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GOOGONG FORESHORES

PLAN OF MANAGEMENT

2010

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- Consultants' reports covering environmental assessment, site contamination, heritage assessment and heritage management, prepared for the Commonwealth Department of Finance and Deregulation.

The final plan was prepared by Dr Kevin Frawley in association with Conservation Planning and Research, in the Land Management and Planning Division, ACT Department of Territory and Municipal Services.

Ministerial Foreword

Googong Foreshores is managed by the ACT Government on behalf of the Commonwealth and has an important role to play in protecting the quality of part of the water supply for Canberra and Queanbeyan. Googong Reservoir is the largest of the ACT's water storages and since the 2003 bushfire it has taken on an enhanced role. Googong Foreshores also contains significant natural and cultural heritage features which require protection. The area is valued by the people of Canberra and Queanbeyan for its recreational opportunities.

The Googong Foreshores Plan of Management establishes a management framework aimed at ensuring that the area's water supply purpose is safeguarded. Preparation of such a plan is also a condition of the 150 year lease (2008) by the Commonwealth to the ACT Government for management of the area.

Googong Foreshores has a history similar to much of the ACT. The evidence indicates that Aboriginal people occupied the area from about 25 000 years ago and favoured campsites along the river valleys. European pastoralists arrived from the 1820s and changed the landscape by clearing vegetation and constructing buildings. The London Bridge Homestead is a rare example of an early homestead and contains progressive additions over a period from about 1870 to 1950. The homestead has recognised cultural heritage value.

The natural environment of Googong Foreshores is also important. It forms part of a corridor of relatively intact natural vegetation extending from the north-east of the ACT to the Tinderry Range, south of the Foreshores. The area contains remnants of lowland grassy ecosystems, dry forests, and a number of threatened plant and animal species which require special management consideration. The area also contains a significant geological feature, London Bridge Arch, which is a major visitor attraction.

Recreational activities within Googong Foreshores will necessarily be restricted to those that are compatible with the primary purpose of the area as water supply. They include fishing, picnicking, bushwalking, mountain biking, canoeing and nature-based activities such as bird watching.

Land managers must have in place appropriate policies and actions to address visitor use of Googong Foreshores for recreation and enjoyment. This plan puts forward a management approach that allows multiple use of the Foreshores for recreation, education and research, whilst ensuring that water quality is protected.

Jon Stanhope, MLA
Minister for Territory and Municipal Services

Preface

This management plan has been prepared by the ACT Government (Department of Territory and Municipal Services) to guide the management of the Googong Dam Area (commonly referred to as 'Googong Foreshores' or 'the Foreshores'). The plan addresses the management of access to, and activities undertaken at the Foreshores, except those specifically associated with water supply infrastructure.

The construction of Googong Dam was completed in 1977 and the reservoir filled in 1978. Since that time several operational plans have been prepared for managing the Foreshores, but there has been no comprehensive management plan. Due to the unusual legal status of the Googong Dam Area, there is no *specific* statutory requirement or basis for the preparation of a management plan. However, a management plan provides the most effective means to set out how Googong Foreshores will be managed in relation to the ACT Government's duty of environmental protection prescribed in the *Canberra Water Supply (Googong Dam) Act 1974*.

A number of factors prompted the development of a management plan, in particular:

- the revised role of Googong Reservoir as a water storage for the ACT urban water supply
- more stringent management of the risks to potable water quality globally
- increased development pressures on land adjoining the Foreshores
- the need for a sound scientifically based approach to wildlife management and policies for the protection of the significant natural and cultural values of the area.

In 2008, as owner of the Googong Dam Area, the Commonwealth Government leased the premises (being the land and improvements) to the ACT Government for a period of 150 years. A condition of the lease is the preparation of a Land and Conservation Management Plan (see Appendix 1). It is intended that this management plan serve that purpose.

The management plan is based on a draft plan released for public comment in September 2007. Finalisation of the plan has involved consideration of submissions on the draft and the addition of material related to the lease of the area by the Commonwealth to the ACT Government. Development of the management plan involved extensive consultation with users of the Foreshores, interest groups, government agencies, ACTEW Corporation and ActewAGL (the ACT's water utility).

Management of the water supply (i.e. the conversion of raw water in the reservoir to potable water that is reticulated to Canberra and Queanbeyan) is not covered in this plan, as use of the water stored in the reservoir, the establishment and maintenance of water supply infrastructure and associated land, and the operation of Googong Dam are the responsibility of ACTEW Corporation and ActewAGL.

The central focus of this management plan is the management of activities in the Googong Foreshores to ensure that they do not impact adversely on the area's primary purpose of providing high quality raw water for potable water supply.

Vision

Googong Foreshores is an attractive and biologically diverse area that provides a source for high quality potable water, protects natural and cultural heritage, and is valued for its recreational opportunities.

Chapter 1 Introduction

1.1 Googong Foreshores

Googong Foreshores is located in New South Wales, to the south-east of the ACT and 13 km by road from Queanbeyan. Here, the waters of the Queanbeyan River and its tributaries are impounded by the Googong Dam to form a linear tapering reservoir. The Googong Foreshores area encompasses Googong Dam, a short section of the Queanbeyan River below the dam, the reservoir, land either side of the reservoir, and further south, land either side of the Queanbeyan River and Burra Creek (Figure 1.1). It is the land defined in the *Canberra Water Supply (Googong Dam) Act 1974* as the Googong Dam Area (Dam Area/Area). The Commonwealth Government acquired this Area (5089 hectares) from New South Wales in 1973 for the purpose of constructing the dam. Most of the catchment remains under the control of New South Wales.

The primary purpose of the reservoir is the provision of high quality raw water for the supply of potable water to the Australian Capital Territory and Queanbeyan. Other important values of the area are natural and cultural heritage, recreation, and education and research. Recreation, in particular, must be carefully managed to ensure compatibility with the main water supply purpose.

1.2 Purpose and Scope of the Management Plan

This management plan has been prepared for the Googong Foreshores, which is managed by ACT Government agencies on behalf of the Australian Capital Territory Executive. The water supply infrastructure at Googong is owned by ACTEW Corporation and managed by ActewAGL (50 per cent owned by ACTEW). The ACT Government regulates ACTEW Corporation in regard to: (a) taking water from the reservoir; and (b) the provision of environmental flow releases from the dam. Through the Commonwealth's *Canberra Water Supply (Googong Dam) Act 1974* (Googong Dam Act), control over water supply and management of the Googong Dam Area (defined in s. 1.4.1) was vested in the Territory Executive, acting on behalf of the Commonwealth, following ACT self-government in 1988. It should be noted that Googong Foreshores is *not* a reserve declared under legislation, nor is there a current *specific* statutory requirement or basis for the preparation of a management plan. However, a management plan provides the most effective means to set out how the Foreshores will be managed in relation to the ACT Government's duty of environmental protection prescribed in the Googong Dam Act.

In 2008, ACT control over the Googong Dam area was formalised in a lease between the Commonwealth and ACT governments (Googong Lease/Lease) (see s. 1.4.1). It is intended that this management plan fulfils the requirement under the Lease for the preparation of a Land and Conservation Management Plan (clause 5.1(a) (ii)). Other plans required by the Lease are a Dam Safety Management Plan, Protection of Critical Infrastructure Plan, and a Heritage Management Plan (clause 5.1(a)) (Commonwealth of Australia 2008).

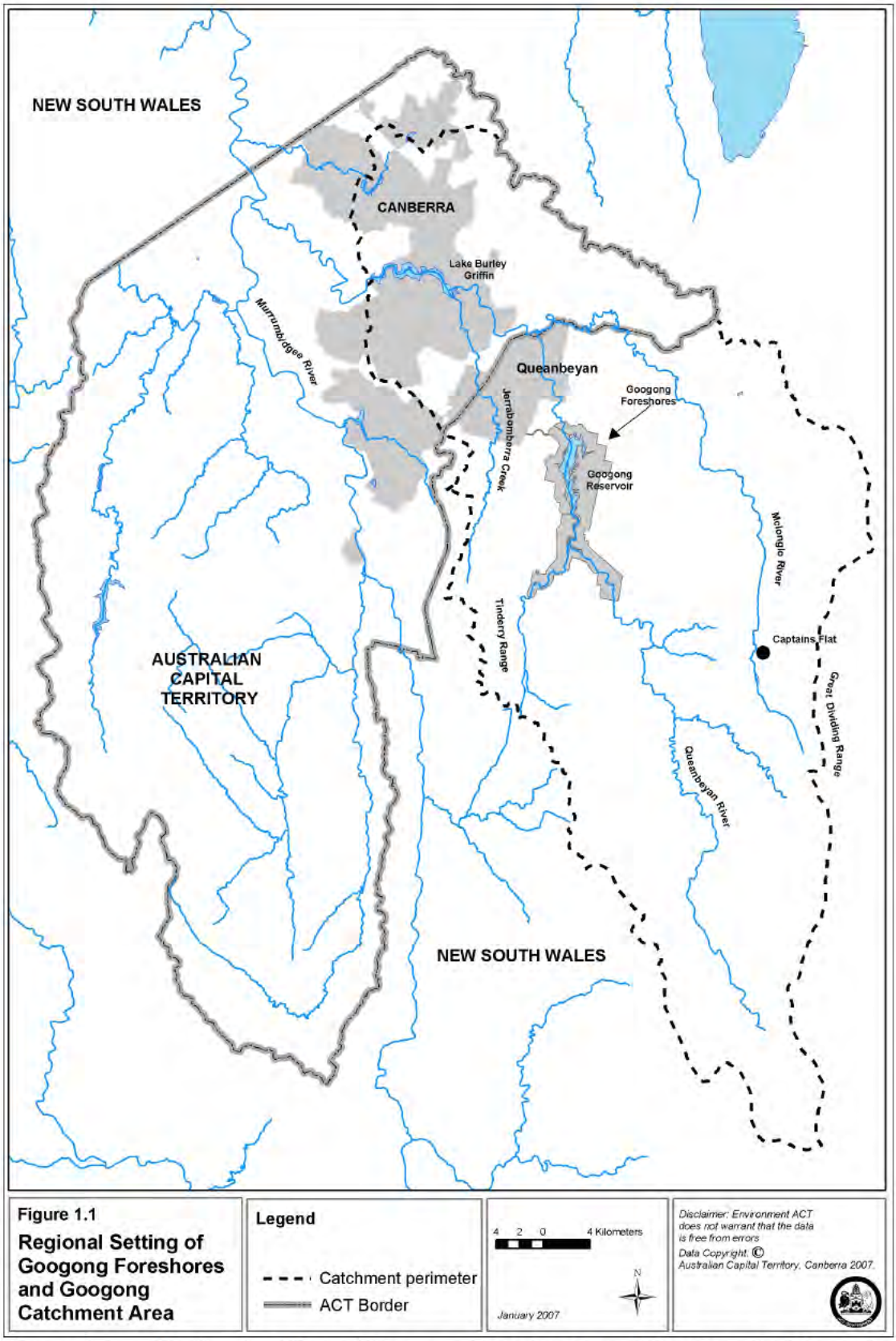

Figure 1.1 Regional setting of Googong Foreshores and Googong Catchment area

The central focus of the management plan is the management of activities in Googong Foreshores to ensure that they do not impact adversely on the area's primary purpose of providing high quality raw water for potable water supply. The plan also aims to provide clear management directions for the area, and guidance for the responsible land management agencies within ACT Government. The management plan is also relevant to the activities of ACTEW Corporation, New South Wales Government agencies with responsibilities in the area, local government, and the community in general. Some aspects of management require more detailed prescriptions and operational procedures than can be included in a management plan. These will be based on those currently in place or will be prepared as required.

The scope of this plan is limited to the *management* of the area contained within the Googong Dam Area (see s. 1.4.1). Consistent with the ACT Executive's functions and powers under the Googong Dam Act, it describes how the ACT Government will manage the area, apart from the dam, treatment plant and pipeline infrastructure for which ACTEW Corporation is responsible. The plan is not a management plan for the remainder of the Googong Catchment, which is the responsibility of the New South Wales Government, including local government.

1.3 Significance of Googong Foreshores

Googong Foreshores is a valuable regional asset and is an example of successful multiple use management of a domestic water supply reservoir and its surrounds. The reservoir is the largest within the ACT domestic water supply system and has taken on an enhanced role in assuring the ACT urban water supply in the wake of the 2003 bushfire. The area is popular for recreation, especially fishing, as well as picnicking, bushwalking, mountain biking, canoeing, and nature-based activities, such as bird watching. The waters of the reservoir are a scenic attraction and backdrop to many recreational activities. The area contains important cultural heritage. There is evidence of Aboriginal occupation of the valley, while the London Bridge Homestead on Burra Creek dates from the 1860s. The biodiversity value (see **Glossary**) of the area has been increasingly recognised. Googong Foreshores forms part of a corridor of relatively intact vegetation from the Tinderry Range in the south, to Greenwood Hill in the north-eastern ACT, as well as contributing to east-west links. This ecological connectivity is likely to assume increasing importance in the face of climate change. The Foreshores contains a number of threatened species and ecological communities.

