



# Plan of Management

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## Prospect Nature Reserve



# **PROSPECT NATURE RESERVE**

## **PLAN OF MANAGEMENT**

**NSW National Park and Wildlife Service**

**November 2012**

**This plan of management was adopted by the Minister for the Environment on 26<sup>th</sup> November 2012.**

### **Acknowledgments**

This plan of management is based on a draft plan prepared by the Sydney Catchment Authority (SCA) and the NSW National Parks and Wildlife Service, part of the Department of Premier and Cabinet.

Valuable information and comments were provided by staff of the Sydney Catchment Authority and members of the former Darug Peoples Advisory Committee.

The National Parks and Wildlife Service and the Sydney Catchment Authority acknowledge that Prospect Nature Reserve forms part of the traditional lands of the Darug people.

FRONT COVER: Prospect Nature Reserve and Reservoir by Lyndal Kaye, NPWS.

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Published by:  
Office of Environment and Heritage NSW  
59–61 Goulburn Street  
PO Box A290  
Sydney South 1232

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ISBN 978 1 74293 946 9

OEH 2012/0968

Printed on recycled paper

## FOREWORD

Prospect Nature Reserve was established on 28 February 2007 and covers 325.3 hectares on the northern shore of Prospect Reservoir in Western Sydney. It is located approximately ten kilometres west of Parramatta and five kilometres south of Blacktown.

Prospect Nature Reserve forms a major part of the catchment area for Prospect Reservoir and is located within a Special Area under the *Sydney Water Catchment Management Act 1998* to protect its role as part of Sydney's water supply.

Prospect Nature Reserve contains one of the largest remaining remnants of the critically endangered Cumberland Plain Woodland community, and therefore has a significant role in the conservation of regional biodiversity for western Sydney. The reserve also has cultural value to the Darug people.

The New South Wales *National Parks and Wildlife Act 1974* requires that a plan of management be prepared for each nature reserve. A draft plan of management for Prospect Nature Reserve was placed on public exhibition from 17 July to 19 October 2009. The submissions received were carefully considered before adopting this plan.

The plan contains a number of actions to achieve the NSW 2021 goal to protect our natural environment, including developing and implementing bushfire and weed management plans, long-term monitoring of flora and fauna, and continued controls to protect water quality. The plan also includes strategies to involve and employ Darug and other Aboriginal people in reserve management.

This plan of management establishes the scheme of operations for Prospect Nature Reserve. In accordance with section 73B of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.



**Robyn Parker MP**  
**Minister for the Environment**

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## **1. INTRODUCTION**

### **1.1 LOCATION, GAZETTAL AND REGIONAL SETTING**

Prospect Nature Reserve is located ten kilometres west of Parramatta and five kilometres south of Blacktown. It is bounded by Reen and Reservoir Roads to the north, Ferrers Road to the west, and Prospect Reservoir to the south. Its total area is 325.3 hectares and it is located within the Blacktown City local government area (LGA). However, it is also close to the boundaries of Holroyd LGA (to the east) and Fairfield LGA (to the south). The Nature Reserve was gazetted on 28 February 2007 and is one of the largest nature reserves in Western Sydney. The location of the Nature Reserve is shown on Map 1.

Surrounding land uses include the Prospect Reservoir, rural properties, Eastern Creek International Raceway, Western Sydney International Dragway, Eastern Creek International Karting Raceway, an automotive industrial area under development, Sydney Water Corporation (SWC) picnic facilities and a childcare centre under lease from the SWC.

Prospect Nature Reserve lies within the Western Sydney Parklands. These parklands cover 5,500 hectares and stretch for 27 kilometres from Blacktown to Liverpool along Eastern Creek and the hills of Hoxton Park. The parklands include open space areas for recreation as well as conservation areas. A detailed outline of the full scope of the purpose of these lands is provided in the Western Sydney Parklands Plan of Management 2020 (WSPT 2011).

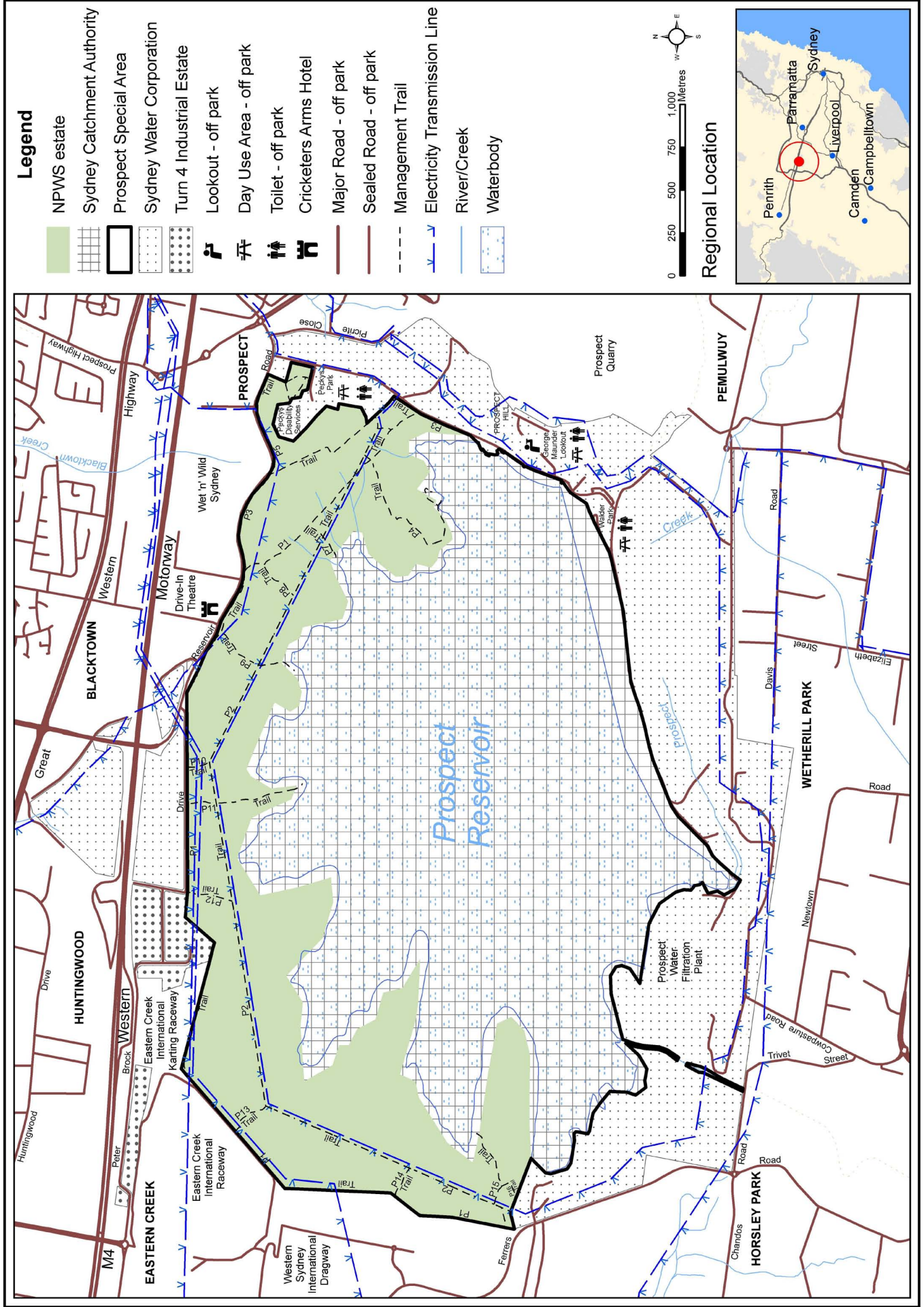
### **1.2 LANDSCAPE VALUES**

Natural and cultural heritage and on-going use are strongly inter-related and together form the landscape of an area. Much of the Australian environment has been influenced by past Aboriginal and non-Aboriginal land use practices and the activities of modern day Australians continue to influence bushland through recreational use, cultural practices, the presence of introduced plants and animals and in some cases air and water pollution.

The geology, landform, climate and plant and animal communities of the area, plus its location, have determined how it has been used by humans. This plan discusses the history of the Nature Reserve as it relates to the management of key issues.

Both Aboriginal and non-Aboriginal people place cultural values on natural areas, including aesthetic, social, spiritual, recreational and other values. Cultural values may be attached to the landscape as a whole or to individual components, for example to plant and animal species used by Aboriginal people. This plan of management aims to conserve both natural and cultural values. For reasons of clarity and document usefulness, natural and cultural heritage, non-human threats and on-going use are dealt with individually, but their inter-relationships are recognised.

Map 1. Prospect Nature Reserve.





Prospect Nature Reserve contains an extremely significant remnant of Cumberland Plain Woodland that formerly occurred extensively in Western Sydney. This community is restricted to the Western Sydney area and is inadequately conserved within the formal reserve system. Cumberland Plain Woodland is listed as a Critically Endangered Ecological Community under the NSW *Threatened Species Conservation Act 1995* (TSC Act) and under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Cumberland Plain is an area of 266,000 hectares covering a broad shallow basin in western Sydney (Ryde-Cattai-Thirlmere). The native vegetation of the Cumberland Plain has now been extensively cleared (75% has remnant vegetation areas of less than 0.5 hectares extent) with only 35,715 hectares (13.4%) still intact. Only 8,572 hectares (3.2%) is in public ownership and only about 4,427 hectares (1.6%) of this is currently protected within an area managed under the *National Parks and Wildlife Act 1974* (NPW Act). Prospect Nature Reserve is therefore an important addition in protecting Cumberland Plain Woodland.

The vegetation of Prospect Nature Reserve is also highly significant because of the diversity of plant species and communities present, and the generally good condition of the vegetation. Prospect Nature Reserve contains the largest area of Grey Box Woodland within the Blacktown LGA and this woodland is comprised of both the Shale Plains Woodland and Shale Hills Woodland elements of the Cumberland Plain Woodland Critically Endangered Ecological Community (NPWS 1997).

Prospect Nature Reserve includes a small pocket of cleared land, which drains off-catchment, within the north-eastern boundary of the Nature Reserve. This land lies adjacent to paddocks leased by SWC for horse agistment.

The Nature Reserve has had a long history of catchment protection and restricted access since the establishment of Prospect Reservoir in 1869. Ownership and management of Prospect Reservoir rests with the SCA.

The freshwater wetlands occurring on the margins of the reservoir are an artifact of inundation, but are significant because there are few large or intact examples in the region. However, their management is not part of this plan as they are part of the Sydney Catchment Authority (SCA) operating envelope for Prospect Reservoir.

