporary track control lines as soon as practical after the fire.	H

4.2.7	Liaise with Landcom to ensue that an appropriate Park edge interface is created as well as adequate fire buffers for any new residential development abutting the Park boundary in the Mt Annan Urban Release Area.	O
	6.11 General Infrastructure And Maintenance – Plan ref. 4.3, 5.1, 5.2	
4.3.4	Continue to implement management actions to exclude trail bikes and other unauthorised vehicles from entering the Park including barriers. Collaborate with Camden Council to prevent trail bikes entering the Park through Gundungurra Reserve.	O
4.3.5	In partnership with Camden Local Area Command, install surveillance cameras to establish patterns and regularity of use when required.	M
4.3.8	Remove and dispose of introduced rubbish as soon as possible.	H
5.1.2	Close the informal trail that circulates from the most southern portion of the loop trail within Sydney Water property towards the water tank.	H
5.2.3	Cooperatively manage the Park as part of the Narellan and Spring Farm Bush Corridor to encourage continuity in weed and pest management, revegetation, fire management, recreation infrastructure provision and maintenance, standard signage and connectivity for park visitors in terms of linking pathways and cycleways where suitable.	H
5.2.4	Liaise with the Macarthur Resource Recovery Park in relation to maintenance of the odour buffer and an appropriate Park interface and buffer.	O
	6.12 Assessments, Acquisition And Establishment – Plan ref. 5.2	
5.2.1	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
5.2.2	Investigate whether Sydney Water can provide drinking water and water for fire fighting purposes on Park from existing water pipelines that circulate across the Park.	L

ACRONYMS

AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
BFMC	Bush Fire Management Committee
DCP	Development Control 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
DPI	Department of Primary Industries (NSW)
DUAP	Department of Urban and Regional Planning
EEC	Endangered Ecological Community
EPA Act	*Environmental Planning and Assessment Act* 1979 (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act* 1999 (Commonwealth)
HHIMS	Historic Heritage Information Management System
KTP	Key Threatening Process
LALC	Local Aboriginal Land Council
MSWRPMS	Metropolitan South West Regional Pest Management Strategy
NPW Act	*National Parks and Wildlife Act* 1974 (NSW)
NPWS	National Parks and Wildlife Service (NSW)
NSW	New South Wales
OEH	Office of Environment and Heritage (NSW)
PAS	Priority Action Statement
RFS	Rural Fire Service
TSC Act	*Threatened Species Conservation Act* 1995 (NSW)

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