1.4 Legislation and Policy

The Googong Dam Area is land in New South Wales, acquired by the Commonwealth Government, and managed by the ACT Government (on behalf of the Commonwealth). In this context the application of particular legislation may be complex. This section outlines the most important legislation and its application. As this plan cannot cover all eventualities, if there is any doubt about the applicability and enforcement of legislation, legal advice should be sought.

Three levels of government are involved with the Googong Foreshores with corresponding application of legislation:

(a) Commonwealth
(b) Territory (ACT) and state (New South Wales)
(c) NSW local government (the area is within the Palerang Council and on the western boundary, borders the Queanbeyan City Council).

As the Googong Dam Area is a Commonwealth Place in New South Wales, relevant Commonwealth and New South Wales legislation applies. The operation of the *Commonwealth Places (Application of Laws) Act 1970* and section 11 of the *Canberra Water Supply (Googong Dam) Act 1974* determine which New South Wales law applies to the area. Commonwealth legislation takes precedence over all other legislation (for practical purposes mostly New South Wales state and local government legislation) unless the other legislation is capable of operating concurrently with Commonwealth legislation. To the extent that any other legislation that appears to apply to the Googong Dam Area is not capable of operating concurrently with Commonwealth legislation, that other legislation has no operation. ACT legislation has only minimal operation in the Googong Dam Area (see s. 1.4.4).

1.4.1 Ownership and Control

The Googong Dam Area is owned by the Commonwealth. The land was compulsorily acquired from New South Wales under the *Lands Acquisition Act 1989* (Cwlth). As land acquired by the Commonwealth, it remains part of New South Wales (unlike a 'territory' such as Jervis Bay, the ACT or the Northern Territory, which are not part of any state). New South Wales laws apply where they are capable of operating concurrently with the Googong Dam Act (s. 27) and other Commonwealth law (section 109 Constitution). However, Commonwealth laws have superiority over inconsistent state laws.

New South Wales laws that operate in the Dam Area cannot restrict or impede the ACT in carrying out its functions under the Googong Dam Act because, in attempting to do so, they would be inconsistent with that Act. The ACT Government has no general power to legislate in respect of the Googong Dam Area, and is only able to legislate in relation to the manner in which the ACT Executive exercises its powers and performs its functions and duties (Googong Dam Act (s. 6A)). Although the *Water Resources Act 1998* (ACT) does not operate as a law regulating the control of water in the Googong Dam Area, the Territory carries out some of its responsibilities under the Googong Dam Act in accordance with that Act, in particular, the regulation of ACTEW Corporation in taking the water and specification of environmental flow guidelines (s. 1.4.4).

The Googong Lease (2008), between the Commonwealth of Australia and the Australian Capital Territory, is for a period of 150 years (Commonwealth of Australia 2008). The Lease covers the land (including reservoir waters) and improvements (all water supply infrastructure i.e. the dam wall, spillway, water treatment plant, pipelines, and all other property including fences, plant, equipment, fixtures). The ACT Government sub-leases the water supply infrastructure to ACTEW Corporation. The Googong Lease specifically provides for the grant of such a sub-lease to ACTEW without prior consent of the Commonwealth. Any other sub-lease in the Area requires the prior written consent of the Commonwealth. No other sub-leases currently exist at Googong Foreshores, nor are any proposed in this management plan.

The Googong Lease prescribes permitted use of the Googong Dam Area (Appendix 2). It also provides for the continuation of the *Queanbeyan Water Supply Agreement*, which is an agreement between the Commonwealth, ACT and NSW for the supply of water to the Queanbeyan City Local Government Area.

1.4.2 Commonwealth Legislation

Commonwealth legislation of particular relevance to the Googong Dam Area relates to the establishment of the ACT and the securing of its water supply; planning for the

national capital; environmental protection, biodiversity and heritage conservation; and water management.

Seat of Government Acceptance Act 1909

The origins of the Googong Dam derive from the *Seat of Government Acceptance Act 1909*, which gives the Commonwealth paramount rights to the waters of the Queanbeyan and Molonglo rivers for all the purposes of the Australian Capital Territory. Under the Act, New South Wales is obligated to not pollute and to protect from pollution the waters of the Queanbeyan River for its whole course above the Territory. While the waters of these rivers have long been used for a variety of ACT purposes, the Googong Dam Act (see below) specifically addresses the use of the waters collected in the Googong Dam Area for urban water supply.

Canberra Water Supply (Googong Dam) Act 1974

The Googong Dam Act is the main source of functions and powers for the Territory. The powers and functions are exercisable by the ACT Executive. However, the Act only gives some limited functions to the Executive. The Executive is to perform its functions on behalf of the Commonwealth. The powers and functions detailed below are the legislative basis upon which the Territory manages the Googong Foreshores.

The functions given by the Act are to carry out the planning and provision of a dam, pipelines and other works and facilities for:

(a) the collection, diversion and storage of water in the Googong Dam Area
(b) the conveyance and supply of water from that Area for use in the Territory or such other place that the Commonwealth Minister agrees in accordance with the Act
(c) the treatment and purification of water supplied or to be supplied from that Area
(d) the prevention of the pollution of water supplied or to be supplied from that Area.

The Act also provides for works and facilities for the accommodation in the Googong Dam Area of persons employed by the Territory or by a Territory authority in connexion with the protection or regulation of that Area or with the operation and maintenance of any such dam, pipelines, works or facilities in that Area (section 4, Googong Dam Act).

Section 5 of the Googong Dam Act sets out the powers of the ACT Executive in performing its functions under section 4 of the Act. The Executive has power to do, in the Territory or elsewhere, all things necessary or convenient to be done for or in connexion with, or as incidental to, the performance of its functions under the Act. Section 5 also sets out some specific powers such as to construct works that are in the opinion of the Executive, necessary or desirable for the purpose of preventing or mitigating injurious effects of other works constructed in accordance with the Act. Other specific powers include power to enter into agreements with other persons for work to be performed in the Googong Dam Area.

The Googong Dam Act (section 6) sets out the duty of the ACT Executive. That duty is to ensure that the effect on the environment of anything done or proposed to be done in the performance of its functions or the exercise of its powers under that Act is fully considered and that all reasonably practicable measures are taken for the protection of the environment.

Section 6A of the Googong Dam Act requires the ACT Executive to exercise its powers and perform its functions and duties in accordance with any conditions determined in writing by the Commonwealth Minister after consultation with the Executive and any law made by the ACT Legislative Assembly. At the time of writing this plan of management, the Commonwealth Minister had not determined any conditions and the Assembly had not passed any laws under this provision. Consideration will need to be given from time to time as to whether the Minister has determined any conditions, or the Assembly has passed any law, and action taken to ensure compliance with the condition or law.

The Googong Dam Act (section 17) also provides for the Executive to have a power to declare, by notice in the ACT Gazette, a specified area, including an area of water, to be an area to which access by the public is permitted.

In accordance with section 12 of the Act, the Commonwealth Minister has approved the supply of water from Googong Reservoir to the ACT/NSW cross border region. Relevant agreements between the Commonwealth, Australian Capital Territory and New South Wales are:

- the Memorandum of Understanding on Cross Border Water Resources (2006)
- the Queanbeyan Water Supply Agreement (2008).

Australian Capital Territory (Planning and Land Management) Act 1988

The *Australian Capital Territory (Planning and Land Management) Act 1988* established the National Capital Planning Authority (later the National Capital Authority), one of whose functions is to prepare and administer a National Capital Plan. The plan (Appendix J) contains technical and management guidelines for Lake Burley Griffin that include operating criteria for Scrivener and Googong dams. In particular, the guideline for operating Googong Dam specifies flow releases to maintain the water level in the lake, except during periods of water restrictions in Canberra.

Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the primary Commonwealth environmental legislation. The Act provides the legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the Act as 'matters of national environmental significance'. The Act also prescribes more general environmental responsibilities in relation to actions undertaken on Commonwealth land or by Commonwealth agencies that are likely to have a significant impact on the environment. The Act provides for the establishment of a list of National Heritage Places (a matter of national environmental significance) and a Commonwealth Heritage List. The latter contains places on Commonwealth land that are assessed as being significant at a local, state or national level for one or more of an established set of criteria. A consolidated list of places on statutory heritage registers in Australia (including the Commonwealth Heritage List) can be found at <http://www.environment.gov.au/heritage/index.html>.

The main provisions of the EPBC Act applying to Googong Foreshores concern: (a) nationally threatened species and ecological communities, and listed migratory species (matters of national environmental significance); (b) actions undertaken on Commonwealth Land and by Commonwealth agencies; and (c) establishment of a Commonwealth Heritage List. For each of the above, approval from the Commonwealth Environment Minister is required if proposed actions are likely to cause a significant impact on the environment. Australian Government agencies are required to develop a

management plan for places on the Commonwealth Heritage List, for which they have responsibility. The Googong Lease (clause 4.2) specifies referral requirements to the Commonwealth Environment Minister for any proposal to use the Area for a purpose other than those specified in the lease, and with regard to any proposed action that may have an impact on the environment.

National Environment Protection Measures (Implementation) Act 1998
National Environment Protection Measures (NEPMs) outline national objectives for protecting or managing particular aspects of the environment (e.g. air quality, assessment of site contamination) and are established under the *National Environment Protection Council Act 1994*. A list of current NEPMs is at <http://ephc.gov.au/nepms>. NEPMs are established through the Environment Protection and Heritage Council (incorporating the National Environment Protection Council), an intergovernmental council of environment ministers. NEPMs are implemented through legislation in each of the participating jurisdictions.

State and territory laws implementing NEPMs do not apply to the activities of the Commonwealth or Commonwealth authorities. The purpose of the *National Environment Protection Measures (Implementation) Act 1998* is to give effect to NEPMs in relation to the activities of the Commonwealth or Commonwealth authorities, in both Commonwealth and other places, by applying state or territory laws, by regulations, or by environmental audits and environmental management plans. NEPMs particularly relevant to Googong Foreshores are those covering site contamination and pollution e.g. *NEPM: Assessment of Site Contamination – Dec 1999* and associated schedules.

Water Act 2007
The *Water Act 2007* (Water Act) implements key reforms for water management in Australia. The Act was amended by the *Water Amendment Act 2008* to give effect to the *Intergovernmental Agreement on Murray–Darling Basin Reform* agreed to at the July 2008 Council of Australian Governments meeting. Googong Dam, located in the upper Murrumbidgee River Catchment is part of the Murray–Darling Basin, for which the newly established Murray–Darling Basin Authority is required to prepare and implement a strategic plan for integrated and sustainable management of the water resources. This is referred to as the Basin Plan, which will include (amongst other requirements): specification of limits on the amount of water that can be taken from basin water resources; identification of risks to basin water resources and strategies to manage risk; a water quality and salinity management plan; and determination of the critical human water needs of communities dependent on basin water resources. The Basin Plan will also include the identification of water resource plan areas (section 22, Water Act) for which water resource plans are to be prepared (section 19, Water Act). Requirements under the Act and the Basin Plan will directly affect future management of the water resources of the Googong Dam Area.

1.4.3 New South Wales Legislation

All New South Wales legislation, unless inconsistent with Commonwealth legislation, applies to the Googong Dam Area. On a day-to-day basis, this legislation effectively provides the main legislative framework for the area and the activities that occur there. Following the passage of the Googong Dam Act in 1974, New South Wales enacted the *Googong Dam Catchment Area Act 1975* providing for the declaration of a catchment area for the dam and for the making of regulations for catchment protection.

From the perspective of managing the Googong Foreshores (as well as the larger catchment), the most important legislation is that referring to land management, catchment management, water quality, pollution, planning, local government, threatened species and ecological communities, fisheries and waterways. The following legislation is of particular relevance:

- *Catchment Management Authorities Act 2003*
- *Crown Lands Act 1989*
- *Dams Safety Act 1978*
- *Environmental Planning and Assessment Act 1979*
- *Fisheries Management Act 1994*
- *Heritage Act 1977*
- *Local Government Act 1993*
- *Marine Safety Act 1998*
- *National Parks and Wildlife Act 1974*
- *Noxious Weeds Act 1993*
- *Pesticides Act 1999*
- *Protection of the Environment Operations Act 1997*
- *Public Health Act 1991*
- *Rural Fires Act 1997*
- *Rural Lands Protection Act 1998*
- *Threatened Species Conservation Act 1995*
- *Water Management Act 2000.*

The Googong Dam Area is a declared Wildlife Refuge under the *National Parks and Wildlife Service ACT 1974*. The Wildlife Refuges scheme provides support to private and public land owners and managers to protect and conserve native wildlife. The scheme is voluntary and is managed by the NSW Department of Environment, Climate Change and Water.