A number of fauna species are known to occur on the Nature Reserve, and there is potential for additional species to occur, including threatened species. However the extent to which the area is utilised by fauna species is unknown since no long-term systematic surveys have been conducted.

These characteristics mean that Prospect Nature Reserve has important scientific and research values. The Nature Reserve and its surrounds, including the Eastern Creek landscape, are of significant cultural value to the Darug people. Prospect Nature Reserve also has value as an area of open space in the Sydney metropolitan area and as protection for part of Sydney's water supply.

## 2. MANAGEMENT CONTEXT

### 2.1 LEGISLATIVE AND POLICY FRAMEWORK

#### Background

A 1999 Memorandum of Understanding (MoU) between Sydney Water Corporation (SWC) and the NPWS (Sydney Water Corporation & NSW National Parks and Wildlife Service 1999) provided for the interim management of the bushland on the northern edge of Prospect Reservoir until the Prospect Nature Reserve was gazetted. With the creation of the SCA in 1999, land ownership transferred from SWC to the SCA. The land was subsequently subdivided from the reservoir, to enable the transfer of the land from the SCA to the NPWS for declaration as a Nature Reserve. As the land is both a Nature Reserve and a designated Special Area, the Nature Reserve will be managed in accordance with this Plan of Management and the Special Areas Strategic Plan of Management (SASPoM) (SCA & DEC 2007).

References to the “management authority” throughout this plan of management refer to the NPWS.

#### Nature reserves

Nature reserves in NSW are managed primarily under the NPW Act and Regulation, the TSC Act and the policies of the NPWS. The policies arise from the legislative background and internationally accepted principles of park management. They relate to nature conservation, Aboriginal and historic heritage conservation, recreation, commercial use, research and communication. Other legislation, international agreements and charters may also apply to management of the reserve.

Under the NPW Act, “the purpose of reserving land as a nature reserve is to identify, protect and conserve areas containing outstanding, unique or representative ecosystems, species, communities or natural phenomena”, to allow those areas to be managed in accordance with the management principles for nature reserves.

The management principles of nature reserves are defined in the Act (section 30J) as:

- (a) the conservation of biodiversity, the maintenance of ecosystem function, the protection of geological and geomorphological features and natural phenomena,
- (b) the conservation of places, objects, features and landscapes of cultural value,
- (c) the promotion of public appreciation, enjoyment and understanding of the nature reserve’s natural and cultural values,
- (d) provision for appropriate research and monitoring.’

Nature reserves are valuable refuge areas, where natural processes, phenomena and wildlife can be studied. They differ from national parks which include as a major objective the provision of appropriate recreation opportunities.

## Sydney Catchment Authority Charter

The charter of the SCA is described in the *Sydney Water Catchment Management Act 1998* (SWCM Act). The primary objectives of the SCA under this Act (section 14 (1)) are:

- (a) to ensure that the catchment areas and the catchment infrastructure works are managed and protected so as to promote water quality, the protection of public health and public safety, and the protection of the environment;
- (b) to ensure that water supplied by it complies with appropriate standards of quality;
- (c) where its activities affect the environment, to conduct its operations in compliance with the principles of ecologically sustainable development contained in section 6 (2) of the *Protection of the Environment Administration Act 1991*; and
- (d) to manage the Authority's catchment infrastructure works efficiently and economically and in accordance with sound commercial principles.

### *Special Areas*

Prospect Nature Reserve is part of Prospect Special Area. Special Areas are lands declared under the SWCM Act for their value in protecting the quality of the raw water used to provide drinking water to Sydney, the Illawarra and the Blue Mountains and other users, and for their ecological integrity.

Prospect Special Area was gazetted on 25 July 2008 and covers an area of 900.1 hectares. The Special Area includes both the reservoir (574.8 hectares) and Prospect Nature Reserve (325.3 hectares). The area is listed as Schedule 1 (No Access) under the SWCM Regulation 2008 to protect the water supply and to control pollution and disease. Public entry to the Nature Reserve is not permitted. As a Schedule 1 Special Area, the Regulation empowers the SCA to control the removal, use, contamination and pollution of waters and the contamination and pollution of land. This includes restricting activities relating to water, pollution, disease, stock, flora and fauna, fires and pest control.

Importantly, the permanent inundation of Special Areas is not allowed under the NPW Act when such areas are nature reserves or other lands reserved or dedicated under that Act. The boundary between the reservoir and Prospect Nature Reserve has been determined based on the probable maximum flood level of the reservoir. This ensures that the Nature Reserve will not be permanently flooded by the stored waters of the reservoir.

Prior to its designation as a Special Area, the site was designated as a 'Controlled Area' under the previous SWCM (General) Regulation 2000. The change in designation to a Special Area ensured SCA powers for water quality protection were retained following the transfer of land to the NPWS. Special Area designation also aligns Prospect with the Special Area designation that currently applies to the other lands that surround Sydney's drinking water storages.

## *Management*

The SCA and NPWS are committed by legislation to combine their specialist skills to manage Special Areas as joint sponsors. Sections 49 and 50 of the SWCM Act require the joint sponsors to prepare and give effect to a plan of management for each Special Area. This is in addition to any plan of management required under the NPW Act. The Special Areas Strategic Plan of Management (SASPoM) (SCA & DEC 2007) fulfils that obligation for Special Areas. The SASPoM provides long term goals and targets plus a suite of management actions which are used by the joint sponsors in developing annual work programs within Special Areas. The SASPoM is currently under review.

The management of Special Areas is administered by means of a Joint Management Agreement which outlines the roles of the SCA and NPWS for the management of Special Areas. The Joint Management Agreement outlines the following division of responsibility:

<b>Joint Sponsor</b>	<b>Over all Special Areas</b>	<b>Each on Own Land</b>
NPWS	Initial response to fire under CRAFT program	Asset construction and maintenance
	Security for reserve facilities	Ecosystem management
	Park management plans	Regulation of human activities
	Research on reserve values	Weed management
SCA	Control human activity	Pest management
	Control and manage security and restricted access	Fire management (non-CRAFT)
	Rehabilitation of the effects of mining	Restoration and rehabilitation
	Research water values	Heritage
	Water supply assets and augmentation of water supply	

A Service Contract for the Provision of Special Areas Land Management and Catchment Remote Area Firefighting Team (CRAFT) Services delivers funding from the SCA to the NPWS to undertake annual land management works. It outlines the framework by which the SCA presents the NPWS with priority activities for water quality protection. The NPWS then incorporates these into an annual program of activities through which works are reported and funded.

As a Special Area, the management of Prospect Nature Reserve will be consistent with the provisions of the SASPoM, Joint Management Agreement and Service Contract. Specific management actions for Prospect Nature Reserve will be as provided in this Plan of Management.

## 2.2 MANAGEMENT OBJECTIVES

The native vegetation on the Nature Reserve has been protected for a number of reasons. It is important in maintaining water quality within the Prospect Reservoir. This reservoir is a key component of the Sydney water supply network, and the native vegetation within the catchment plays an important role in maintaining water quality. Prospect Nature Reserve has also been recognised as important because it contains one of the largest and best conserved remnants of the Cumberland Plain Woodland critically endangered ecological community. It also contains a number of species that are listed as threatened under the TSC Act or are considered of regional significance. These characteristics also mean that the Nature Reserve has significant scientific and educational values. In addition to its natural values, the Nature Reserve also has important Aboriginal cultural values, as an area of open space and from a historic perspective.

In addition to the general objectives for nature reserves outlined in the NPW Act, the following specific objectives relate to the management of Prospect Nature Reserve:

- To maintain or improve the quality of water flowing through the Nature Reserve;
- To conserve and maintain existing native vegetation, including the Cumberland Plain Woodland;
- To conserve wildlife and habitat;
- To protect and preserve scenic natural features;
- To enhance or re-establish habitat in degraded areas;
- To protect Aboriginal cultural heritage values, and support the involvement of the local Aboriginal community in reserve management;
- To conserve significant European heritage items;
- To protect the Nature Reserve and adjacent areas from bushfire;
- To encourage appropriate scientific research; and
- To promote awareness of the values of the Nature Reserve to the community.

The Nature Reserve will also be managed consistent with the Recovery Plan for the Endangered Ecological Communities of the Cumberland Plain (DECCW 2010) (see section 3.2).

## 2.3 INTERESTS OF OTHER AGENCIES

Prospect Nature Reserve is dedicated under the NPW Act. No leases, licenses, indigenous interests, or covenants have been identified on the land. However, several easements for water supply, electrical and telephone transmission exist over the land.

Key agencies with an interest in the management of Prospect Nature Reserve are identified in Table 1 together with their anticipated interests and role.

**Table 1: Summary of other agencies and utilities with direct interests**

<b>Agency</b>	<b>Interests, role and issues</b>
Sydney Catchment Authority (SCA)	<ul style="list-style-type: none"> <li>• Joint sponsor in special area management</li> <li>• Undertakes human access control of the whole special area</li> <li>• Utilises neighbouring land and reservoir as a water storage</li> </ul>
Sydney Water Corporation (SWC)	<ul style="list-style-type: none"> <li>• Operates and maintains water infrastructure and associated easements within the Nature Reserve</li> <li>• Owns and manages adjacent facilities utilised by the public including picnic grounds,</li> <li>• Owns neighbouring land leased for horse agistment and disability respite care</li> </ul>
Western Sydney Parklands Trust (WSPT)	<ul style="list-style-type: none"> <li>• Prospect Nature Reserve is part of the Western Sydney Parklands</li> <li>• Western Sydney Parklands Trust manages the majority of the Western Sydney Parklands</li> <li>• Lands managed by the Trust adjoin the reserve</li> </ul>
Origin Energy (previously Integral Energy) / Transgrid	<ul style="list-style-type: none"> <li>• Utilises transmission line easements traversing the Nature Reserve</li> <li>• Responsible for vegetation clearing and maintenance within the easements to ensure safe operation</li> </ul>
Blacktown City Council (BCC)	<ul style="list-style-type: none"> <li>• Responsible for local government issues such as planning controls and management of adjacent roadsides and nearby reserves</li> <li>• The Nature Reserve is currently zoned 5(a) General Special Uses (Water Supply and Drainage Reservoir) and this zoning may need to be amended in future to reflect nature conservation values and the changed status of the land</li> <li>• The Nature Reserve is listed as a natural heritage site in Blacktown LEP</li> </ul>
Rural Fire Service (RFS)	<ul style="list-style-type: none"> <li>• Responsible for co-ordination of resources for prevention, mitigation and suppression of bushfires in rural fire districts, throughout the State and the protection of persons from injury or death, and property from damage, arising from bushfires.</li> <li>• Involved in fire management in Prospect via district bushfire committee which oversees hazard reduction and response to fires in Prospect Special Area</li> </ul>
NSW Fire Brigades (NSWFB)	<ul style="list-style-type: none"> <li>• Responsible for preventing and extinguishing fires and addressing hazardous material incidents (e.g. chemical spills) which may impact on the Prospect Special Area.</li> <li>• Under the Statement of Joint Intent with SCA, NSWFB has a special responsibility to work with SCA to address hazardous material incidents in SCA areas of operations including Prospect.</li> </ul>

### 3. CONSERVATION OF NATURAL AND CULTURAL HERITAGE

This section provides background information on Prospect Nature Reserve and describes the framework for its management. It also details the desired outcomes and the strategies to achieve the management objectives. Programs to achieve the desired outcomes, and their relative priority, are described in Table 4. Performance indicators have been developed to measure how well the strategies are being implemented.