While the ACT Government manages Googong Foreshores, enforcement of New South Wales law (e.g. legislation covering fishing and boating, environmental protection, bushfire control) is carried out by NSW Government agencies. Through their day-to-day management activities, ACT Government employees administer the provisions of relevant NSW legislation but without enforcement powers. It is likely that use pressures will increase on Googong and the day-to-day enforcement of NSW legislation may be difficult, if not impossible, if there are no persons, properly authorised to administer and seek the enforcement of that legislation, present in the Googong Dam Area. If significant offences, contrary to NSW legislation, occur regularly, arrangements will need to be made with NSW authorities for appropriate enforcement mechanisms to be instituted, such as delegations to ACT management staff (see s. 9.4).

1.4.4 ACT Legislation

ACT legislation has a very limited application in the Googong Dam Area. This arises from a number of factors. First, the Googong Dam Area is in NSW and there is a general rule of law that the legislation of a particular jurisdiction (such as the ACT) cannot (except to a limited extent) operate in another jurisdiction. Second, NSW laws operate in the Googong Dam Area to the extent that they are capable of operating concurrently with Commonwealth laws (including the Googong Dam Act) in that Area. Third, ACT legislation has no operation to the extent that is inconsistent with Commonwealth legislation.

ACT legislation that does operate in relation to the Googong Dam Area will be legislation that is not inconsistent with Commonwealth or NSW legislation and that is, by its nature, not referable to the Googong Dam Area in a geographical sense. For example, legislation that regulates the behaviour of ACT public servants, or the procurement of goods and services or the collection of public moneys would apply, even though the public servants are carrying out duties in the Googong Dam Area, the goods and services will be provided for that Area and moneys are collected from activities carried out in the Area. However, any legislation that, by its nature, must operate within the Area itself, if it is to operate at all in relation to the Googong Dam Area, such as the *Nature Conservation Act 1980* and the *Planning and Development Act 2007,* does not have any effect in the Area.

Although ACT legislation has very limited effect in the Googong Dam Area; that is not to say that the Territory is unable to implement policies similar to the policies required under ACT law to manage the Area. However, in doing so it should be noted that such policies must not be inconsistent with any applicable legislation (NSW and Commonwealth) and that the enforcement of ACT policies against individuals will not be possible if the enforcement would seek to rely on the application of ACT legislation in the Area in circumstances in which that legislation does not apply.

1.4.5 NSW Local Government Legislation

Local government legislation relies on NSW legislation for its efficacy. To the extent that local government legislation operates in the Googong Dam Area (for example a local planning document) and is not inconsistent with Commonwealth law (including the Googong Dam Act) it will have effect. Local environment plans (LEPs) prepared by councils and established under the *Environmental Planning and Assessment Act 1979* (NSW) are relevant to the management of the Dam Area. The *Queanbeyan Local Environmental Plan 1998* and *Queanbeyan Local Environmental Plan (Googong) 2009* apply to land adjoining the Area. Queanbeyan City Council is preparing a comprehensive LEP for the whole of its Local Government Area. Palerang Council is developing an LEP for the amalgamated council area formed in 2004; meanwhile the *Yarrowlumla Local Environmental Plan 2002* currently applies to the Area.

1.4.6 Policies, Plans, Strategies and Guidelines

Management of Googong Foreshores is framed within and influenced by a wide range of policies, plans, strategies and guidelines (Appendix 3). Many of these documents provide more detail in relation to management responsibilities outlined in this plan.

Development within the Googong Catchment, including the Foreshores, where not inconsistent with the Commonwealth's *Canberra Water Supply (Googong Dam) Act 1974*, is controlled mainly under the provisions of the *Environmental Planning and Assessment Act 1979* (NSW) and vested with local government especially in the form of Local Environmental Plans. The Queanbeyan River is part of the upper catchment of the Murrumbidgee River and therefore included in the *Murrumbidgee Catchment Action Plan*. This is a statutory document intended to provide direction for future investment in natural resource management in the catchment through education, planning and partnership development (Murrumbidgee Catchment Management Authority 2009).

Some ACT frameworks are used in the management of Googong water resources and Googong Foreshores. The *ACT Environmental Flow Guidelines 2006* (ACT Government 2006) established under the *Water Resources Act 1998* (ACT) specify environmental

flows in New South Wales immediately downstream of Googong Dam as these are under the direct control of the ACT through regulation of releases. The *Fish Stocking Plan for the ACT 2009–2014* (ACT Government 2009) is a coordinated program that includes Googong Reservoir. Stocking of the reservoir is carried out in cooperation with the NSW Department of Primary Industries, which provides the majority of fish stocks.

1.5 Structure of this Management Plan

The following structure has been used in preparing this management plan:

VISION FOR GOOGONG FORESHORES

↓

PRIMARY PURPOSE AND VALUES OF THE GOOGONG FORESHORES
(Water Storage and Supply, Natural Heritage, Cultural Heritage, Recreation, Education and Research)

↓

MANAGEMENT FRAMEWORK

	ENDS	MEANS
GENERAL	(a) Goals (s. 2.7.1) (b) Primary Management Objectives (s. 2.7.2)	Management Policy[1] (Chs 4–10)
SPECIFIC	Detailed Objectives (Chs 4–10)	Management Policy (Chs 4–10) Management Actions/Strategies (Chs 4–10 and Summary Table 10.1)

1 Policies guide decision making and represent a management position with regard to the achievement of objectives. Policies provide a consistent basis to respond to changing circumstances and new issues.

1.6 Review and Reporting

The Googong Foreshores management plan does not have a direct statutory basis i.e. there is no legislation in the ACT that requires the preparation of such a plan. However, as outlined in s. 1.4, there is a wide range of legislation and policy that is relevant to the purpose of the plan and the legislation provides a statutory basis for the policies and actions in the plan. As noted in s. 1.2, it is intended that this management plan fulfils the requirement under the Googong Lease for the preparation of a Land and Conservation Management Plan.

The Googong Lease specifies a number of obligations on the ACT with regard to review and reporting that affect this management plan:

- review of the terms of the lease to update references to laws and documents referred to in the lease or governmental administrative arrangements affecting the operation of the lease (five yearly) (clause 2.3(a))

- following any review, negotiation between the Commonwealth and the ACT to vary the lease to incorporate changes (clause 2.3(b))
- review and update of the Land and Conservation Management Plan (this management plan) (five yearly) (clause 5.1(b) (ii))
- reporting to the Commonwealth of any material breach of the plan (clause 5.1(b) (v))
- referral to the Commonwealth Environment Minister under the EPBC Act (clause 4.2)
- advice to the Commonwealth should contamination be discovered in the Googong Dam Area (clause 6.2(c) (i)).

Chapter 2 Googong Foreshores: Attributes, Values, Management Goals and Objectives

2.1 Physical Features

When full, Googong Reservoir covers approximately 680 ha extending from the dam wall to the vicinity of Compo Canyon on the Queanbeyan River and Drawdown Crossing on Burra Creek. The reservoir is about 1.5 km wide near the dam wall and extends southward for about 11 km. The southern-most 3 km of the reservoir is narrow (250 m or less). The upstream limit of the reservoir is defined by Curleys Falls, a series of small (1 to 3 m) drops through a small rocky gorge.

A feature of the Googong Dam Area is the difference between the eastern and western sides of the reservoir. This is related to the geology of the area, which is dominated by the Queanbeyan Fault. The eastern escarpment is aligned with the fault, and rises to about 950 m ASL with steep local relief. Before being submerged, the Queanbeyan River flowed north along the base of the escarpment towards Queanbeyan after cutting westward through the Cullarin Block and joining Burra Creek. The eastern area is mostly tree-covered, with dry sclerophyll forest that is typical of shallow, rocky and infertile soils on steep hilly country in the NSW southern tablelands. The narrower western area rises to about 750 m ASL and has gentler local relief. This area was formerly in pastoral holdings and was extensively cleared. As well as residual paddock trees and tree plantings, there are now patches of tree regeneration comprising both dry sclerophyll forest and lowland woodland. Extensive remnants of natural temperate grassland occur on this area and along Burra Creek.

2.2 Infrastructure

2.2.1 Water Supply

Water supply infrastructure is concentrated in the north-western part of the Googong Dam Area. It includes the dam, spillway, intake tower, water treatment plant, four pumps to draw water from the dam to the treatment facility, and the bulk supply main to deliver the water to Canberra and Queanbeyan. In 2005 a bypass pipeline was constructed around the Googong water treatment plant to take water from the Cotter Catchment to the Googong Reservoir as part of the *Cotter Googong Bulk Transfer* program. One of ACTEW's major 'water security' projects for the ACT is the *Murrumbidgee to Googong Water Transfer*, which intends to use Googong Reservoir to store water pumped from the Murrumbidgee River and discharged into Burra Creek (see s. 4.2).

2.2.2 Foreshores

Other infrastructure largely relates to the management of the Foreshores, especially the provision of recreation facilities. This includes a ranger station, carparks, picnic facilities (tables, barbecues), toilets, boat ramps and bird hides. The northern access (via Googong Dam Road) is all sealed road. The southern access (London Bridge Road) is only part-sealed. There is a network of vehicle tracks (mostly four wheel drive standard) that are used for management access, as fire trails, and for walking and mountain bike riding. These tracks are closed to public vehicle access. There are also some purpose-built walking tracks unsuitable for vehicles.

2.3 Adjacent Land Uses

Googong Reservoir was established within a mostly pastoral landscape (sheep and cattle grazing), in which there was extensive clearing at lower elevations and in less rugged areas. The most significant land use trends in areas adjacent to Googong Foreshores have been the subdivision of former pastoral holdings for rural residential purposes and the recent establishment of nature reserves on the escarpment country. Subdivided land in the Burra Valley, south-west of the Foreshores, and extending east to Urialla (Urila) directly abuts the Googong Dam Area. Subdivision of this area for rural residential development dates from the 1970s. Urban development is approved for land adjacent to the north-western boundary of the Foreshores. The 'Googong New Town' will contain 5500 homesites mainly south of the Googong Dam Road (Canberra Investment Corporation 2005; Willana Associates 2007). There is no rural residential development directly bordering the rugged eastern boundary of the Googong Dam Area.

Cuumbeun Nature Reserve (709 ha in two parts) and Burra Creek Nature Reserve (NR) (270 ha) were gazetted as part of the (NSW) Southern Regional Forest Agreement in 2001. Cuumbeun NR protects the escarpment country that continues northward from the eastern side of Googong Foreshores (NSW NPWS 2004). Burra Creek NR protects part of the escarpment located south of the confluence of Burra Creek and the Queanbeyan River, and east of London Bridge Homestead.

Many vehicle tracks (fire trails) enter the Googong Dam Area from bordering properties. Locked gates at the boundary prevent unauthorised vehicle access.

2.4 Land Use History

Three major periods are identifiable in the human history of the Googong area: Aboriginal occupation (possibly dating from 25 000 years before present); the European pastoral period (1820s to the present); water supply, recreation, rural residential development, natural and cultural heritage conservation (1970s to present). Some more detailed markers for these periods are shown in Table 2.1.