Many of the actions will be linked to the delivery of actions under the SASPoM which outlines goals and actions to be undertaken across all Special Areas. The SASPoM will be used as a reference document when scoping key land management tasks.

#### 3.1 REGIONAL PLANNING AND LANDSCAPE

Prospect Nature Reserve forms an integral component of the Western Sydney Parklands. As such it forms an important component of a network of regional open space that has been part of the long term regional planning for western Sydney since at least 1968 (Sydney Region Outline Plan). Large components of the land were acquired into public ownership during the 1970s, and in 2001 the Sydney Regional Environmental Plan No. 31 – Regional Parklands (SREP 31) was released to manage the complexities of dealing with developments in the Parklands. SREP 31 has now been replaced by State Environmental Planning Policy (Western Sydney Parklands) 2009.

Land uses outside the Parklands in the vicinity of the Prospect Nature Reserve are controlled by a number of different planning instruments including the Blacktown Local Environmental Plan (LEP) 1988, Fairfield LEP 1994, Holroyd LEP 1991 and the State Environmental Planning Policy (Western Sydney Employment Area) 2009. Land uses permitted under these planning instruments as well as under the Western Sydney Parklands SEPP have the potential to impact on the Prospect Nature Reserve where those uses are adjacent to Prospect Nature Reserve.

Land reserved under the *National Parks and Wildlife Act 1974* should be identified and zoned correctly under any planning instrument that encompasses that reserved land. As such Prospect Nature Reserve should be identified in any relevant planning instrument as land reserved under the NPW Act.

#### Desired Outcome

- Land-use planning controls reflect and support the values of Prospect Nature Reserve as both a Nature Reserve and Special Area.

## Strategies

- Seek to have the land use zoning applied to the Prospect Nature Reserve under any relevant planning instrument reflect its status as land reserved under the National Parks and Wildlife Act.
- Work with the Western Sydney Parklands Trust and their lessees to promote sympathetic land uses and activities in the vicinity of the Nature Reserve.
- Develop strong linkages with adjoining Councils to promote sympathetic land uses in the vicinity of the Nature Reserve.

## 3.2 GEOLOGY AND LANDFORM

Prospect Nature Reserve is located on the Cumberland Plain, in an area of gently undulating land surrounded by rugged Hawkesbury sandstone terrain. The Nature Reserve's surface geology is Wianamatta Shale, which strongly influences the soils and vegetation occurring on the Nature Reserve. Regional scale soil landscape mapping undertaken in the area indicates the soil type occurring on the Nature Reserve is the Blacktown landscape. This landscape is characterised by shallow to moderately deep soils (<100cm), including red and brown podzolic soils on crests, and yellow podzolic soils on lower slopes and in drainage lines. The soils of the Blacktown landscape generally have low fertility, poor drainage and moderate erodibility (Bannerman & Hazleton, 1990).

The Nature Reserve contains unsealed management trails, and vegetated power line and water infrastructure, easements. There is potential for erosion and sediment generation from these trails, and consequent water quality impacts if they are not managed appropriately.

### Desired outcome

- The geology, geomorphology and soils within the Nature Reserve are protected.
- Water quality is protected.

## Strategies

- Ensure all developments and earth works within Prospect Nature Reserve minimise erosion, use compatible material, and incorporate soil erosion and sediment control works.
- No quarrying or soil removal will be undertaken in the Nature Reserve.
- Manage easements and access tracks to reduce erosion and off site impact from sedimentation.



### 3.3 NATIVE PLANTS

The most recent vegetation mapping for the area was undertaken in 2000 (NPWS, 2000) at 1:25,000 scale. It identifies the vegetation on the Nature Reserve as partly Shale Plains Woodland and partly Shale Hills Woodland.

These two vegetation communities are both components of the Cumberland Plain Woodland, which is listed as a critically endangered ecological community under the TSC Act and Commonwealth EPBC Act. NPWS (2001) describes Shale Hills Woodland as occurring mainly on the elevated and sloping southern half of the Cumberland Plain. It is the least widely distributed form of Cumberland Plain Woodland. The dominant canopy trees include Grey Box (*Eucalyptus moluccana*), Forest Red Gum (*E. tereticornis*) and Narrow-leaved Ironbark (*E. crebra*). The shrub layer is dominated by Blackthorn (*Bursaria spinosa*) and other shrubs including Hickory (*Acacia implexa*), Native Indigo (*Indigofera australis*) and Wedge-leaf Hop Bush (*Dodonaea viscosa ssp. cuneata*). The understorey layer of the community is diverse, consisting of a variety of grasses and herbs. Approximately 11.5% of the estimated extent of this community in 1750 still remains.

Shale Plains Woodland is more widely distributed than Shale Hills Woodland. Canopy trees in this community include Grey Box (*E. moluccana*), Forest Red Gum (*E. tereticornis*), Spotted Gum (*Corymbia maculata*) and Thin-leaved Stringybark (*E. eugenioides*). Blackthorn (*Bursaria spinosa*) is the most common shrub species and the species composition of the understorey is similar to that of the Shale Hills Woodland community. Approximately 7.6% of the estimated extent of this community in 1750 remains.

The vegetation communities on the Nature Reserve are transitional in nature and boundaries often cannot be clearly determined on the ground. The majority of the Nature Reserve (about two thirds) is Shale Hills Woodland, which reaches its northern limit on the Nature Reserve. The remaining third of the Nature Reserve has been mapped as Shale Plains Woodland. A Recovery Plan covering the endangered and critically endangered ecological communities of the Cumberland Plain, including Cumberland Plain Woodland, has been prepared (DECCW 2010).

Wetland communities occur at the edge of the reservoir where they have developed since inundation. As these communities lie within the boundary of the reservoir, they will remain the management responsibility of the SCA. Within the Nature Reserve itself, some wetland communities have become established from water pipeline leakages. These wetlands may disappear over time as these pipes are repaired. Wetlands in both the reservoir and the Nature Reserve are dominated by reed and rushes including *Juncus spp.* The diversity of wetland plant species is greatest for the longer term and more permanent wetlands surrounding the reservoir.

Prior to the detailed surveys in 2000, broad scale regional vegetation mapping for the area was undertaken by Benson (1992) and identified the native vegetation in the locality as 10d Grey Box – Ironbark Woodland. As part of the Western Sydney Urban Bushland Biodiversity Survey, NPWS (1997) undertook fieldwork in the vicinity of the Nature Reserve and compiled existing information relating to flora and fauna in the locality.

Field surveys have recorded around 250 native plant species at Prospect to date, although some of these may occur outside the Nature Reserve boundaries (Thomas, 1993; NPWS, 1997; NPWS 2000). The current composite plant list produced by amalgamation of these reports and, to some extent, reliance of one or the other may have introduced some inconsistencies. Future investigations should continue to focus on refining, verifying and adding to this list, particularly as significant areas of the Nature Reserve are vegetated with components of an endangered ecological community.

A number of the species in the locality are listed as threatened or considered to be of regional or state significance. Plant species listed under the TSC Act are outlined in Table 2 below. The list of significant species on the Nature Reserve is expected to change as further vegetation survey work in Western Sydney continues, additional species are considered or listed under the TSC Act, and records of some species not commonly found in the local area are either confirmed or refuted.

**Table 2: Flora species of significance recorded from the Nature Reserve**

Species	Status	Significance	Further Information
<i>Pimelea spicata</i>	E1	Listed as endangered species under TSC Act and at the national level under the EPBC Act. The 700 or so plants recorded at this site in a 6 hectare area south of Reservoir Road constitute the largest known population of the species (Recovery Plan - DEC 2004, pers comm. S. Burke DEC).	<a href="http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=20834">http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=20834</a>
<i>Acacia pubescens</i>	V	Listed as a vulnerable species under TSC Act and at the national level under the EPBC Act. Large (unconfirmed) stands recorded in north-west corner of the Nature Reserve and in a small gully in the north-east of the Nature Reserve	<a href="http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=18800">http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=18800</a>

There are also a number of plant species that are not listed under the TSC Act but were considered at risk in the Urban Bushland and Biodiversity Survey (UBBS) study at the local or regional scale and are therefore significant records. The UBBS study states that there are: “100 species on site considered to be vulnerable<sup>1</sup> and inadequately conserved in Western Sydney, including 13 species of particular regional significance, several of which are endemic to the region” (NPWS 1997).

A number of these potentially significant species have been recorded from Prospect Nature Reserve, including *Olearia microphylla*, *Myrsine howittiana*, *Rulingia dasphylla*, *Tricoryne simplex*, and *Lotus australis* (NPWS 1997).

[1 = vulnerable in the context of the UBBS Report in Western Sydney, not as a listed Vulnerable species under schedule 2 of the NSW TSC Act 1995].

A review of vegetation surveys shows that extensive field assessment has been undertaken on the Nature Reserve and in the locality over the last decade. This has primarily been to identify broad vegetation communities and to locate threatened species, and more recently to map the location of endangered ecological communities. The most recent mapping is of greatest accuracy and includes detailed floristic information rather than simply species lists. All surveys have primarily been undertaken to identify and map vegetation communities rather than address on-site management of vegetation communities or management of significant species.

### **Desired outcome**

- Protect the natural vegetation of Prospect Nature Reserve by maintaining natural processes, mitigating human impacts and implementing specific conservation programs.
- Ensure threatened species management is in accordance with recovery plans and the Priorities Action Statement.

### **Strategies**

- Encourage scientific research to improve vegetation management strategies (particularly of threatened or regionally significant plant species) on the Nature Reserve.
- Conduct a thorough floristic survey of the Nature Reserve and reconcile/verify existing plant species lists for the area.
- Implement vegetation management strategies consistent with relevant Recovery Plans and Priorities Action Statement.
- Take into account the presence of significant species and communities and their ecological requirements in all management activities (including fire and weed management).
- Accurately map and monitor the distribution of threatened plant species on the Nature Reserve, identify any threatening processes acting at the site, and record the success of any threat abatement programs.

## **3.4 NATIVE ANIMALS**

Thomas (1993) prepared a composite list of fauna species observed at or near Prospect compiled from unpublished lists. This list includes 9 amphibians, 11 reptiles, 17 mammals, and 145 birds. It does not identify when the species was observed, their habitat, or the reliability of observations.

The NSW Wildlife Atlas indicates there have been 105 native fauna species recorded from Prospect Nature Reserve.

The majority of native fauna species recorded in the Nature Reserve are mobile species such as birds and bats, but it is possible that there are some macropods and small mammals, possibly including squirrel gliders (*Petaurus norfolcensis*).

Recorded fauna species listed under the TSC Act are listed below in Table 3.

**Table 3: Fauna species of significance on the Nature Reserve and in the locality**

Scientific Name	Common Name	Status	Further Information
<i>Litoria aurea</i>	Green and Golden Bell Frog	E1 (V)	<a href="http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10483">http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10483</a> <a href="http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1870">http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1870</a>
<i>Pteropus poliocephalus</i>	Grey-headed Flying Fox	V	<a href="http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10697">http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10697</a>
<i>Myotis macropus</i>	Southern Myotis	V	<a href="http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10549">http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10549</a>
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	<a href="http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10604">http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10604</a>
<i>Mormopterus norfolkensis</i>	Eastern Free-tail Bat	V	<a href="http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10544">http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10544</a>
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	<a href="http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10331">http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10331</a>
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	<a href="http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10748">http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10748</a>
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	V	<a href="http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10534">http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10534</a>
<i>Meridolum corneovirens</i>	Cumberland Plain Land Snail	E1	<a href="http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10526">http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10526</a>
<i>Lathamus discolor</i>	Swift Parrot	E1 (E)	<a href="http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10455">http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10455</a>
<i>Hieraaetus morphnoides</i>	Little Eagle	V	
<i>Tyto novaehollandiae</i>	Masked Owl	V	
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	

E 1 = Endangered under the NSW TSC Act; V = Vulnerable under the NSW TSC Act; Listings under Commonwealth EPBC Act provided in brackets; (E) = Endangered under the EPBC Act; (V) = Vulnerable under the EPBC Act.

Prospect Nature Reserve may also support fauna species that are not listed on the TSC Act but are nonetheless significant at a local level. This local significance of some species is likely because the reserve is one of only a few in the Cumberland Plain that is large enough to support viable fauna populations, particularly of the larger more mobile species, in the long term. Similarly additional migratory species may utilise the reserve but would be absent much of the time and observations are dependent on the timing of survey efforts.

Ongoing research on fauna, fauna habitat utilization, and fauna response to management actions is desirable. Any fauna management decision will give consideration to water catchment values as well fauna management objectives.

### **Desired outcome**

- Protect the native fauna of the reserve by maintaining natural processes, mitigating human impacts and implementing specific conservation programs.

### **Strategies**

- Encourage scientific research into populations of fauna species (particularly threatened species) on the Nature Reserve and the utilisation of the reserve by these species as part of a regional corridor system.
- Develop a long-term fauna survey program, targeting threatened species and species of local and regional significance. The objective of the program would be to refine the existing lists for the area, determine the species present and monitor any changes in their populations as a result of management activities undertaken on the site. Consideration of management options will make reference to relevant priority actions statements, recovery plans and threat abatement plans.

## **3.5 REGIONAL LINKAGES AND CORRIDORS**

With the fragmentation of bushland in Western Sydney, vegetation corridors are important to facilitate the movement and survival of native fauna. They are also likely to be important for the long-term dispersal of plant species.

Within the Blacktown LGA one potential corridor has been identified along Eastern Creek, to provide a linkage of natural habitat to the bushland on the Nature Reserve. This partly corresponds with the Eastern Creek Regional Open Space recreation corridor and would provide long term links to other areas of remnant native vegetation. This link provides an important long term regional ecological context for the Nature Reserve and is likely to be important for dispersal and breeding for many of the fauna species potentially occurring on the Nature Reserve. The Western Sydney Parklands that encompass Blacktown LGA, and extends beyond into Fairfield and other LGAs, also provide important linkage and corridor/connectivity opportunities that may assist long term viability of some species.

The fence around the perimeter of the Nature Reserve (see section 4.5) is unlikely to restrict dispersal of arboreal species, although the fence is high enough to potentially restrict dispersal of ground-dwelling species such as macropods. However, the fence is necessary to restrict public access and to restrict the entry of feral animals that prey on native species.

The long-term pattern of open space and vegetation linkages within Western Sydney remains unclear and will be closely influenced by the recovery plan for the Endangered Ecological Communities of the Cumberland Plain (DECCW 2010).

Management of Prospect Nature Reserve as part of a regional vegetation corridor system will also need to address fire management and its implications for asset protection (e.g. water quality of the reservoir) and the ecological responses of vegetation to fire. Fire management is addressed in Section 4.4.

### **Desired outcome**

- Manage the Nature Reserve as a component of the regional vegetation network while maintaining human access restrictions.

### **Strategies**

- Research and develop methods to help native animal species move between the Nature Reserve and other areas of vegetation whilst restricting access to humans and feral animals.
- Work with other relevant organisations and neighbours to establish vegetation linkages.

## **3.6 ABORIGINAL HERITAGE**

Aboriginal people have occupied and made use of the natural resources of the greater Sydney Region for many thousands of years. The Nature Reserve and its immediate surroundings are within the traditional lands of the Darug people, and are now situated within the administrative boundaries of the Deerubbin Local Aboriginal Land Council. The Western Sydney Darug people have advised that the reserve has significant Aboriginal heritage value for them.

In February 2007 the Director-General of DECC (now OEH) signed a MoU that provided for the establishment of the Darug Peoples Advisory Committee to, inter alia, provide input to DECC in relation to decision-making on the protection and conservation of natural and cultural heritage within the area covered by the MOU, which included Prospect Nature Reserve. The Darug Peoples Advisory Committee was consulted during the finalisation of this plan. Although the term of the Darug Peoples Advisory Committee has now expired, NPWS will continue to consult with the Darug people and the Deerubbin Local Aboriginal Land Council regarding the cultural values of Prospect Nature Reserve.

A search of the NPWS Aboriginal Heritage Information Management System (AHIMS) shows records of two Aboriginal sites within the boundaries of the Nature

Reserve. Archaeological surveys at Prospect Reservoir have been restricted to areas proposed for and adjacent to construction works (Thomas 1993) and have located items of potential Aboriginal cultural significance including open artefact scatters, isolated finds and scarred trees. Thomas (1993) states that a survey of the northern shore of the reservoir was undertaken in 1986 but did not locate any sites because of poor visibility.

Although the area has been grazed it is considered unlikely that it would have been ploughed. Accordingly, there is potential for Aboriginal heritage sites to occur on the land, due to the low level of disturbance of the site. The relatively recent reports of Mills (1999), Brayshaw & White (1999), Stevens & McDonald (2006) and references cited therein provide a basis for assessment of Aboriginal cultural values. An overview study to provide a synthesis of the various reports documenting Aboriginal cultural values of sites throughout western Sydney is currently in preparation (K. Przywolnik pers. comm.). This study will provide baseline information that should enable a better perspective to be placed on the regional significance of the cultural values protected within the reserve. Management decisions should be influenced by this new information as it becomes available.

Aboriginal heritage issues will be important in managing the Nature Reserve. However, with limited disturbance likely, few specific heritage management issues are likely to arise. Where works/activities causing ground disturbance do become necessary, any required assessments should be undertaken as early as possible in the planning process. This will enable appropriate strategies to be developed and implemented.

### **Desired outcome**

- All items of Aboriginal heritage significance on the Nature Reserve are recorded and protected.
- Darug people are involved in management of the Nature Reserve and the continuation of their culture, including learning and teaching traditional knowledge.

### **Strategies**

- Undertake a site survey and assessment of the Aboriginal cultural values of the Nature Reserve and record any Aboriginal sites and/or places into the NSW NPWS Aboriginal Heritage Information Management System (AHIMS – previously referred to as the Aboriginal sites register).
- Conduct Aboriginal heritage assessments in consultation with the Darug people and the Deerubbin Local Aboriginal Land Council before undertaking any works, and protect any sites found.
- Manage Aboriginal sites and places in consultation with the Darug Aboriginal community and the Deerubbin Local Aboriginal Land Council.

- Manage cultural visitation and research by Aboriginal communities in consultation with the Darug people and the Deerubbin Local Aboriginal Land Council and in compliance with the SCA's access policies and protocols.
- Pursue opportunities to involve and employ Darug and other Aboriginal people in reserve management, to collect history and record stories of the reserve's significance, and to research and monitor cultural heritage. Any activities involving access to the reserve are to be in compliance with the SCA's access policies and protocols.

### **3.7 HISTORIC HERITAGE**

A list of European heritage items was compiled for the SWC land at Prospect (Thomas 1993), but related primarily to water supply infrastructure. Prospect Reservoir and its surrounding area are listed on the State Heritage Register, with the listing noting that the surrounding landscape is important for "punctuating the surrounding urban landscape". However, there do not appear to be any listed heritage items within the Nature Reserve. Items of potential heritage value within the Nature Reserve include old fence posts along the eastern boundary of the site.

#### **Desired outcomes**

- Any items of historic heritage found on the Nature Reserve, are recorded, assessed for their significance, and appropriately conserved.
- The landscape values of the Nature Reserve are conserved.

#### **Strategies**

- Encourage a heritage survey and research into the history of the Nature Reserve.
- Retain the old fence posts and undertake an assessment of their cultural heritage value.



## **4. WATER QUALITY**

### **4.1 WATER QUALITY AND CATCHMENT MANAGEMENT**

#### **Prospect catchment**

Prospect Reservoir is located on Prospect Creek. The catchment area for the reservoir includes a small area of land adjacent to the reservoir. This land area includes the Prospect Nature Reserve to the north and land owned by SWC to the south of the reservoir. Although the Nature Reserve itself will be managed by the NPWS, responsibility for managing the reservoir remains with the SCA. This includes that area of land below the probable maximum flood level of the reservoir. Accordingly, it is important that the Nature Reserve is managed to ensure maintenance of high water quality within the storage.