Table 2.1 Googong Foreshores and surrounding areas: a landscape timeline

Time	Period/Event	Comment
Aboriginal Occupation		
C25 000 years before present	Aboriginal occupation	The earliest known occupation site in the region is from Birrigai, ACT, dated at 21 000 years before present (Flood et al. 1987). River valleys that were not frost hollows were favoured occupation sites in the Southern Tablelands.
1820s onward	Displacement	Aboriginal people were displaced by the European pastoral economy and succumbed to disease e.g. smallpox (1830), influenza and measles (1860s) (Flood 1980; Jackson-Nakano 2001).
1975	Googong dam site archaeological survey	Field survey of the area to be inundated recorded: nine isolated finds of artefacts, two stone cairns, one campsite (Smith 1975 in Flood 1980).
2008	Googong Foreshores Aboriginal heritage assessment	Field survey recorded twelve Aboriginal sites comprising: one campsite, isolated finds, artefact scatters, one scarred tree, one stone cairn (possible burial site), one sacred site (London Bridge Natural Arch) (ERM Australia 2008a).
European Pastoral		
1821/22	European exploration of 'Limestone Plains'	In 1821 Throsby and Wild explored from Lake George, crossing the Limestone Plains to the Murrumbidgee River. In 1822 Kearns, Marsh and Packer travelled south from

Time	Period/Event	Comment
		Lake George to the Molonglo and Queanbeyan rivers.
1820s	European pastoralism	Land was rapidly taken up for pastoralism. The Murrumbidgee River formed the local limit to settlement within the 'nineteen counties'. By the 1830s most accessible land was occupied by large pastoral holdings.
1834	Burra Valley settlement	First recorded settlement in later London Bridge Homestead area. Cattle run at 'Katy's Flat'.
1857	London Bridge property purchased (3650 ha)	Land ownership became established in the 1850s. Holdings were gradually fenced and clearing of tree cover extended the area of (native) pastures (Duffy 1969). London Bridge property supported 4000 sheep and creek flats near the homestead were cultivated.
Late 19th century to World War II	Landscape deterioration	The pastoral landscape was seriously degraded by increased runoff following tree clearing and effects of rabbits. By the 1940s most cleared areas contained gullies, and streams show evidence of extensive bedload movement (Starr 2000). The expanding rabbit population made a serious impact by 1900, probably reaching its peak during WWII. Changes to the landscape were compounded by the effects of floods and drought.
World War II to present	Decline of pastoralism, improvement in land condition, rise of rural residential land use	Profound changes occurred in the pastoral economy (Starr 2000, p. 31): • rabbit control (introduction of *Myxomatosis* in 1951) and later sodium fluoroacetate poison ('1080') • introduction of crawler tractors allowed construction of farm dams away from water courses (stock numbers could be increased by accessing feed away from streams, riparian vegetation recovered to some extent) • use of fertilizer (especially superphosphate), mainly on native pastures with small areas of sown improved pastures and fodder crops. Combined effect was improved land stability and significant increase in naturally stabilising gullies (Eyles 1977). Rural residential development greatly expanded in the 1970s, particularly in the Burra valley.
1964–1988	Catchment protection	The Lake Burley Griffin Catchment Protection Scheme commenced in 1964. The Burra Creek project commenced in 1969 and the Googong Project, for the Queanbeyan River Catchment began in 1976. Work ceased in the Googong Catchment in 1988 (continuing in the Molonglo Catchment until 1998) (NSW DLWC 2000).
Water Supply and Associated Uses		
1973	Googong Dam Area acquired from NSW by the Commonwealth	Area comprises 5089 ha of 87 300 ha catchment of the Queanbeyan River. All timber below the high water level was removed prior to the completion of the dam.
1977–78	Dam completed and reservoir filled.	Dam height was later raised, based on revised rainfall data and flood estimates.
1979	Recreation use	A program of staged recreational development was commenced. Fish stocking began in 1980. Small electrically powered boats were permitted to use the reservoir in 1982 (Shorthouse 1983).
1981	Drought	Major drop in water level.
1982	London Bridge Homestead heritage listed	*London Bridge Homestead Group, London Bridge Road, via Queanbeyan, NSW* was entered on the Register of the National Estate.
1983	Wildlife Refuge	Googong Dam Area was declared a Wildlife Refuge under the *National Parks and Wildlife Act 1974* (NSW).
1987	London Bridge limestone arch heritage listed	*London Bridge Natural Arch, London Bridge Road, via Queanbeyan, NSW* was entered on the Register of the National Estate.

Time	Period/Event	Comment
1988	ACT self government	Under the *Canberra Water Supply (Googong Dam) Act 1974* (Cwlth) control over water supply and management of the Googong Dam Area was vested in the Territory Executive. ACT Government agencies manage the Foreshores.
2002–05	Drought	Major drop in water level (below 50% capacity).
2005	Cotter Googong Bulk Transfer program	Googong Reservoir is used to store water from the Cotter Catchment.
2005	Googong New Town	A proposed urban development of 5500 dwellings bordering the north-western boundary of the Foreshores.
2008	Murrumbidgee to Googong Water Transfer	Water pumped from Angle Crossing on the Murrumbidgee River, piped underground and discharged into Burra Creek. Anticipated commencement 2011.
2008	Googong Lease	Lease between the Commonwealth of Australia and the Australian Capital Territory giving the Territory control over the Googong Dam Area for 150 years.
2008	Commonwealth Heritage List nomination	'Googong Foreshores Cultural and Geodiversity Heritage Areas' (Place ID 106072) covering the London Bridge Homestead group, Woolshed and Shearers' Quarters and the London Bridge Natural Arch.

2.5 Googong Dam Catchment

2.5.1 Description and Land Use

Googong Foreshores (5089 ha) comprises about 6 per cent of the total Queanbeyan River Catchment of 87 300 ha. The Queanbeyan River rises in the Gourock Range (east of Bredbo) at an elevation of 1370 m flowing in a northerly direction through undulating country to Boolboolma Crossing, from where it traverses hilly to mountainous terrain dominated by the Tinderry Range. The largest sub-catchment is drained by Burra Creek, which rises in the northern part of the Tinderry Range and has its confluence with the Queanbeyan River covered by the waters of Googong Reservoir. The Queanbeyan River Catchment is underlain by granitic bedrock in the upper reaches, metasediments north of Boolboolma Crossing, and granites in the Tinderry Mountains (Michelago Sheet 8726, 1:100 000, Geological Survey of NSW). While average annual rainfall in the catchment is about 650 mm, it is highly variable and stream flows in the catchment are intermittent.

About 45 per cent of the catchment carries native forest and woodland cover while the remaining cleared and partially cleared areas are a mix of native and improved pastures. Pastoralism rather than broad scale cropping dominates rural land use, with climate being the main limiting factor for agriculture (Starr 1999). Grazing of cattle is the dominant use on the upper granite plateau with mixed sheep and cattle in the remainder. The other important land use is rural residential (s. 2.3).

Land tenure in the catchment is a mix of Crown land and private leasehold and freehold. Lands under NSW Government control include conservation reserves (Tinderry Nature Reserve, Burra Creek Nature Reserve, Tallaganda National Park, Tallaganda State Conservation Area) and Tallaganda State Forest. About 65 per cent of the catchment is in leasehold and freehold, the latter comprising slightly less than half of all the land. Use and management of freehold land is the responsibility of landholders, but is subject to state legislative and local government planning controls.

2.5.2 Management

No comprehensive management plan has been prepared previously for the Foreshores though a *Googong Catchment Administration Manual* (1988) and other guidelines have been used. After the dam was constructed, an Inspector, Googong Catchment was appointed by the (then) NSW Water Resources Commission (Starr 1999).

Outside the Googong Dam Area, management of the catchment is the responsibility of the New South Wales Government (s. 1.4.1) with an important role played by local government. A wide range of legislation is applicable (s. 1.4.3), administered by a number of government departments. Development activities are regulated through Local Environmental Plans prepared under the *Environmental Planning and Assessment Act 1979* (NSW) and Development Control Plans. Palerang Council administers the Googong Dam Area and Queanbeyan City Council administers the land on the north-western boundary of the Area. The southern part of the catchment is within the boundaries of the Cooma–Monaro Council. In terms of catchment management, application of the legislation is largely uncoordinated.

Given the increasing importance of Googong Reservoir in securing ACT and Queanbeyan water supplies, ACTEW has developed a catchment risk management plan to identify deficiencies in the management of the catchment and measures that can be taken to improve catchment management (Contos *et al*. 2008). This is one of the documents being used by ActewAGL as a basis for the Source Water Protection Program in the catchment, including Googong Foreshores.

While there is no coordinated mechanism for management of the catchment, relevant community based frameworks include:

- **Murrumbidgee Catchment Management Authority (CMA)**: This is a community based statutory authority established in 2004. The Murrumbidgee CMA has prepared a Catchment Action Plan under the *Catchment Management Authorities Act 2003* (NSW) (see <http://www.murrumbidgee.cma.nsw.gov.au/>).
- **The Upper Murrumbidgee Catchment Coordinating Committee (UMCCC)**: This is a community based organisation made up of agencies and groups that are responsible for natural resource management in the upper Murrumbidgee Catchment. The UMCCC operates as a regional cross border network to enhance communication between agencies and groups in NSW and the Australian Capital Territory, which lie wholly within the upper catchment of the Murrumbidgee River (above the Burrinjuck Dam wall).
- **Landcare and Parkcare**: Burra Creek Landcare Group, Friends of Googong Parkcare and Queanbeyan Landcare Group are active local groups affiliated with the Molonglo Catchment Group (see below). There is no Landcare group in the Queanbeyan River section of the Googong Catchment.
- **Catchment Groups**: These act as umbrella planning and coordination groups for smaller community organisations such as Landcare and Parkcare groups. Activities of the catchment groups (e.g. catchment plans and strategies) provide the basis to link with Commonwealth programs (in particular, 'Caring for our Country'). The Googong Catchment is included in the area of the Molonglo Catchment Group, formed in 2003, which has prepared a *Molonglo Catchment Strategy 2004–2014* (see <http://molonglocatchment.com.au>). This strategy is being implemented with the support of the ACT and Commonwealth governments.

2.6 Defining the Values of Googong Foreshores

For most people, the significance of a place arises from a combination of many values (see **Glossary**). The identification of the values attached to a place is an essential first step in formulating management requirements and preparing a management plan. *Core values* relate to natural or cultural heritage, though the two may be inter-related, overlap and are considered inseparable by some people e.g. many indigenous people as well non-indigenous people with strong cultural connections to nature (Australian Heritage Commission 2002a; Worboys et al. 2005). *Derived values* (e.g. recreation, tourism, education, scientific, economic) are based on these core values (NSW NPWS 2006). A second essential step is to assess the significance of the values and the components that make up a category of values. There are various criteria that are used to assist in the assessment of significance e.g. the presence of places and objects on statutory heritage registers.

Some values are geographically based and can be assigned to a particular site (e.g. London Bridge Homestead) or a group of sites (e.g. Aboriginal sites based on artefact scatters or remnants of natural temperate grassland). Others are less place-specific and may refer to a value held by the whole protected area (e.g. recreation and education opportunities). Some values may be more intangible. Social value is based on the attachment of people to places such as Googong and is often represented by the ongoing involvement with the place e.g. regularly visiting to go fishing.

Natural significance means the importance of ecosystems*, biodiversity* and geodiversity* for their existence value* or for present or future generations, in terms of their scientific, social, aesthetic and life-support value (*Australian Natural Heritage Charter*. 2nd edition (Australian Heritage Commission 2002a)).
Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations (*Australia ICOMOS Burra Charter, 1999* (Australia ICOMOS 1999)).

* See **Glossary**.

The landscape of Googong Foreshores can be seen as having overlapping or layered values that are both natural and cultural. The natural environment of the area contains exposed relict geological features from hundreds of millions of years ago, diverse ecological communities with plants and animals that have ancient ancestry, evidence of many thousands of years of occupation by Aboriginal people, as well as more recent uses by European settlers. Many values are inter-related e.g. London Bridge Natural Arch is a significant geological feature which is also of cultural heritage significance to Aboriginal people. Some are composites of other values e.g. ecosystem services, a concept that refers to the products of natural systems that benefit people (National Biodiversity Strategy Review Task Group 2009; PMSEIC 2002) (see **Glossary**). Vegetated natural environments of the Googong Catchment, for example, contribute to maintaining the quality of the water in the reservoir.

Multiple values build richness in some places, but they may also create conflicts as to which should be given priority. The decision to conserve one value may contribute to the degradation of another. Management requires explicit information about each value and its significance so that important values can be conserved and priorities determined for management effort (NSW NPWS 2006). The identification and assessment of values is not independent of the wider social setting, as is evident by the much greater prominence given to Aboriginal cultural heritage in recent times.

For Googong Foreshores the primary purpose (and value) is the provision of high quality raw water for potable water supply to the ACT and Queanbeyan. The other values of the Foreshores which are secondary to water supply are placed within an overall management framework based on multiple use. The values of the Foreshores are outlined in Table 2.2.

Table 2.2 Values of Googong Foreshores

1. Water Supply	Water storage and supply is the primary purpose of the area. Water quality in the reservoir should be maintained at a level that is not less than the quality when the water enters the reservoir from the catchment.
2. Natural Heritage	The area has important biodiversity, geodiversity and landscape values. Googong Foreshores forms part of a corridor of relatively intact vegetation extending from the Tinderry Range to the north-eastern ACT. The area contains a number of threatened ecological communities and plant and animal species. London Bridge Natural Arch is a significant geological feature.
3. Cultural Heritage	Archaeological evidence indicates the area was occupied by Aboriginal people—an 'upland campsite'. London Bridge Natural Arch is a significant cultural feature. London Bridge Homestead is a rare example of a early homestead complex that contains progressive additions over the period from about 1870 to 1950. The more recent woolshed and shearers' quarters at London Bridge car park are also links to the European pastoral period.
4. Recreation	The area is a recreational resource of considerable value to residents of Canberra, Queanbeyan and adjacent areas. Recreational activities are restricted to those that are compatible with the area's primary purpose of providing raw water for potable water supply. These activities include fishing, picnicking, bushwalking, mountain biking, canoeing, nature-based activities such as bird watching, and visiting cultural heritage sites. To protect water quality, specific controls and restrictions apply. The waters of the reservoir provide a scenic attraction and backdrop to recreational activities.
5. Education and Research	Googong Foreshores provides opportunities for education and research related to the other values of the Foreshores.

Management details related to the conservation of these values are discussed in Chapters 4 to 8.