The SCA currently undertakes raw water quality monitoring at the inlet of Prospect Water Filtration Plant and in the storage itself. As the catchment for the reservoir extends beyond the Nature Reserve, activities within and beyond the Nature Reserve have the potential to impact on stored water quality. However, more water comes into the reservoir from the Upper Canal than through run-off from the catchment.

#### **Prospect Dam and Reservoir**

Prospect Dam was completed in 1888 with the original purpose of supplying water to Sydney. Prospect Reservoir stored water fed by gravity from the dams of the Upper Nepean system, via the Upper Canal. Pipelines were then created in 1940 and 1966 enabling the transfer of water from Warragamba Dam to Prospect Reservoir. Over time, the role of Prospect Reservoir changed from being a primary source of Sydney's water supply to an emergency holding and backup reservoir.

Following the 1998 Sydney drinking water incident, Justice Peter McClellan recommended that alternative water sources to Warragamba be investigated. Prospect provided the best alternative. Consequently, Prospect is now used as a reserve storage and forms an integral part of SCA's operating system for the provision of bulk raw water. To meet this role, the water at Prospect needs to be of good quality and available at short notice.

The reservoir provides an off-line storage for alternative water supply during water quality events at Warragamba. The reservoir provides an additional water supply to meet future demand peaks when the Upper Canal and Warragamba Pipelines are unable to meet water demand. The water can also be accessed when routine maintenance of the Warragamba Pipeline or the Upper Canal is required.

A new raw water pumping station was recently constructed and commenced operation in 2007. The pumping station is designed to transfer up to 1,400 megalitres of water per day, for a limited period, from Prospect Reservoir to SWC's water filtration plant at Prospect. While the station is only likely to be used once a year for this purpose, this potentially affects the water in the top seven metres of Prospect Reservoir and means that there is likely to be greater variation in water storage levels than in the past.

The construction of the new raw water pumping station has enabled water to be available at call for the following purposes:

- To provide an alternative water source in the case of a water quality event;
- To provide a back-up water supply in the event of any failure of the Warragamba Pipelines or Upper Canal;
- To enable a more extensive maintenance program to be conducted on the Upper Canal and Warragamba Pipelines than previously;
- To supply additional water to meet future demand peaks when the Upper Canal and Warragamba Pipelines are unable to meet water demand;
- To mitigate any chemical spill in the catchments feeding the Prospect Water Filtration Plant; and
- To receive water of suitable quality from external sources such as roof water.

Water transfers may at times influence the quality and volume of water in the reservoir. Under normal operating procedures, water from the Upper Canal and Warragamba pipeline is transferred directly to the Prospect Water Filtration Plant. However, the reservoir receives some periodic influxes of water from the Upper Canal and is able to receive water from the Warragamba Pipeline if required. These supplement the small catchment area in contributing to water levels in the Reservoir.

Protection of the water quality of the reservoir is retained through Special Area designation of both the reservoir and the Nature Reserve. As a Special Area, Prospect Nature Reserve will be managed in accordance with the Special Areas Strategic Plan of Management (SASPoM).

### **On-site activities**

Pollutants from activities conducted in the Nature Reserve, including works in and around easements and access roads, can enter Prospect Reservoir suspended in stormwater. Activities with the potential to produce pollutants include pesticide and herbicide use, works involving vegetation removal and soil disturbance and fire management practices. Degradation of vegetation may potentially have a detrimental impact on water quality. Vegetation acts as a filtration system for pollutants and its degradation may reduce its effectiveness as a filter.

### **Off-site activities**

Pollutants from activities conducted off-site can enter the Nature Reserve, and subsequently Prospect Reservoir, suspended in stormwater. The management authority can implement on-site practices to minimise the impacts of off-site pollutants and can educate catchment users about stormwater pollution. As the catchment for the reservoir is primarily the Nature Reserve itself, the potential for off-site stormwater impacts is not considered significant. However, no research has been conducted into the extent of road and urban runoff onto the Nature Reserve.

## Desired outcomes

- Ensure Prospect Nature Reserve is managed as a Special Area under the SWCM Act.
- Activities in the Nature Reserve do not have a detrimental impact on water quality in the reservoir, including but not limited to the use of pesticides and herbicides and the management of degraded areas.
- Management trails and easements are managed to control erosion and sediments.

## Strategies

- Manage Prospect Nature Reserve as a Special Area and in accordance with the Special Areas Strategic Plan of Management (SASPoM).
- Use pesticides and herbicides as directed on the labels and in accordance with best practice to minimise impacts on water quality.
- Design and undertake all earth works within Prospect Nature Reserve in a manner that minimises erosion, uses compatible material and incorporates soil erosion and sediment control works.
- Undertake only those activities that will not compromise water quality from sediment runoff.
- Incorporate stormwater pollution prevention messages into interpretative signage and/or brochures developed for the Nature Reserve.
- Consider the results from the SCA water quality monitoring program and SCA's Water Quality Risk Management Framework when reviewing programs and management of the Nature Reserve.
- Liaise with surrounding landholders, Blacktown Council and other relevant authorities to ensure that their activities do not impact negatively on the Nature Reserve.

## 4.2 INTRODUCED PLANTS

The long-term impact of weeds and introduced species on native vegetation communities is a very important issue for biodiversity conservation on the Nature Reserve. Weeds on the Nature Reserve occur as scattered individuals or localised concentrations and are a minor component of the vegetation (NPWS, 1997). The most problematic species have been identified as African Olive (*Olea europaea subsp. africana*) and Moth Plant (*Araujia hortorum*), together with small patches of Large-leaved Privet (*Ligustrum lucidum*<sup>\*</sup>), Kikuyu (*Pennisetum clandestinum*), Rhodes Grass (*Chloris gayana*) and African Love Grass (*Eragrostis curvula*). Other

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<sup>\*</sup> Noxious weed declared in the Hawkesbury River County Council weed control area.

weeds include Lantana (*Lantana camara*\*), Blackberry (*Rubus fruticosus*\*), Pampas Grass (*Cortaderia selloana*\*), Bridal Creeper (*Asparagus asparagoides*\*), Sharp or Spiny Rush (*Juncus acutus*) and Arum Lily (*Zantedeschia aethiopica*).

Thomas (1993) compiled a weed list for the Nature Reserve comprising 46 species, highlighting 14 key weed species that should be controlled. It is likely that additional non-native species occur in the Nature Reserve and the issue of weeds on the reserve should be reviewed as a priority.

The Nature Reserve is within the jurisdiction of Hawkesbury River County Council, established in 1948 for the sole purpose of controlling noxious weeds. Member Councils of the Hawkesbury River County Council include: Baulkham Hills Shire Council, Blacktown City Council, Hawkesbury City Council and Penrith City Council.

On 1 March 2006, amendments to the *Noxious Weeds Act 1993* came into force (via *Noxious Weeds Amendment Act 2005*). The amendments replace all of the old "W" categories for noxious weeds with five new classes: Class 1 - State Prohibited Weeds; Class 2 - Regionally Prohibited Weeds; Class 3 - Regionally Controlled Weeds; Class 4 - Locally Controlled Weeds, and; Class 5 - Restricted Plants for sale or distribution. As at 1 March 2006, within the Hawkesbury River County area, there were 90 weed species listed as noxious in accordance with the amended *Noxious Weeds Act 1993*.

Weed invasion is related to disturbance associated with soil disturbance, roads, tracks, changes to natural drainage, and rubbish dumping. Leaking Sydney Water pipes are a major source of nutrients that encourage weeds. The Nature Reserve would benefit by a weed management plan developed jointly by NPWS, the SCA and Sydney Water with input from personnel with bush regeneration experience in the Cumberland Plain Woodland communities. It should also use the information and guidelines for weed management outlined in the DEC (2005), DIPNR (2003), and Greening Australia NSW (1999) guidelines along with recommendations in any relevant recovery plan. The plan should also refer to the overarching special areas pest and weed management plan being developed under the SASPoM in 2009/10, and the NPWS regional pest management strategy. The plan would need to be implemented in an adaptive manner to account for strategies potentially becoming irrelevant and provide guidance on appropriate weed control methods and priorities. The plan should be revisited on a regular basis and revised when necessary.

### **Desired outcome**

- Control the spread, and where possible reduce and/or remove populations, of weed species in the Nature Reserve.

### **Strategies**

- Update the NPWS regional pest management strategy, including weed control strategies for the Nature Reserve, in consultation with the SCA and Sydney Water and with reference to the overarching special areas pest and weed management plan.

- Establish a monitoring program to measure the effectiveness of weed management actions and monitor the invasion and spread of new weeds.
- Encourage collaborative programs with neighbouring landholders to control the invasion and spread of weeds and other introduced plants into and within the Nature Reserve.
- Liaise with Sydney Water to facilitate the repair of water pipelines leaking into the Nature Reserve.

### **4.3 INTRODUCED ANIMALS**

The NPWS Wildlife Atlas shows historic records of feral species on the Nature Reserve, including rabbits, foxes, feral cat, horse, brown hare, house mouse, and black rat. With the exception of rabbits, foxes and house mice, all other feral species recorded were single sightings only. The SCA's information on feral animal species indicates that the most common feral animals on the Nature Reserve are foxes, rabbits, dogs and cats. The fence around the Nature Reserve perimeter minimises opportunities for feral animals to enter the site, however dumping of animals also occurs and may augment feral animal populations within the Nature Reserve. This fencing provides some protection to native fauna that might otherwise be out-competed, or become prey for these feral species.

In 1973 a control program for pigs was implemented and pigs have not recurred. More recently a dog control program was conducted on the Nature Reserve. A joint control program for rabbits and foxes, coordinated by the former Rural Lands Protection Board (now the Livestock Health and Pest Authority), was undertaken on the nearby quarry and surrounding SWC lands in 2001.

#### **Desired outcomes**

- Introduced animals are controlled and where possible eliminated.
- Feral animal programs have minimal impact on biodiversity and water quality.

#### **Strategies**

- Update the NPWS regional pest management strategy, including feral animal control strategies for the Nature Reserve, in consultation with the SCA and Sydney Water with reference to the overarching special areas pest and weed management plan.
- Establish a long term monitoring program of feral animal populations within the Nature Reserve.
- Maintain fencing to control access by feral animals and to reduce the impact of human dumping of animals adjacent to the Nature Reserve.

#### 4.4 FIRE MANAGEMENT

The NPWS is responsible for controlling fires on land it manages to protect life, property and natural and cultural heritage. Fire is a natural phenomenon in many Australian landscapes and many vegetation communities therefore rely on fire as part of their natural processes. Accordingly, it is important the management authority considers biodiversity as well as the protection of life and property. As Prospect Nature Reserve is located in a water supply catchment, it is also important that fire management be undertaken in a way which minimises adverse impacts on Prospect Reservoir.

A Fire Management Strategy (FMS) has been prepared for Prospect Nature Reserve (NPWS 2009). The FMS details specific fire management measures for the reserve. All fire management activities within Prospect Nature Reserve will be undertaken in accordance with the FMS.

The FMS describes the bushfire environment of Prospect Nature Reserve in relation to wildfire, prescribed burning, fire behaviour potential, and damage potential. The main tool for managing the bushfire environment is dividing Prospect Nature Reserve into six fire management zones, and managing these zones to achieve the objectives of the FMS. Water quality safeguards are provided by a fire exclusion zone adjacent to Prospect Reservoir.

The FMS describes how assets will be protected from fire and provides fire management schedules for protecting biodiversity, cultural heritage and infrastructure. The FMS has informed and is consistent with the *Cumberland Zone Bush Fire Risk Management Plan* (Cumberland Zone Bush Fire Management Committee 2010). NPWS is a member of the Cumberland Zone Bush Fire Management Committee. Bush fire management for Western Sydney Parklands is detailed in the parklands bushfire management strategy and implementation program (WSPT 2009). It supports the FMS by specifying bush fire management controls on adjacent parkland areas in consideration of the Nature Reserve's assets.

##### Desired outcomes

- Life and property, natural and cultural heritage are protected.
- Water quality impacts are minimised.
- Ensure fire management takes account of ecological responses to fire and water quality.

##### Strategies

- Implement the Prospect Nature Reserve Fire Management Strategy.
- Review and revise the annual fire management works program on an annual basis, with input from the SCA and Sydney Water to ensure water quality is protected.

- Manage vegetation having regard to water quality protection and ecological responses to fire.
- Maintain all Asset Protection Zones to ensure water quality is not compromised by fire.
- Periodically review the Prospect Nature Reserve Fire Management Strategy in consultation with the SCA and update as necessary.
- Support Darug people in the implementation of traditional Aboriginal fire management practices where the traditional knowledge and understanding is available, consistent with the reserve's fire management strategy.

#### **4.5 PUBLIC ACCESS**

In order to minimise the potential for pollution of the water supply catchment, access to Prospect Nature Reserve and the Reservoir by the public is prohibited in accordance with the SWCM Regulation 2008. However, the Nature Reserve has in the past been subject to illegal access by people for activities such as fishing and obtaining access to Eastern Creek Raceway. Rubbish dumping occurred on the Nature Reserve in the past and now occurs on public roads adjacent to the Nature Reserve.

The Nature Reserve perimeter to the north and west is bounded by a 1.8 metre high wire mesh fence topped with barbed wire with locked gates at various points. The perimeter to the east is bounded by a low fence of concrete fence posts connected by horizontal wire. The perimeter to the south is Prospect Reservoir.

General public access to Prospect Nature Reserve will continue to be prohibited to protect water quality in the Reservoir and the sensitive vegetation communities on the reserve (other sections of this plan refer to access by Aboriginal people and for research purposes, refer sections 3.6 and 6). Accordingly, no recreational facilities will be provided and the area will not be promoted for recreation. A playground and other picnic facilities exist to the east of the Nature Reserve on land owned by SWC and these provide a vista of Prospect Reservoir and Prospect Nature Reserve. More intensive recreational facilities occur to the west and north of Prospect Nature Reserve and the Reservoir (such as Eastern Creek International Raceway, Western Sydney International Dragway and Eastern Creek International Karting Raceway). These provide alternative recreational opportunities, however, they may also serve as entry points for illegal access into the Nature Reserve. The SCA will control all authorised and unauthorised access to Prospect Nature Reserve as per the SWCM Act and Regulation.

#### **Desired outcome**

- Access to Prospect Nature Reserve is restricted to protect water quality in Prospect Reservoir and biodiversity in the Nature Reserve.

## Strategies

- Prohibit public access to the Nature Reserve.
- Keep the gates in the perimeter fences locked at all times and only open them for access by authorised personnel.
- Continue compliance monitoring adjacent to and within the Nature Reserve to control access.
- Investigate the need for and undertake installation of new fencing to improve security and manage access where appropriate.
- Erect regulatory signs at strategic sites along the perimeter fence explaining the significance of Prospect Nature Reserve and the reasons it is not accessible to the public.
- Conduct regular inspections of the fence to check for damage and breaches and report these to SCA for repair.
- Liaise with Western Sydney Parklands Trust, neighbouring major recreational facility providers and any current and future neighbouring landholders regarding measures to prevent illegal entry to the Nature Reserve.

Note: As the land is a designated Special Area, the SCA will maintain fences, gates and regulatory signage, and will be responsible for access controls and consents.



## **5. PUBLIC EDUCATION**

The primary purpose of nature reserves is to conserve wildlife and natural environments and encourage environmental education and scientific research in relation to these resources. Nature reserves also perform a role in the maintenance of water quality through the application of appropriate management practices to achieve this.

As Prospect Nature Reserve forms part of a water supply catchment, and maintenance of water quality is a key concern, educational resources will have an off-site focus and aim to increase public understanding about the importance of the Prospect Nature Reserve as both an example of an endangered ecological community and as a resource for maintaining water quality. The responsibilities of the management authority in maintaining this area for conservation rather than recreation will also be promoted.

Education and awareness about the reserve's Aboriginal heritage and culture should be guided by the Darug people and the Deerubbin Local Aboriginal Land Council. As for all interpretation activities, these will need to be off-site due to the Schedule 1 Special Area status of the reserve. Therefore signage in the reserve is not advisable. Any Aboriginal signage should be located in surrounding public open space areas and include information about the significance of the general area.

### **Desired outcome**

- Community understanding and appreciation of the importance of Prospect Nature Reserve to protect the endangered Cumberland Plain Woodland community and water quality of the Reservoir.

### **Strategies**

- In consultation with SWC and SCA, place interpretive signage about the Nature Reserve at strategic locations in the adjoining SWC recreation area.
- Develop a joint education plan with the SCA, SWC and neighbours, such as Western Sydney Parklands Trust, with input sought from Darug descendents and the Deerubbin Local Aboriginal land Council.
- Ensure any access for educational purposes is in compliance with SCA's access policy and protocols.

## 6. RESEARCH AND MONITORING

As Prospect Nature Reserve is part of a drinking water catchment, only scientific research that does not threaten water quality in Prospect Reservoir will be permitted. Scientific research in Prospect Nature Reserve will be directed towards improving the management of natural and cultural heritage and the processes which impact on them. Areas of research from which the management of the Nature Reserve would benefit include:

- Distribution and management requirements of threatened flora and fauna species and communities
- Fire ecology
- Effect of management activities on water quality
- Impacts from off-site runoff
- Fauna populations over the long-term
- Populations of feral animal species
- Items of Aboriginal or European cultural significance, and
- Areas of degraded land (including contamination studies).

Other scientific research proposals will be considered, provided they assist the management authority in managing the Nature Reserve.

All research in Special Areas is to come under SCA policies and only the SCA will be able to permit access as part of the management of an access policy.

### Desired outcome

- All scientific research assists in management of the Nature Reserve and has no detrimental impact on water quality in Prospect Reservoir.

### Strategies

- Encourage use of Prospect Nature Reserve for appropriate research which assists in managing water quality and ecological integrity with SCA approval.
- Give priority to research proposals which will improve management of the Nature Reserve.
- All research will be subject to the SCA's access and research policies and the management authority's policies and procedures in relation to permits, licences, conduct of research and production of results.
- Any research into Aboriginal sites or places will be conducted in consultation with the Deerubbin Local Aboriginal Land Council, Darug people, and the SCA.
- A prospectus will be prepared as a guide to preferred research projects in the Nature Reserve and circulated to relevant tertiary institutions.

## 7. OTHER USES

Public utilities on Prospect Nature Reserve include:

- Transmission lines (TransGrid, Origin Energy);
- Water pipelines (SWC);
- Underground telecommunications cable (Telstra); and
- Survey points (SCA).

The authorities responsible for managing these utilities must periodically access them for maintenance purposes. Issues associated with maintaining these utilities include: removal of vegetation regrowth under transmission lines, maintenance of towers and poles, maintenance of pipelines, minor removal of vegetation for water main maintenance, soil disturbance, vehicle entry and maintaining access routes. Cleared areas must be maintained along transmission line routes to allow access for maintenance and prevent vegetation interfering with transmission lines.

The NPW Act enables Government or related authorities to continue managing their “existing interests” when lands are dedicated as nature reserves. Existing interests include any authority, authorisation, permit, lease, licence or occupancy. Existing easements are denoted on the deposited plans and land titles that apply to the Nature Reserve and provide existing rights to the utility providers concerned. New easements or other interests created over the Nature Reserve would need to take into account the status and management of the land of both a Nature Reserve and as a Special Area.

The SWC has entered into an "Access Agreement for Routine Operation, Maintenance and Inspection of Sydney Water Infrastructure in Parks and Reserves - Consent & Protocol" (signed March 2007) with the NPWS which covers inspections, routine maintenance and operations within national parks and reserves. The SWC also has several agreements with the SCA including the Bulk Water Supply Protocols and the Multi-site Review of Environmental Factors: Maintenance Works on Sydney Catchment Authority Lands (Sydney Water 2005). However, the SCA currently does not have any site-specific agreements with other utility providers regarding site access or maintenance of utilities. Power line maintenance activities in lands administered by the NPWS are subject to procedures in a 2020 Agreement between the NPWS and TransGrid for the inspection and maintenance of TransGrid infrastructure on NPWS areas. These procedures are generic and apply to all lands administered by the NPWS. In addition to routine maintenance, the Nature Reserve may need to be accessed by organisations other than the management authority in emergency situations (e.g. bushfire and hazardous materials spillage).

Agreements will need to be developed between the SCA, NPWS, utilities and emergency services regarding site-specific access and maintenance activities. This will include agreements between NPWS, SCA, and other utilities regarding ongoing access to the Nature Reserve. The purpose of these agreements will be to ensure that site access and maintenance by third parties is consistent with the management

objectives of the Nature Reserve and best environmental practices. The agreements should address issues including but not limited to:

- Maintaining tracks (e.g. grading, gravelling, width)
- Frequency of clearing and extent of clearing of vegetation regrowth under power lines
- Renegotiation of responsibilities
- Other maintenance procedures that will be undertaken.