The Googong Dam Area is subject to the provisions of the EPBC Act that relate to Commonwealth land (s. 1.4.2). In relation to this, an Aboriginal heritage assessment (ERM Australia 2008a), heritage assessment (ERM Australia 2008b) and heritage management plan (ERM Australia 2008c) have been prepared by the Commonwealth.

These heritage studies have identified the following heritage values for the Area in relation to the EPBC Act:

- *Natural heritage values* deriving from, or in relation to:
  - the diverse array of ecological communities, flora and fauna species, threatened and/or rare species and ecological communities
  - the ecological connectivity provided by the Area, in particular, the relatively undisturbed eastern Foreshores
  - the recreational, scenic and aesthetic values based on the natural environment
  - the scientific value based on the ecological communities and species present in the Area (including the presence of two raptor species).

- *Geodiversity heritage values* relating to:
  - London Bridge Natural Arch, which is considered to be important as a good example of cave formation in karst and offering insight into the natural landscape development in the area. The arch also has aesthetic, educational and scientific values and has been visited by humans for thousands of years.

- *Historic heritage values* relating to:
  - the London Bridge Homestead group and outbuildings, including the Woolshed and Shearers Quarters, as a cultural landscape valued for providing historical understanding, landscape qualities and aesthetics (vernacular farm buildings).

- *Indigenous heritage values* relating to:
  - the diverse range of known Aboriginal sites including the London Bridge Arch which has been identified as a sacred area. Googong Foreshores has potential for further archaeological and ethnographic study related to Aboriginal settlement in the area.

The heritage assessments have determined that parts of the Googong Dam Area meet the threshold for inclusion on the Commonwealth Heritage List for their cultural and geodiversity values. This has formed the basis for the nomination of the place (described as the 'Googong Foreshores Cultural and Geodiversity Heritage Areas') to the list, for subsequent determination by the Australian Heritage Council (see Australian Heritage Database: Commonwealth Heritage List/Historic/Nominated Place/Place ID 106072 <http://www.environment.gov.au/cgi-bin/ahdb/search.pl>).

This elaboration of heritage values related to Commonwealth requirements is complementary to the overall values framework outlined in Table 2.2 as a basis for the management of the Googong Dam Area. However, the heritage provisions of the EPBC Act do not cover the primary water supply purpose of the Area and the management responsibilities of the ACT Government. Therefore the values identified above in relation to the Act do not form a sufficient basis, by themselves, for a comprehensive management plan.

2.7 Management Goals and Objectives

2.7.1 Management Goals

Related to the primary purpose of Googong Foreshores and the values in Table 2.2 the following goals are defined for the management of the area:

1. **Googong Reservoir supplies high quality raw water for potable water supply[a].**
2. **Natural and cultural values at Googong Foreshores are conserved[b] in perpetuity.**
3. **The residents of Canberra, Queanbeyan and the region value Googong Foreshores for its recreational, educational and research opportunities related to the natural and cultural values of the area.**

Note:

a Within the limitations imposed by the effects on water quality of historical land use and management, the present types of land use, and the standard of management in the larger Queanbeyan River Catchment.

b See **Glossary**: Conservation.

2.7.2 Management Objectives

Related to the above goals and the values identified in section 2.6, a small number of primary objectives can be identified for the management of Googong Foreshores. More specific management objectives are included in Chapters 4 to 10.

Water Storage and Supply

- Water stored in Googong Reservoir is of the highest quality* and is not adversely affected by activities occurring in Googong Foreshores.

  (within the limitations imposed by wider catchment conditions)

Natural Heritage

- The biodiversity, geodiversity and landscape values of Googong Foreshores are conserved.
- Ecosystems are managed so that they continue to function and evolve naturally and the integrity of landscapes and scenery is protected.

Cultural Heritage

- Cultural heritage within Googong Foreshores is identified, conserved, and where appropriate, interpreted and promoted to retain and foster community associations and an appreciation of the past.

Recreation

- Googong Foreshores provides a variety of recreational opportunities that are consistent with the protection of the water supply catchment, reservoir water quality, and natural and cultural heritage values.

Education and Research

- Opportunities are provided for the community to acquire knowledge of the values of Googong Foreshores and to understand its primary water supply purpose.
- Research is undertaken at Googong Foreshores that contributes to management of the area and the conservation of its values.

Community Involvement

- Community partnerships are formed that effectively contribute to the management of Googong Foreshores and protection of the values of the area.

2.8 Management Principles

The management objectives, policies and actions contained in this management plan are based upon the following principles:

Precautionary principle: Planning and management decisions need to be made in line with the precautionary approach. Where there are threats of *serious* or *irreversible* environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

Limits of acceptable disturbance: All human activities and uses of the Foreshores will result in some degree of impact. Such disturbances will be managed within physical impact thresholds. Inconsequential or trivial impacts will be separated from those that are serious, irreversible or cumulative.

Adaptive/experimental management: Research, monitoring, new knowledge and the outcomes of performance evaluation should continually inform management, with policies adjusted accordingly.

Best practice: Knowledge, skills and management practices are continually improved by keeping up-to-date with new technology and ideas.

Education and environmental stewardship: Education is essential to promote an understanding and appreciation of the area's values and to encourage individuals to take personal responsibility for protecting those values. Interpretation is an important educational activity.

Transparency and accountability: Decision-making processes and the performance of land managers and other authorities should open to public scrutiny.

Chapter 3 Management Zones

3.1 Purpose of Zoning

This chapter defines three management zones for Googong Foreshores:

- Zone 1: Restricted
- Zone 2: Low Impact Recreation
- Zone 3: Serviced Recreation Areas.

Broadly this zoning represents a gradation from management giving priority to protecting reservoir water quality (Zone 1) to varying levels of multiple use (Zones 2 and 3).

Zoning is a system of defining areas within a place based on the values that management aims to protect and the types of activities that will be permitted. It is a means of expressing management priorities for particular areas related to management goals and objectives. Zoning categories and the boundaries of management zones are determined by the spatial arrangement of key values. The main purpose of zoning is to specify the appropriate levels and forms of use and access (particularly for recreation), related to the values, and associated facilities and management requirements (NSW NPWS 2006).

Management zones at Googong Foreshores take into account the primary management objectives outlined in s. 2.7.2. Other related considerations are:

- the suitability of areas for particular activities
- the avoidance of conflict between users with different interests
- the need for specific protection measures for natural and cultural heritage (e.g. for habitat of threatened species and for cultural heritage sites)
- the difficulty of access to some areas (for both routine and emergency purposes)
- the high cost of installing and maintaining facilities in some areas.

Restrictions on the types of boats allowed on Googong Reservoir are outlined in s. 5.4.

3.2 Management Zones

Three management zones have been defined for Googong Foreshores (Figure 3.1):

ZONE 1: RESTRICTED

This zone includes the Reservoir Off-take Area and the Eastern Foreshores. High priority is given to protecting water quality near the off-take and special restrictions apply to boating and shoreline access in this area.

Zone 1A: Reservoir Off-take Area

Description: This area includes the dam wall and off-take tower and extends 1500 m upstream including the adjacent shoreline. These areas are shown on the *Googong Foreshores Map and Guide* which is made available to visitors to the Foreshores.

Characteristics: The area is also referred to as the Water Off-take Protection Zone. No public access is permitted along the shoreline areas to prevent the risk of pollution to water flowing into the reservoir in close proximity to the off-take. Boat access is allowed to the area, but fishing from or landing on the shore is not permitted. Boat access is

prohibited near the dam and spillway (north of a line drawn from the dam lookout to the point west of Borrow Pit Bay and shown by a line of marker buoys). This protects users from any physical hazard near the off-take tower and spillway.

On the western shoreline, this zone includes Drumstick Point (boat ramps) and extends north to the dam wall, Saddle Dam and Borrow Pit. On the eastern shoreline, the zone extends south from Borrow Pit Bay, around Bradleys Inlet (outlets of Bradleys Creek and Smiths Creek) and includes the peninsula around Feagans Trig.

The following restrictions apply to watercraft landing:

- west side of reservoir: not permitted on shoreline north of the disabled car park on Drumstick Point (except at the nearby boat ramp)
- east side of reservoir: not permitted on shoreline north of an alignment with Long Neck Island.

Zone 1B: Eastern Foreshores

Description: This area extends from the southern edge of Bradleys Inlet to Compo Canyon on the Queanbeyan River arm of the reservoir and includes the land from the water's edge to the eastern boundary of Googong Foreshores.

Characteristics: The area is steep, rugged and is mostly covered by dry sclerophyll forest. The southern part of the Eastern Foreshores has gentler local relief. Other than by water, the area is difficult to access. A number of vehicle tracks (fire trails) enter from private property on the eastern boundary. This zone has significant biodiversity values, including threatened species habitat, and is an important component of regional ecological connectivity.

ZONE 2: LOW IMPACT RECREATION

This zone comprises six separate areas that span the length of Googong Foreshores. While catchment protection remains the highest priority overall, these areas support low key land and water based recreational activities.

Zone 2A: Western Foreshores, Queanbeyan River (south), Northern Areas

Description: The Western Foreshores area extends from Drumstick Point to Tin Hut Inlet, but does not include Tin Hut Dam. The Queanbeyan River arm includes land either side of the Queanbeyan River above the reservoir. The two northern areas are in the vicinity of the Ranger Station on Googong Dam Road and near the north-eastern boundary of the Googong Foreshores, respectively, and include the shoreline.

Characteristics: The Western Foreshores is former pastoral country, comprising grassland and varying levels of tree cover. Access for management purposes is along a north-south vehicle track. Land along the Queanbeyan River arm is hilly, tree covered, and includes partly cleared areas at lower elevations near the eastern boundary of Googong Foreshores. Land in zone 2A in the north-east is between Zone 1A and the Foreshores boundary and is a steep, forested area. The other northern area is forest and grassland near the Ranger Station and immediately south of the Water Treatment Plant. Important biodiversity values include remnant vegetation and habitat for threatened species.

Zone 2B: Burra Creek

Description: This area is land either side of Burra Creek, south of London Bridge Homestead.

Characteristics: Cleared former pastoral country with some patches of tree cover. Access is by a vehicle track south of the homestead or off Burra Road, which forms the south-west boundary of Googong Foreshores. Recreation is not encouraged in this area.

Zone 2C: Reservoir Waters and Shoreline

Description: This includes all reservoir waters south of Zone 1A.

Characteristics: The reservoir comprises open waters in the northern sections with an indented shoreline narrowing considerably to the south. The reservoir is popular for fishing and is maintained as a mixed fishery with stocking of native and alien species.

ZONE 3: SERVICED RECREATION AREAS

This zone comprises two areas, in the north and south of the Foreshores respectively. These areas support more intensive recreation and the southern area has significant cultural heritage values.

Zone 3A: Foreshores Car Park, Cascades, Downstream Picnic Area

Description: This area extends from the Foreshores car park (Drumstick Point) northward and easterly to Borrow Pit Bay outside of Zone 1A. It includes the Queanbeyan River below (north of) the dam wall and therefore not part of the reservoir catchment.

Characteristics: Most of the area is highly modified former pastoral country. As well as water supply infrastructure, the area contains sealed road access, car parks, picnic areas, swimming areas, barbecue facilities, toilets, lookouts and walking tracks. In general, recreational activities in this area do not have the potential to impact directly on the reservoir water quality.

Zone 3B: London Bridge and Tin Hut

Description: This area extends from Tin Hut Dam to London Bridge Homestead and includes submerged sections of Burra Creek and the Queanbeyan River.

Characteristics: The area is mostly highly modified former pastoral country. It is accessed from Burra Road by sealed and unsealed road to car parks at Tin Hut and London Bridge Woolshed. In the Tin Hut area there is shelter, toilets, barbecue facilities, bird hides (Tin Hut Dam) and a walking track to Tin Hut Inlet. At the woolshed there are barbecues, picnic facilities and toilets. From this car park there are vehicle trails used for management purposes, as well as for walking and mountain bike riding. There are also some tracks for walkers only. London Bridge Homestead is accessible by foot or bicycle along a fire trail from the car park. Zone 3B contains the most important cultural heritage sites (both Aboriginal and European) in the Foreshores.

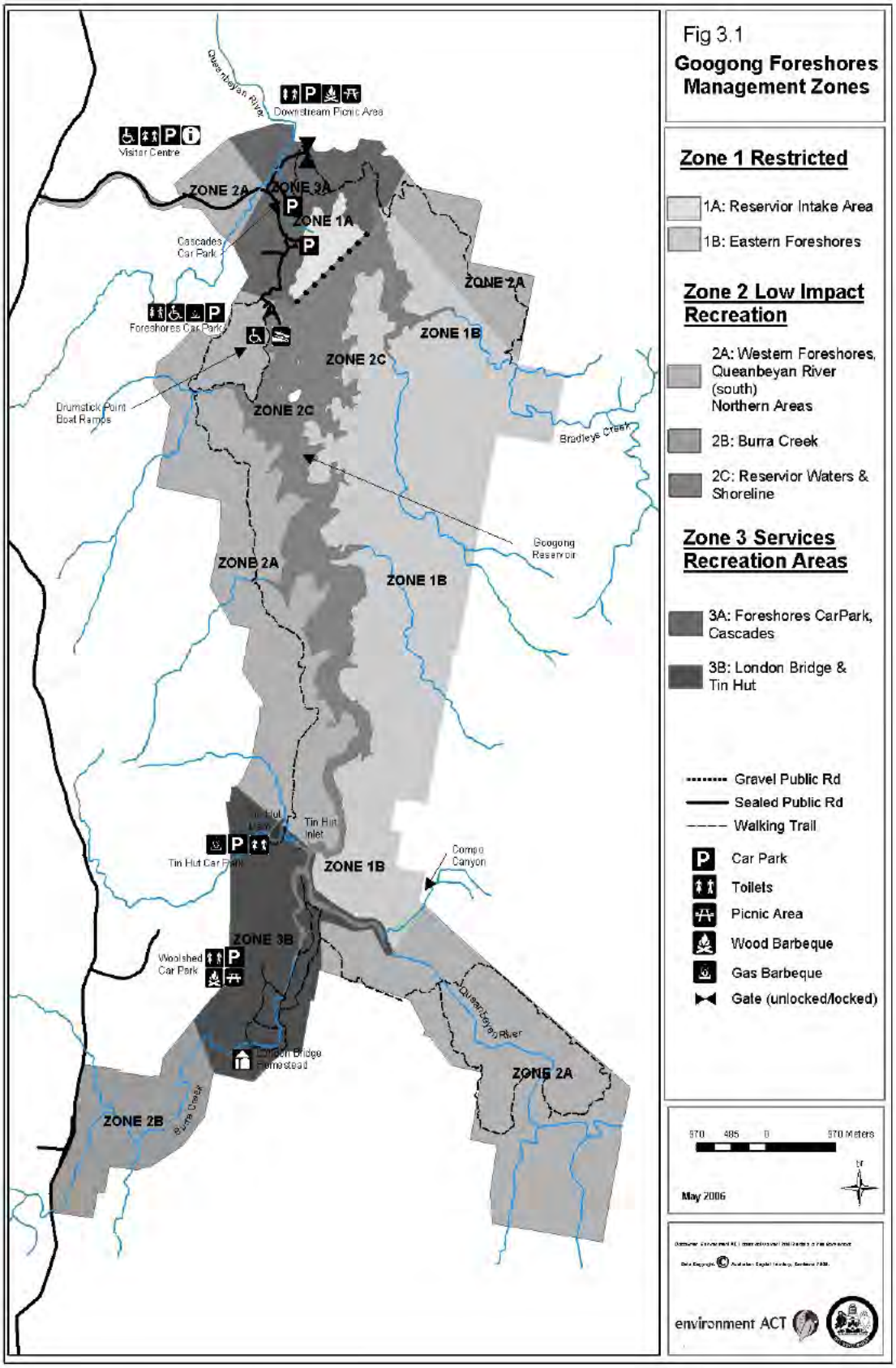

Figure 3.1 Googong Foreshores management zones

Chapter 4 Water Resources

4.1 Water Storage and Supply: Primary Management Objective

Water stored in Googong Reservoir is of the highest quality* and is not adversely affected by activities occurring in Googong Foreshores.

(*within the limitations imposed by wider catchment conditions)

It is intended that management of Googong Foreshores provides a model of best practice for the rest of the water supply catchment. Water quality in the reservoir should be maintained to at least the same level as when it enters the storage, and preferably improved, where this is feasible.

4.2 Importance of Googong Water Supply

Water for Canberra and Queanbeyan is supplied from the Cotter, Murrumbidgee and Googong catchments. The three Cotter storages (Corin, Bendora and Cotter) have a combined storage capacity of 86 gigalitres (GL) while Googong Reservoir has the capacity to store almost 122 GL (121 500 million litres). The Googong Catchment is about twice the size of the Cotter Catchment, but typically receives less rainfall and provides a lower yield of water than the Cotter Catchment. Prior to the 2003 bushfire, the need to treat Googong water, the lower level of its clear water storage tank, and distance from Canberra meant that it was more difficult and expensive to distribute than Cotter Catchment water treated at Mt Stromlo. For these reasons, though Googong Reservoir is an integral part of the Canberra water supply network, Cotter Catchment generally had been the first choice source. Before the 2003 fire, Googong supplied on average about 16 per cent of Canberra's water supply needs, being drawn upon primarily during the peak summer period and in time of drought.

The importance of the Googong supply was evident following the January 2003 bushfire in the ACT when Cotter water was rendered unusable for a period of time due to high levels of turbidity. The Mt Stromlo Water Treatment Plant was substantially upgraded to enable water from the bushfire affected Cotter Catchment to be effectively treated. Water is now drawn from the Cotter Reservoir and the Murrumbidgee River for treatment at Mt Stromlo as a drought contingency response. These measures have increased the cost of treating Cotter Catchment water.

Following the effects on water supply of the 2003 bushfire and examination of future water supply options for the ACT and Queanbeyan (ACT Government 2004a, Vol 1), the use of existing infrastructure to increase available supply was evaluated and the *Cotter Googong Bulk Transfer* program developed. The large storage capacity at Googong Reservoir (severely depleted of water after the 2003 bushfire) has a key role in this scheme, which commenced in late 2005. The program involves diverting a proportion of the 'spills' from the Bendora and Cotter dams via the gravity main to Mount Stromlo Water Treatment Plant. After meeting urban demand, the surplus water is transferred to Googong Reservoir using the existing supply network and a bypass pipeline around the Googong Water Treatment Plant (ACTEW 2005).

The volume of water stored in Googong Reservoir will also be augmented by the planned *Murrumbidgee to Googong Water Transfer*. This project involves pumping water from the Murrumbidgee River near Angle Crossing (close to the southern border of the ACT),

transferring it through an underground pipeline, and discharging it into Burra Creek upstream of Googong Reservoir. This project has the potential to provide up to an additional 100 ML/day of water into Googong Reservoir for potable water use, significantly enhancing the large storage value of the reservoir.

Average rainfall in the Googong Catchment is about 650 mm, but is highly variable and stream flows in the catchment are intermittent. Flows into the reservoir declined during the period 1994–2005. This could be due to an increase in the number of farm dams in the catchment (AGRECON 2005 in Contos et al. 2008) and/or other factors such as a decrease in average rainfall, a decrease in the number of run-off generating events, and an increase in river and groundwater abstractions (Falkland 2006 in Contos et al. 2008). Various studies of stream flows in NSW indicate that climate change is likely to further reduce future flows, with subsequent consequences for storages and supply (Contos et al. 2008). The risk of bushfire is also likely to increase (CSIRO 2006 in Contos et al. 2008) resulting in poor water quality following the event and reduced yields over time as regrowth vegetation uses more water. Management of Googong Foreshores has little effect on catchment yield, but through maintaining local catchment conditions and managing fire regimes can make an important contribution to reservoir water quality that is potentially affected by the impacts of climate change.

4.3 Management of Water Supply

As noted in s. 1.2, water supply infrastructure and the use of water stored in Googong Reservoir are managed by ActewAGL. This includes responsibility for the provision and maintenance of water supply and storage infrastructure, dam safety, water distribution network, reservoir drawdown, treatment for drinking purposes, and monitoring of water quality. Neither ACTEW nor ActewAGL have regulatory powers to control land use in the catchment.

The role of the ACT Government, in relation to the ACT Executive's duty of environmental protection under the Googong Dam Act is to manage activities in Googong Foreshores to ensure that they do not impact adversely on the area's primary purpose of providing raw water for potable water supply. The ACT Government also regulates the taking of water and the provision of environmental flows from the dam.

4.4 Water Quality

The importance of active catchment management as a first stage in the barriers to protect raw water sources from contamination is given prominence in the *National Water Quality Management Strategy* (ANZECC/ARMCANZ 2000a). The water quality in Googong Reservoir is relatively high (ACT Government 2004a, Vol 3). However, maintenance of this condition is uncertain given the lack of coordinated management of the wider catchment (s. 2.5). As noted in s. 2.5.2, ActewAGL is undertaking a Source Water Protection Program in the catchment. While the ability to influence the quality of the water flowing into the Googong Dam Area is limited, the large capacity of the reservoir and its use in the past as mainly the second choice supply has resulted in a long retention time for inflowing water that is significant for die-off of micro-organisms (s. 4.4.2). A risk management framework for managing water quality impacts at the Foreshores is contained in Appendix 4.

4.4.1 Water Quality Standards and Guidelines

Under the *National Water Quality Management Strategy* (ANZECC/ARMCANZ 2000a), guidelines have been developed to cover issues across the whole of the water cycle and

are updated as required. Of particular relevance to Googong Reservoir are the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ 2000b) and the *Australian Drinking Water Guidelines* (NHMRC 2004). These guidelines are not mandatory but set a framework or parameters for specification of guidelines or standards (see **Glossary**) at the state, territory or regional level.

4.4.2 Factors Affecting Water Quality

Given the water quality benefit of retention of water in Googong Reservoir before its use in water supply; direct contamination in Googong Foreshores, especially in the downstream section near the off-take, may pose a more serious threat than similar contamination higher in the catchment. There is, therefore, a need to manage activities and catchment condition in the Foreshores so as to minimise the risk of adverse effects on water quality. Although pathogens are effectively inactivated in reservoirs, making them excellent barriers to contamination, storage time is a key factor and inactivation rates are measured in days to weeks (Water Futures/CRCWQT 2004).

Contaminants of most concern in water supply catchments are:

a) micro-organisms (in particular organisms that are pathogenic or harmful to humans) (s. 4.4.3)
b) suspended material (soil and organic debris) (s. 4.4.4)
c) excess nutrients (in particular phosphorus and nitrogen) (s. 4.4.5)
d) chemicals (including pesticides, herbicides, hydrocarbons) (s. 4.4.6).

4.4.3 Micro-organisms

The most common and widespread health risk associated with drinking water is contamination, either directly or indirectly, by human or animal excreta and the micro-organisms contained in faeces (NHMRC 2004). Micro-organisms (bacteria, viruses, protozoa and helminths) are found in most aquatic environments and some are pathogenic (disease causing) or otherwise harmful to humans. It is not feasible to regularly monitor water bodies for all potential pathogens, and therefore an indicator measure (faecal coliforms) has been developed to use as a guideline. The presence of faecal coliforms in a water sample may be an indication that human or animal faeces have contaminated the water and that harmful, less easily detectable pathogens such as *Cryptosporidium* or *Giardia* may be present (ACT Government 2008). Conventional water treatment reduces, but does not completely eliminate pathogen contamination. *Cryptosporidium*, for example, is resistant to disinfection by chlorine and a proportion of *Cryptosporidium* oocysts are able to pass through filters (Water Futures/CRCWQT 2004).

The first barrier to the entry and transmission of pathogens to the water supply system is to protect the catchment from contamination by human and animal faeces. While human access to reservoirs used for drinking water supply potentially increases the risk of microbial contamination, there is some difficulty in attributing cause and effect, and in particular, linking an aspect of access with the magnitude of an effect (Water Futures/CRCWQT 2004). There is no evidence to date of the managed recreational activities at Googong Foreshores (in particular, water based ones) having a detrimental effect on the microbiological aspect of water quality. It is important, however, to remain vigilant in ensuring that recreational activities continue to be compatible with the primary purpose of supplying high quality raw water.

Pathogen contamination remains a risk to Googong water, with a limited study by Hanigan (2002) indicating the middle and northern parts of the catchment (outside the Foreshores) as primary source areas. On-site sewage systems and septic systems are potential sources of pathogens and nutrients and in the catchment. Local government has the primary environmental and public health responsibilities in relation to these systems under the provisions of the *Local Government Act 1993* (NSW) and, in particular, clause 29 of the *Local Government (General) Regulation 2005* (NSW).

OBJECTIVE: MICROBIOLOGICAL WATER QUALITY

- Water in Googong Reservoir conforms to applicable microbiological standards and guidelines for raw water[1] quality within the framework of the National Water Quality Management Strategy.

1 Water held in the reservoir prior to its treatment for domestic water supply.

Policies

- As part of catchment-wide source water protection, control of the potential for contamination of Googong Reservoir by harmful micro-organisms will be given high priority in managing Googong Foreshores. Particular attention will be given to toilet facilities, human access and recreation, stock grazing, and grazing by native and feral animals.

(a) Toilet Facilities

Within Googong Foreshores, toilet facilities comprise:

- nine septic tanks (London Bridge Woolshed toilet block, Chelsea homestead, rangers' dwellings (one tank serving three houses), Ranger Station/Visitors Centre, PCL staff workshop/recreation room, downstream picnic area near the dam wall, dam wall lookout, water treatment plant site, pump station)
- portable toilet (London Bridge Homestead), replacing a disused long-drop toilet
- pump-out toilet (Tin Hut)
- a waterless composting toilet at the Foreshores Car Park (near the boat ramps).