As the SCA controls human access to Special Areas, any agreement will require SCA approval for access control.

### **Desired outcomes**

- Utility maintenance activities are conducted in accordance with site-specific agreements and have minimal environmental impacts on the Nature Reserve.
- Environmental impact assessments take into account the presence of Aboriginal sites, significant flora and fauna species and communities and their ecological requirements, and potential impacts on water quality.
- Appropriate access is provided for emergency and management operations.

### **Strategies**

- SCA and NPWS will develop site-specific access and maintenance agreements with utilities, emergency services and other authorised user groups.
- Any authorities requiring access to Prospect Nature Reserve will require approval from the SCA. The SCA will advise the NPWS of any requests for entry.
- Annual audits of maintenance activities will be undertaken to ensure they are consistent with utility authority agreements and that maintenance activities have minimal environmental impact. Copies of such audits will be provided to the SCA.
- Review the management requirements for individual tracks, and maintain to appropriate standards all tracks necessary for essential services and management purposes.
- Existing interests, including easements, to be managed in accordance with existing management provisions. Any new easements or interests to be negotiated with NPWS and the SCA and have regard to the status of the land as a Nature Reserve and Special Area.

## 8. IMPLEMENTING THE PLAN OF MANAGEMENT

This plan of management establishes a scheme of operations for Prospect Nature Reserve.

The plan is part of a system of management developed by the NPWS and also reflects the requirements of the SCA.

Section 81 of the NPW Act requires that this plan of management shall be carried out and given effect to, and that no operations shall be undertaken in relation to Prospect Nature Reserve unless they are in accordance with the plan.

Implementation of this plan will be undertaken within the annual programs of the NPWS Metropolitan South West Region. The actions identified in the plan are those to which priority will be given in the foreseeable future. Other management actions may be developed consistent with the plan objectives and strategies.

Relative priorities for identified strategies are set out in Table 4 below. The table also contains performance indicators to measure the success of these strategies. These priorities have been determined collaboratively by the SCA and NPWS, and are subject to the availability of necessary staff and funds and to any special requirements of the Director-General or Minister of the management authority. The implementation of the plan will be monitored and its success in achieving the identified objectives will be assessed.

The environmental impact of proposed activities will be assessed at all stages in accordance with established environmental assessment procedures. Where impacts are found to be unacceptable, activities will be modified in accordance with the plan policies.

This plan of management does not have a specific term and will stay in force until amended or replaced in accordance with section 73B of the NPW Act. The plan applies both to the land currently defined as Prospect Nature Reserve and to any future additions. Where management strategies or works are proposed for additions (or the existing area) that are not consistent with the plan, an amendment to the plan will be required.

### **Desired outcome**

- The Plan of Management is successfully implemented.

### **Strategies**

- Undertake an annual review and report progress in implementing this plan of management.
- After five years, assess how effectively the Prospect Nature Reserve has been managed in accordance with this plan and how successfully the plan's objectives and desired outcomes have been achieved. This assessment

should take into account the results of the monitoring programs set out in this plan and any others that may be developed.

Strategies requiring a specific action to be undertaken by the management authority have been prioritised on a three-tiered scale, being considered either of high, medium or low priority (see Table 4). The following criteria have been used to allocate priorities:

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

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

**Low priority:** activities desirable to achieve management objectives and desired outcomes but which can wait until resources become available.

Timeframes for priorities will also be guided by the Special Areas Strategic Plan of Management (SASPoM).

**Table 4: Priority of strategies and performance indicators to measure implementation success**

Objective	Strategies	Performance indicators	Plan reference	Priority
To maintain or improve the quality of water flowing through the Nature Reserve and into Prospect Reservoir	Manage Prospect Nature Reserve as a Special Area and in accordance with the Special Areas Strategic Plan of Management (SASPoM)	Annual reporting of SASPoM	4.1	High
	Use pesticides and herbicides as directed on labels and in accordance with best practice to minimise impacts on water quality	Records of pesticide use kept	4.1	High
	Design and undertake all development and earth works within Prospect Nature Reserve in a manner that minimises erosion, uses compatible material, and incorporates soil erosion and sediment control works	Earthworks incorporate soil erosion and sediment control measures	3.2, 4.1	High
	Undertake only those activities that will not compromise water quality from sediment runoff	Water quality of reservoir maintained and not adversely affected by management actions	4.1	High
	Incorporate stormwater pollution prevention messages into interpretative signage and/or brochures developed for the Nature Reserve	Messages incorporated	4.1	High

To conserve and maintain existing native vegetation	Consider the results from the SCA's water quality monitoring program and SCA's Water Quality Risk Management Framework when reviewing programs and management	Water quality results and risk management framework considered	4.1	High	
	Liaise with surrounding landholders, Blacktown Council and other relevant authorities to ensure that their activities do not impact negatively on the Nature Reserve	Records of correspondence and meetings maintained	4.1	High	
	No quarrying or soil removal will be undertaken in the Nature Reserve	No quarrying or soil removal occurs on the Nature Reserve	3.2	High	
	Manage easements and access tracks to reduce erosion and off site impact from sedimentation	Easements and tracks managed in accordance with best practice	3.2	High	
	To conserve and maintain existing native vegetation	Encourage scientific research to improve vegetation management strategies (particularly of threatened or regionally significant plant species)	Research undertaken	3.3	Medium
		Conduct a thorough floristic survey of the Nature Reserve and reconcile/verify existing plant species lists for the area	GIS layer and plant list species produced	3.3	High
		Implement vegetation management strategies consistent with the relevant Recovery Plans and Priorities Action Statement	Implementation consistent with the Recovery Plan and Priorities Action Statement	3.3	High



To conserve wildlife and habitat	Take into account the presence of significant species and communities and their ecological requirements in management activities (including fire and weed management)	Ecological impacts taken into account during environment impact assessment procedures	3.3	Medium
	Accurately map and monitor the distribution of threatened plant species on the Nature Reserve, identify threatening processes, and record the success of threat abatement programs	GIS layer of threatened plant species produced, threatening processes identified, and changes as a result of programs recorded	3.3	High
	Update the NPWS regional pest management strategy, including weed control strategies for the Nature Reserve, in consultation with the SCA and with reference to the Special Areas weed and pest management plan	Regional pest management strategy updated	4.2	High
	Establish a monitoring program to measure the effectiveness of weed management actions and monitor the invasion and spread of new weeds	No new invasions or spread of existing weeds	4.2	High
	Encourage collaborative programs with neighbouring landholders to control the invasion and spread of weeds and other introduced plants into and within the Nature Reserve	Collaborative programs for weed control established	4.2	High
	Liaise with Sydney Water to facilitate the repair of water pipelines leaking into the Nature Reserve	Leaking pipes repaired	4.2	High
	Encourage scientific research into populations of fauna species (particularly threatened species) and the utilisation of the reserve by these species as part of a regional corridor system	Research undertaken	3.4	Medium
	Develop a long-term fauna survey program targeting threatened species and species of regional significance	Long term survey sites identified	3.4	Medium

	<p>Update the NPWS regional pest management strategy, including feral animal control strategies for the Nature Reserve, in consultation with the SCA and with reference to the overarching Special Areas pest and weed management plan</p>	<p>Regional pest management strategy updated</p>	<p><b>4.3</b></p>	<p>Medium</p>
	<p>Establish a long-term monitoring program of feral animal populations within the Nature Reserve</p>	<p>No new feral animal species on the Nature Reserve</p>	<p><b>4.3</b></p>	<p>Medium</p>
	<p>Maintain fencing to manage feral animals and reduce the impact of human dumping of animals adjacent to the Nature Reserve.</p>	<p>Fence maintained</p>	<p><b>4.3</b></p>	<p>High</p>
	<p>Research and develop methods to assist native animals move between the Nature Reserve and other areas of vegetation whilst restricting access to humans and feral animals</p>	<p>Methods assisting fauna movement researched and developed</p>	<p><b>3.5</b></p>	<p>Medium</p>
	<p>Interact with other relevant organisations and neighbours to establish vegetation linkages</p>	<p>No performance indicator</p>	<p><b>3.5</b></p>	<p>Medium</p>
<p>To protect Aboriginal cultural heritage values and support the involvement of the local Aboriginal community in reserve management</p>	<p>Undertake a site survey and assessment of the Aboriginal cultural values of the Nature Reserve and record any Aboriginal sites and/ or places into the NSW NPWS Aboriginal Heritage Information Management System</p>	<p>Survey and assessment conducted and sites recorded</p>	<p><b>3.6</b></p>	<p>High</p>
	<p>Conduct Aboriginal heritage assessment in consultation with the Darug people and the Deerubbin Local Aboriginal Land Council before conducting any works involving ground disturbance and protect any sites found</p>	<p>Aboriginal assessments undertaken before all ground works</p>	<p><b>3.6</b></p>	<p>High</p>
	<p>Manage Aboriginal sites and places in consultation with the Darug Aboriginal community and the Deerubbin Local Aboriginal Land Council</p>	<p>Aboriginal groups consulted</p>	<p><b>3.6</b></p>	<p>High</p>

	<p>Manage cultural visitation and research by Aboriginal communities in consultation with the Darug people and the Deerrubbin Local Aboriginal Land Council and in compliance with the SCA's access policies and protocols</p> <p>Pursue opportunities to involve and employ Darug and other Aboriginal people in reserve management, to collect history and record stories of the reserve's significance, and to research and monitor cultural heritage. Any activities involving access to the reserve are to be in compliance with the SCA's access policies and protocols</p>	<p>Aboriginal groups consulted and access complies with SCA access requirements</p> <p>Aboriginal people involved and employed in reserve management programs</p>	<p><b>3.6</b></p> <p><b>3.6</b></p>	High
To conserve significant European heritage	<p>Encourage a heritage survey and research into the history of the Nature Reserve</p> <p>Retain old fence posts and undertake an assessment of their cultural heritage value</p>	<p>Survey conducted</p> <p>Assessment undertaken</p>	<p><b>3.7</b></p> <p><b>3.7</b></p>	<p>Low</p> <p>Low</p>
To control public access to protect water quality and biodiversity	Prohibit public access to the Nature Reserve	Public access prohibited	<b>4.5</b>	High
	Keep the gates in the perimeter fence locked at all times and only open them for authorised personnel	Gates are kept locked	<b>4.5</b>	High
	Continue compliance monitoring adjacent to and within the Nature Reserve	Records of compliance monitoring maintained	<b>4.5</b>	High
	Investigate the need for and undertake installation of new fencing to improve security and to manage access where appropriate	Determination as to whether replacement fencing is required	<b>4.5</b>	High
	Erect regulatory signs at strategic sites along the perimeter fence explaining why the reserve is not accessible to the public	Regulatory signs erected	<b>4.5</b>	High