In addition there are five sites where there may have been septic tanks:

- three former dwellings south of Chelsea Homestead (south-western part of the Foreshores near Burra Road)
- a former dwelling at Tin Hut
- a former homestead now underwater (between the dam lookout and the Drumstick Point).

(GHD 2007)

With regard to the latter group, it is not known if the septic tanks were backfilled when the houses were buried. There has been no testing to assess the presence of soil or groundwater contamination related to either the operational facilities or from the possible septic tank sites.

Both the present toilet facilities and possible former septic tank sites are considered to represent minor potential point sources for human pathogens and excess nutrients entering the groundwater or potentially reaching the reservoir (GHD 2007). There is a low concentration of these facilities in the Foreshores compared to the adjacent rural sub-divisions of Burra and Urialla. The ACT Government has installed a pump-out toilet with concrete holding tank at Tin Hut and this is probably the most desirable approach for

toilet facilities in the area, especially those that are close to the water or to drainage lines. As part of the Googong Lease negotiations, the ACT Government and ActewAGL have undertaken to investigate the risks to reservoir water quality from these installations and buried former homesteads.

Toilet Facilities: Actions

- Investigate the septic tanks in Googong Foreshores to determine whether these represent a significant risk to human health and the environment (ACT Government and ActewAGL).
- Evaluate the costs and benefits of a staged replacement of septic tanks with concrete tanks that are periodically pumped out, with the contents processed through an off-site sewage facility.

(b) Recreation

Recreational use of water supply catchments and reservoirs has the potential to impact adversely on microbiological water quality and for this reason access is generally prohibited or restricted. This consideration has guided the controlled development of recreational opportunities at Googong Foreshores since 1979. Recreational activities and policies are outlined in Chapter 5.

Recreation: Actions

Manage recreational use of Googong Foreshores to minimise impact on microbiological water quality, in particular by:

- prohibiting body contact recreation in the reservoir (swimming, windsurfing, water skiing)
- prohibiting other recreational activity that has the potential to adversely affect water quality (Table 5.1)
- providing advisory signs for recreational users on the importance of avoiding body contact with reservoir water and the need for good hygiene
- providing adequate toilet facilities that are regularly monitored and maintained
- prohibiting pets and horse riding
- involving community groups, where appropriate, in management activities in the Foreshores aimed at protection of water quality.

(c) Stock Grazing. Domestic animals play a role as reservoirs of pathogens potentially transmissible to humans (O'Neill 1985, pp. 45–46), and faecal contamination from sheep and cattle is potentially a high risk to water quality. In addition, where stock have direct access to streams they cause significant damage to riparian zones (ACT Government 2007a). *Cryptosporidium* is an example of a micro-organism carried by cattle. Contamination is a greater risk from cattle under two years old as they are more likely to scour than mature cattle. Grazing is generally not permitted in the Foreshores, but has been used occasionally for fire-fuel reduction in grassland areas and for weed control, in selected areas away from the reservoir shoreline. While grazing is the main land use in the larger catchment, the shorter retention time for inflows to the reservoir from the Foreshores has a potentially greater impact, particularly at times when Googong water is being used. Much of Googong Foreshores is surrounded by pastoral land from which there is incursion of sheep and cattle inside the boundary fence.

In light of its potential to impact on microbiological water quality, stock grazing at Googong Foreshores will only be allowed when and where there is no feasible alternative management option for fire fuel reduction or weed management. This will be carried out

in accordance with the Strategic Bushfire Management Plan for Googong Foreshores (Bushfire and Environmental Services 2007) (s. 9.1) and with the notification and approval of ActewAGL. Calves will not be allowed in the area.

Stock Grazing: Actions
Manage stock grazing at Googong Foreshores to minimise impact on microbiological water quality, in particular by:

- restricting use of stock grazing to the minimum necessary for fire fuel reduction in grassland and for weed control and to areas outside an appropriate buffer from the reservoir
- requiring stock to be more than two years old
- exclusion of stock from ephemeral and permanent streams and drainage lines by fencing and the provision of off-stream watering
- removal of stock as soon as fire fuel reduction or weed management objectives have been achieved
- ensuring vegetation cover is not compromised by stock grazing
- maintaining boundary fencing of the Foreshores to prevent stock access from neighbouring properties
- liaison with properties bordering the Foreshores for removal of stray stock.

(d) Grazing by native and feral animals
Feral animals may also be reservoirs of pathogens potentially transmissible to humans (O'Neill 1985, pp. 45–46). Faecal contamination from kangaroos and other native animals presents a lower risk to humans because humans are well separated from these animals in an evolutionary sense. As well as direct water quality effects, management of the numbers of native and feral animals is important in terms of grazing pressure and loss of ground cover. Consequent increased runoff and erosion increases the opportunity for transport of micro-organisms to the reservoir.

Grazing by Native and Feral Animals: Actions
Control populations of native and feral animals at Googong Foreshores to minimise direct and indirect impacts on microbiological water quality, by:

- managing kangaroo densities (see s. 6.7)
- undertaking feral animal control using the most effective current approaches that are also suitable for use in a water catchment.

4.4.4 Turbidity and Suspended Solids

Early concerns about the catchment were focused on erosion and potential sedimentation of Googong Reservoir. Reviews by Starr (1999, 2000) concluded that the catchment was, in general, in a much-improved state compared with the post World War II period. Erosion problem areas in both the Burra Creek and Queanbeyan River catchments were treated under the Lake Burley Griffin Catchment Protection Scheme (Table 2.1) (NSW DLWC 2000). An investigation of sedimentation in the reservoir in 1990, concluded that the volume of sediment was 175 500 cubic metres (0.14% of the storage) (Starr 1999). This is a low rate, comparable to other catchments on the Southern Tablelands. An analysis by Starr (2000) of drainage networks in the catchment since 1944 concluded that many have progressed from erosional systems with high transport efficiency to depositional systems that may filter much of the water flowing through the catchment, which is typical of much of the upper Murrumbidgee Catchment (Starr et al. 1999). The other notable changes have been extensive natural regeneration of tree cover and overall reduction in stocking rates (Starr et al. 1999). High sediment loads occur in Burra Creek

related to high-energy flows and active erosion of a major alluvial in-fill valley in the creek. Management of the Tinderry Nature Reserve aims to minimise such flows through retention of native vegetation along the creek, an appropriate fire regime and sediment control measures for works (NSW NPWS 1998).

A range of activities have the potential to initiate soil erosion in the catchment including public and private roadworks, other earthworks on rural properties (including rural residential), forestry operations, overgrazing and riparian grazing. Erosion and removal of burnt material following bushfires in the catchment have the potential to cause serious impacts on reservoir water quality (see s. 9.1).

Turbidity measures the amount of suspended material in water but also includes colouration (e.g. from tannin). Suspended solids comprise organic and inorganic particles of varying sizes, ranging from fine clay soil particles (common in the Canberra region) to coarse plant materials such as leaves. Elevated turbidity levels commonly occur after storm events. In water bodies they can also be due to re-suspension of sediments from shallow areas in windy conditions or result from mechanical disturbance, such as from wash and propellers of powerboats. Turbidity can also derive from roads and stream crossings. Turbidity is an important public health consideration as bacteria and pollutants are often attached to the surface of suspended material.

Minimising ground disturbance, maintaining vegetation especially ground cover, slowing overland flow, restricting activity in erosion-prone areas, and filtering runoff from bare areas (vehicle and walking tracks) all contribute to reducing turbidity. The *ACT Natural Resource Management Plan* sets a ground cover target of 90 per cent for 12 months of the year on land classes IV to VI (grazing or mainly grazing land) as a target to minimise exposure of such lands in the Murrumbidgee Catchment to water and wind erosion (ACT NRM Board 2004). This provides a useful measure for the non-forested areas of the Googong Foreshores, except in areas of skeletal soils and bedrock exposure.

OBJECTIVE: TURBIDITY AND SUSPENDED SOLIDS

- Water in Googong Reservoir conforms to applicable turbidity standards and guidelines within the framework of the National Water Quality Management Strategy.

Policies

- Control of the potential for contamination of Googong Reservoir by soil erosion and transport of materials will be given high priority in managing Googong Foreshores.

Actions

- Manage stock grazing and populations of native and feral animals to limit loss of ground cover and soil disturbance, and consequent erosion and transport of material to the reservoir.
- Restrict recreational activities in the steep Eastern Foreshores area (Zone 1B) and areas with low vegetation cover to limit erosion potential (see also Chapter 5).
- Undertake stabilisation and erosion control measures in areas of the Foreshores that show evidence of erosion developing.
- Where feasible, direct and filter runoff from bare areas (e.g. vehicle and walking tracks) to detain sediments that might otherwise flow to the reservoir.
- Aim to maintain 90 per cent ground cover for 12 months of the year in non-forested areas of the Foreshores (excluding areas of skeletal soils and bedrock exposure).

4.4.5 Excess Nutrients (Phosphorus and Nitrogen)

Nutrients are a natural component of all water bodies, but increases in their supply often have undesirable effects, including the eutrophication of aquatic ecosystems (ACT Government 2008). Eutrophication is the presence of an abnormally high quantity of plant nutrients. This can lead to excess algal growth including algal blooms that have recreational, ecological and public health implications. Cyanobacteria (blue-green algae) are of particular concern as they can produce toxins that are poisonous to people and animals. Blue-green algae counts typically increase during the summer period at Googong with significant 'blooms' a regular feature (Contos et al. 2008). This may necessitate extra measures in the water treatment process or suspension of the use of the water if counts are too high.

The sources of nitrogen and phosphorus to water bodies are broadly similar, deriving from:

- soils in the catchment
- wastewater and sewage discharges such as septic tank leakage (especially nitrogen)
- fertilisers
- waterbird and other defecation
- releases from lake sediments if oxygen becomes depleted in overlying waters (in these circumstances nitrogen is released as ammonia).

Phosphorus is an essential nutrient in aquatic ecosystems, but high concentrations (especially filterable phosphorus) can result in algal blooms and consequent serious water quality problems. In the ACT region, phosphorus is the nutrient that commonly determines the amount of algae that can occur (described as a 'limiting factor') (ACT Government 2008). The Googong Catchment does not contain major point sources of phosphorus (e.g. sewage treatment plants or intensive agriculture) and similar to the rest of the upper Murrumbidgee Catchment, phosphorus most likely comes from subsoil material derived from channel erosion (Starr 1999). Inputs to the reservoir are therefore directly related to catchment condition and management.

Nitrogen is not generally a limiting factor in algal growth in the ACT region as blue-green algae are able to fix atmospheric nitrogen. Nitrogen is non-toxic to organisms. For this reason priority is given to minimising the input of phosphorus to waterways with nitrogen reduction a second priority (ACT Government 2008).

In the Googong Catchment, as well as eroded subsoil material, the other important potential source of nutrients is from rural residential development in the Burra and Urialla areas. Within Googong Foreshores, control of soil erosion and management of potential point sources of nutrients (e.g. toilets at picnic areas) will limit nutrient transport to the reservoir.

OBJECTIVE: EXCESS NUTRIENTS

- Nutrient levels in Googong Reservoir are maintained below levels that result in nuisance or toxic algal growth and conform to applicable nutrient standards or guidelines within the framework of the National Water Quality Management Strategy.

Policies

- Control of the potential for contamination of Googong Reservoir by excessive nutrient inputs will be given high priority in managing Googong Foreshores.

Actions

- Manage stock grazing and populations of native and feral animals to limit erosion and transport of nutrients (soil phosphorus and nutrients in faecal material) to Googong Reservoir.
- Document and investigate instances of excessive algal growth in the reservoir, with the aim of identifying nutrient sources. If there is evidence of sources within the Foreshores, undertake remedial action where this can be defined and is practicable. For nutrients suspected to have originated outside of the Foreshores, liaise with ActewAGL, NSW Government agencies and local government regarding potential sources and corrective measures.
- Monitor and maintain toilet facilities in the Foreshores to ensure that there is no leakage of nutrients to the catchment.

4.4.6 Chemicals and Hazardous Materials

A wide range of chemicals can be present in raw water and may be naturally occurring (e.g. mineral salts) or derive from use of chemicals in the catchment. Pesticides, herbicides and hydrocarbons are the main products considered here as these chemicals are the ones most likely to present a risk to water quality in Googong Reservoir. Potentially hazardous materials include asbestos building materials, synthetic mineral fibres and polychlorinated biphenyls (PCBs) (GHD 2007).