	<p>Conduct regular inspections of the fence to check for damage and breaches and report to SCA for repair</p> <p>Liaise with Western Sydney Parklands Trust, neighbouring major recreational facility providers and any current and future neighbouring landholders regarding measures to prevent illegal entry to the Nature Reserve</p> <p>SCA and NPWS will develop site-specific access and maintenance agreements with utilities, emergency services and other authorised user groups</p> <p>Authorities requiring access to Prospect Nature Reserve will require approval from the SCA. The SCA will advise the NPWS of any requests for entry</p>	<p>Records of inspections and maintenance retained, damage reported</p> <p>Records of correspondence and meetings maintained</p> <p>Agreements in place</p> <p>Access approval obtained via SCA; NPWS informed of access requests</p> <p>Compliance with agreement</p> <p>Management requirements for tracks reviewed; all tracks necessary for management and essential services are adequately maintained</p>	<p><b>4.5</b></p> <p><b>4.5</b></p> <p><b>7.0</b></p> <p><b>7.0</b></p> <p><b>7.0</b></p> <p><b>7.0</b></p>	<p>High</p> <p>Medium</p> <p>High</p> <p>High</p> <p>Medium</p> <p>Medium</p>
<p>To ensure utilities and tracks are effectively managed</p>	<p>Annual audits of maintenance activities will be undertaken to ensure they are consistent with utility authority agreements and that maintenance activities have minimal environmental impact. Copies of such audits will be provided to the SCA</p> <p>Review the management requirements for individual tracks, and maintain to appropriate standards all tracks necessary for essential services and management purposes</p>			

	Existing interests, including easements, to be managed in accordance with existing management provisions. Any new easements or interests to be negotiated with NPWS and the SCA and have regard to the status of the land as a Nature Reserve and Special Area	Existing easements managed based on existing management provisions.	<b>7.0</b>	Medium
To protect the Nature Reserve and adjacent areas from bushfire	Implement the Prospect Nature Reserve Fire Management Strategy	Reserve protected from uncontrolled bushfire	<b>4.4</b>	High
	Review and revise annual fire management works program on an annual basis, with input from the SCA to ensure water quality is protected	Evidence of upgraded program available annually	<b>4.4</b>	High
	Manage vegetation having regard to water quality protection and ecological responses to fire	Vegetation management actions take into account water quality and fire responses	<b>4.4</b>	Medium
	Maintain all Asset Protection Zones to ensure water quality is not compromised by fire	Water quality protected from uncontrolled bushfire	<b>4.4</b>	High
	Periodically review the Prospect Nature Reserve Fire Management Strategy in consultation with the SCA and update as necessary	Fire Management Strategy reviewed	<b>4.4</b>	High
	Support Darug people in the implementation of traditional Aboriginal fire management practices where the traditional knowledge and understanding is available, consistent with the reserve's fire management strategy	Traditional fire management practices recorded and implemented consistent with the fire management strategy	<b>4.4</b>	Low

To encourage appropriate scientific research	Encourage use of Prospect Nature Reserve for appropriate research which assists in managing water quality and ecological integrity with SCA approval	Research which assists water quality and ecological integrity is encouraged	6.0	Medium
	Give priority to research which will improve the management of the Nature Reserve	Research prioritised	6.0	Medium
	All research to be subject to SCA's access and research policies and the management authority's policies and procedures in relation to permits, licences, conduct of research and production of results	Research conforms with access, policies and other procedural requirements	6.0	High
	Any research into Aboriginal sites or places will be conducted in consultation with the Deerubbin Aboriginal Land Council, Darug people, and the SCA	Relevant organisations consulted	6.0	Medium
	Prepare a prospectus as a guide to preferred research projects in the Nature Reserve and circulate to relevant tertiary institutions	Research prospectus prepared and circulated	6.0	Low
	Seek to have the land use zoning applied to the Prospect Nature Reserve under any relevant planning instrument reflect its status as land reserved under the National Parks and Wildlife Act	Amendments to planning instruments sought	3.1	Medium
	Work with the Western Sydney Parklands Trust and their lessees to promote sympathetic land uses and activities in the vicinity of the Nature Reserve	Ongoing relationships developed with the Western Sydney Parklands Trust and relevant lessees	3.1	Medium
	Develop linkages with adjoining councils to promote sympathetic land uses in the vicinity of the Nature Reserve	No performance indicator	3.1	Low
To ensure land-use planning controls support the values of the Nature Reserve				

To promote awareness of the values of the Nature Reserve to the community	In consultation with the SWC and SCA, place interpretative signage at strategic locations in the adjoining SWC recreation area	Interpretive signage in place	<b>5.0</b>	High
	Develop a joint education plan with the SCA, SWC and neighbours such as Western Sydney Parklands Trust, with input sought from Darug descendants and the Deerubbin Local Aboriginal Land Council.	Education plan developed	<b>5.0</b>	Medium
	Ensure any access for educational purposes is in compliance with SCA's access policy and protocols.	Access in conformity with SCA policy	<b>5.0</b>	Medium
To successfully implement the plan	Undertake an annual review and report progress in implementing this plan of management	Annual review undertaken	<b>8.0</b>	High
	After five years, assess how effectively the Prospect Nature Reserve has been managed in accordance with this plan and how successfully the plan's objectives and desired outcomes have been achieved. This assessment should take into account the results of the monitoring programs set out in this plan and any others that may be developed	5-year review undertaken	<b>8.0</b>	High

## REFERENCES

Bannerman S M and Hazleton P A (1990) *Soil Landscapes of the Penrith 1:100 000 Sheet*, Soil Conservation Service of NSW, Sydney

Benson D H (1992) *Natural Vegetation of the Penrith 1:100,000 Map Sheet Cunninghamia* 2(4): 541-596

Blacktown City Council (undated) *Draft Blacktown City Council Vegetation Management Plan* Blacktown City Council, Blacktown

Brayshaw, H. and White, E. (1999) *Western Sydney Orbital EIS Prestons to Cecil Park Aboriginal Archaeology*. Helen Brayshaw Heritage Consultants Report to the RTA through PPK Environment and Infrastructure Pty Ltd.

Cumberland Zone Bush Fire Management Committee (2010) *Cumberland Zone Bush Fire Risk Management Plan*. Rural Fire Service, Sydney

DEC (Department of Environment and Conservation (NSW)) (2005). *Recovering bushland on the Cumberland Plain: Best practice guidelines for the management and restoration of bushland*. DEC (NSW), Sydney.

DECCW (Department of Environment, Climate Change and Water (NSW)) (2010). *Cumberland Plain Recovery Plan*, Department of Environment, Climate Change and Water (NSW), Sydney.

DIPNR (Department of Infrastructure, Planning and Natural Resources) (2003). *Bring the Bush Back to Western Sydney: Best Practice Guidelines for Bush Regeneration on the Cumberland Plain*. DIPNR, Parramatta

Department of Planning (2005) *Western Sydney Parklands Supporting Environmental Information*. NSW Government Department of Planning and Landcom.

Electricity Association of NSW (1994) *Procedures for power line maintenance in lands administered by the National Parks and Wildlife Service of NSW* Power Lines in National Parks Working Group

Greening Australia (NSW) Inc (1999) *Management Principles to Guide the Restoration and Rehabilitation of Indigenous Vegetation* Technical Sub-committee, Greening Australia (NSW) Inc, Sydney

Integral Energy (1999) *Environmental Management Standard – Environmentally Sensitive Land – Document No. EMS 00010* Integral Energy, Huntingwood

Integral Energy (2000) *Environmental Management Standard – Vegetation Management – Document No. EMS 0004* Integral Energy, Huntingwood

Mills, R. (1999) *Archaeological survey of the proposed Western Sydney Orbital from West Baulkham Hills to Cecil Park - Part B: Indigenous Heritage*. Report to Sinclair Knight Merz on behalf of the RTA.



Molino Stewart (2001) *Background report to the preparation of a Plan of Management for Prospect Nature Reserve* Molino Stewart Pty Ltd, Parramatta

NPWS (National Parks and Wildlife Service) (1997) *Urban Bushland Biodiversity Survey, Western Sydney* NSW National Parks and Wildlife Service, Sydney

NPWS (2000) *Interpretation Guidelines for the Native Vegetation Maps of the Cumberland Plain, Western Sydney and accompanying maps of Native Vegetation of the Cumberland Plain* (Map 12) NSW National Parks and Wildlife Service, Sydney

NPWS (2001) *Endangered Ecological Community Information – Cumberland Plain Woodland* NSW National Parks and Wildlife Service, Sydney

NPWS (2009) *Prospect Fire Management Strategy*. NSW Department of Environment and Climate Change, Sydney

Oculus Environmental Planning, Land & Environment Planning and ESP Consultants (1999) *Green Corridors Management Strategy*. Prepared for the Upper Parramatta River Catchment Trust

Stevens, A. and McDonald, J. (2006) *Aboriginal Archaeological Assessment: Western Sydney Parklands – Phase I, Bungarribee Precinct and Interface lands*. Report prepared by Jo McDonald Cultural Heritage Management Pty Ltd for APP on behalf of Landcom and Department of Planning. (draft)

Sydney Catchment Authority (2005). *Water Quality Risk Management Framework*.

SCA & DEC (2007) *Special Areas Strategic Plan of Management*. Sydney Catchment Authority and Department of Environment and Conservation.

Sydney Water Corporation and NSW National Parks and Wildlife Service (1999) *Memorandum of Understanding, being an interim agreement on the management of bushland surrounding the northern edge of the Prospect Reservoir* (16 March 1999)

Thomas D (1993) *Prospect Reservoir Land Use and Environmental Management Plan* Sydney Water Board

Thomas J (1994) *Effects of Hazard Reduction Burning on grassy woodland Remnants in Western Sydney*. Msc. Thesis University of NSW

WSPT (2009) *Western Sydney Parklands Bushfire Management Strategy and Implementation Program*. Western Sydney Parklands Trust (NSW), Sydney

WSPT (2011) *Western Sydney Parklands Plan of Management 2020*. Western Sydney Parklands Trust, Sydney.