Pesticides and herbicides

For the purposes of the *Australian Drinking Water Guidelines* (NHMRC 2004), pesticides and herbicides are grouped with other agricultural chemicals as 'pesticides'. Pesticides are an example of contaminants that can be introduced to a water storage by improper use, accidental spillage in a catchment area, or by an intentional act to sabotage the water supply. They can be difficult, if not impossible, to remove by practicable water treatment processes. The *Guidelines* set out the method for control of pesticide use through a national scheme of registration, and recommend that their use in water or water catchments be authorised only when necessary. Pesticides not authorised for such use should not be present in drinking water. Use, handling, transport and storage of pesticides in Googong Foreshores should be related strictly to standards or guidelines and relevant legislation. Their use is mainly for control of plant and animal pests and for use in water treatment.

Given the level of settlement in the Googong Catchment, there is potential for contamination by agricultural chemicals. However, the types of land uses in the catchment and the low level, dispersed use of chemicals lessen the risk of contamination. One concern is the presence on rural properties of agricultural chemicals now banned from use. At the local government level, collection programs are undertaken for these chemicals with NSW State Government support (e.g. 'Household Hazardous Waste Collection' by Palerang Council). There is a national 'drumMUSTER' program for used chemical containers (see <http://www.drummuster.com.au>) and 'ChemClear®' program for agricultural and veterinary chemicals (see <http://www.chemclear.com.au>).

Hydrocarbons
Potential entry of hydrocarbons (in particular fuels and oils) to Googong Reservoir is mainly related to the use of internal combustion engines in the area. This potential is limited by the prohibition on public use of petroleum-fuelled powerboats. There is also only a small road network and this limits the potential for these materials to enter the reservoir from the use of motor vehicles.

Hazardous Materials
Hazardous materials are known to be present in some of the buildings at Googong Foreshores and asbestos may be present at sites where buildings were buried.

The potential for chemical contamination and the presence of hazardous materials in Googong Foreshores was included in studies undertaken prior to the signing of the Googong Lease (GHD 2007, 2008). As part of the Googong Lease negotiations, the ACT Government and ActewAGL have undertaken to implement recommendations deriving from these investigations as outlined, in summary form, in the actions below. Note that these include two actions associated with the water supply infrastructure and are, therefore, the responsibility of ActewAGL.

OBJECTIVE: CHEMICALS
- Chemicals and hazardous materials at Googong Foreshores are managed so that they present minimal risks to reservoir water quality and human health.
- Chemicals present in Googong Reservoir are in concentrations below applicable raw water standards or guidelines within the framework of the National Water Quality Management Strategy.

Policies
- Chemical use within Googong Foreshores will be kept to the minimum necessary to undertake management functions.
- Control of the potential for chemical contamination of Googong Reservoir will be given high priority in managing Googong Foreshores.
- ActewAGL will be advised of any chemical spills, including hydrocarbons in car park areas.

Actions
- As far as practicable, only use chemicals outside an appropriate buffer distance from the reservoir and away from catchment drainage lines. Use of chemicals for weed control in riparian and shoreline areas (e.g. blackberry control) will be carried out at times when water is not being extracted from the reservoir.
- Minimise chemical usage by application of Integrated Pest Management techniques, and select chemicals and application methods that will have least environmental impact, including impact on reservoir water.
- Use only chemicals that have been approved for use in water catchments.
- Establish protocols for advising ActewAGL when pesticides are in use, as well as reporting protocols for accidental spills.
- Manage the use, handling, transport and storage of chemicals in accordance with industry best practice, relevant NSW legislation, and ACT Government procedures and protocols.
- Ensure that all Googong staff are trained in the safe use of chemicals, including emergency management procedures.

- Identify, remove or replace any scheduled ozone depleting substances held at the Foreshores.
- Water Treatment Plant – underground fuel storage tanks (Actew AGL):
  - Immediate cessation of use of Tank 1; removal of contents; removal of tank and associated fuel lines; remediation of adjacent contaminated soil. Any contaminated perched groundwater that is encountered in the excavations of remediated soil should be collected for off-site disposal.
  - Unless there is a clear reason to retain, remove Tank 2.
  - Undertake groundwater investigations to determine whether there is an actual or potential significant risk of harm, and evaluate the need for groundwater remediation at this location.
- Water Treatment Plant – sludge drying bed discharge point and clarifier tank discharge point (ActewAGL):
  - Determine and advise the Commonwealth and ACT governments regarding possible actions to minimise the discharge of aluminium and zinc into the environment.
- Ranger Station – underground fuel storage tanks (ACT Government):
  - Immediate cessation of use of Tank 3; removal of contents; removal of tank and associated fuel lines; remediation of adjacent contaminated soil. Any contaminated perched groundwater that is encountered in the excavations of remediated soil should be collected for off-site disposal.
  - Unless there is a clear reason to retain, remove Tank 4.
  - Undertake groundwater investigations to determine whether there is an actual or potential significant risk of harm, and evaluate the need for groundwater remediation at this location.
- Ranger Station – other areas (ACT Government):
  - Undertake an audit and prepare a hazardous substances register for dangerous goods and hazardous building materials.
- London Bridge Woolshed – sheep dip (ACT Government):
  - Manage the sheep dip area to minimise exposure of visitors to the arsenic contaminated soils.
  - Prior to any redevelopment or disturbance at the site, undertake further investigation to assess the extent and degree of contamination, to guide the management of any contaminated soils that would be disturbed by the development.
- Buried Former Homesteads (ACT Government):
  - Prepare a site management plan to manage areas that may contain buried former homesteads at the southern end of the Foreshores, including homesteads at London Bridge and Tin Hut, and other demolished buildings along the Burra Road.
  - Ensure these areas are investigated prior to any excavation or other earth-moving activities.

Chapter 5 Recreation

5.1 Recreation: Primary Management Objective

Googong Foreshores provides a variety of recreational opportunities that are consistent with the protection of the water supply catchment, reservoir water quality, and natural and cultural heritage values.

5.2 Recreational Use of Water Supply Storages

Recreational use of water supply catchments and reservoirs is generally prohibited or restricted in Australia as it potentially impacts on water quality. The most effective means of assuring drinking water quality and protection of public health is through adoption of a preventive management approach that encompasses all steps in water production from the catchment to the consumer. The key aspect of this approach is the establishment of measures to prevent contamination of water in the form of multiple barriers. These barriers may be grouped into those that operate prior to extraction of the water (catchment management and source water protection, detention in protected reservoirs or storages) and those in place from the point of extraction (extraction management, treatment, distribution). The strength of this approach is that a failure of one barrier may be compensated by the effective operation of the remaining barriers (NHMRC 2004, Ch. 3).

The focus of preventive measures depends upon the characteristics of the source water. For those Australian urban areas where water is sourced primarily from protected upland catchments (e.g. Melbourne, Sydney) the emphasis is on maintaining prevention of contamination at the source. In contrast, this is not possible for Adelaide, which draws water from multiple use catchments and the Murray River, and therefore must heavily weight barriers towards water treatment.

In the ACT, the Cotter Catchment has a relatively high level of protection due to its largely undisturbed character. The potential for water supply from the Queanbeyan River Catchment was recognised in choosing the site of the national capital (e.g. granting of paramount water rights to the Commonwealth) and under the Seat of Government Act, NSW is obligated to protect the waters from pollution. As discussed in Chapter 2, Googong Reservoir is established in a catchment that is adversely affected by a range of rural land uses and is under pressure for the expansion of rural residential development (Contos et al. 2008). From its inception, weighting had to be given to treatment of the water. More recently, urban development has been approved, adjacent to the boundary of the Foreshores (s. 2.3). The land involved is mostly outside the catchment of the reservoir; however, there are potentially significant impacts of such a development through increased recreational and access pressures.

An important aspect of the first set of barriers (catchment management, source protection and reservoir detention) is control of access and activities that potentially threaten water quality. Catchments may be completely closed with no human or livestock access (e.g. forested catchments of Melbourne Water) or allow some controlled public access (e.g. Cotter Catchment where permitted access is defined in a management plan (ACT Government 2010b)). Reflecting its particular circumstances (see s. 5.3), the level of recreational access at Googong Foreshores is greater than that found in comparable Australian metropolitan catchments and storages, with only Brisbane permitting similar levels of access (Water Futures/CRCWQT 2004).

Recreational access to catchments can be a contentious issue, and where permitted, involves trade-offs between public amenity and public safety (contamination of the water supply) and require an appropriate risk management strategy (Appendix 2). The types of recreational activities, their permitted locations, numbers of people involved and the provision of facilities need to be considered. Such recreational planning means that some activities will be allowed, others prohibited and all will be subject to restrictions. An important aspect of managing recreational use in a water supply catchment is making users aware of that primary purpose and the need to adjust their behaviour accordingly.

5.3 Development of Recreational Policies for Googong Foreshores

At the time the Googong Dam was being constructed in 1977, government agencies involved with the project formulated a program for the development of recreation in Googong Foreshores including the waters of the reservoir. It was decided to develop and manage the area for multiple-use, based around the primary water supply purpose (Department of the Capital Territory 1979). This decision was influenced by the need to treat the water before supply due to the occupied catchment, overseas trends in use of water supply reservoirs, and an expected increase in water based recreational demand. Recreational activities would be limited, phased in over time and evaluated, and management zones established.

The Foreshores was opened to visitors in 1979 commencing a six-stage program. In 1980 hand launched non-powered boats were permitted on the reservoir and vehicle access was opened to the southern Foreshores (Woolshed area). In 1982 small electric powered boats were permitted on the reservoir. From 1980 a fish stocking program was undertaken (Shorthouse 1983). The directions outlined in the Department of Capital Territory Report in 1979 and the subsequent staged introduction of recreational activities provided an enduring basis for management of recreation in the Foreshores over the following two decades.

Current management of recreational use at Googong Foreshores, in order to protect reservoir water quality, is influenced by a number of factors that are still evolving, namely:

- the enhanced role of Googong Reservoir for the ACT and Queanbeyan water supply
- more stringent management of the risks to potable water supply (a global trend)
- intensification of residential settlement in close proximity to the Foreshores, in particular, the adjacent 'Googong New Town' development
- pressures that climate change may place on the management of water resources in the region.

The established pattern and level of recreational use are considered sustainable as there is no evidence of significant environmental impact from these activities at present. To ensure that recreational activities continue to be managed at a sustainable level, the ACT Government will incorporate the principles defined in s. 2.8 into management of the Foreshores. The basis of such management is sound planning, regular monitoring, provision of educational material, limitations on access, and regulation of activities where necessary. It is a condition of the Googong Lease (Clause 4.1(e)) that the Foreshores must only be used for the existing type of recreational use occurring in the area at the time of the signing of the lease (Commonwealth of Australia 2008). This management plan aims to maintain the established pattern and level of recreational use at Googong Foreshores

(s. 5.4.1), but recognises that recreational pressures will increase, related to regional population growth and developments on the boundary of the Foreshores.

5.4 Recreational Use

Although the primary function of Googong Foreshores is urban water supply, the area has developed into a recreational resource of considerable value to the residents of Canberra, Queanbeyan and adjacent areas. It is intended that recreational use of Googong Foreshores remains low-key with a matching level of facilities. Fishing is the most popular activity and swimming (below the dam), walking, mountain bike riding, picnicking and nature based activities such as bird-watching are also popular. In the southern section of the Foreshores, London Bridge Natural Arch (limestone formation) and London Bridge Homestead attract many visitors. Visitor numbers to the Foreshores have been recorded by automatic road sensor since 1992, averaging 53 000 annually. Lowest numbers (23 000) were in the drought conditions of 2003, when boat access was limited. The highest visitor numbers were in 1996, with 72 000 recorded. Visitor numbers will inevitably increase as nearby residential developments proceed.

As well as the constraints imposed by existing recreational policies and associated access and infrastructure, the potential for recreation is partly determined by the local environment. The eastern part of the Foreshores area is steep, rugged and relatively inaccessible country. The waters of the reservoir are extremely cold in winter, fogs are common and the prevailing winds are from the north-west and therefore towards the inaccessible eastern shores.

An important aspect of the development of recreational use of Googong Foreshores has been the acceptance by visitors of limitations on the types of activities allowed, restrictions on access to some areas, the provision of relatively low-key recreational facilities, and the opening of the area for day use only. Opening hours are extended during the daylight-saving period in summer. Opening hours for the reserve will be dependant on available resources to adequately monitor and regulate recreational use. When the gates are closed, members of the public are not permitted into the reserve, even on foot.

Incidences of unauthorised access (outside opening hours) currently occur at Googong Foreshores and there could be an increase in this problem from the planned urban development on the boundary. Should such access, and inappropriate activities, put at risk the protection of reservoir water quality, water supply infrastructure and management assets, it may be necessary to enhance protection measures and/or adopt more restrictive access policies, as apply in other water supply catchments.

OBJECTIVES: RECREATIONAL USE

- Googong Foreshores is used for recreational activities that: (a) do not conflict with the primary water supply purpose of the area, and (b) are compatible with the conservation of the natural and cultural values of the area.
- Visitor access and facilities are provided that support appropriate recreational activities and enhance visitor experiences, consistent with the protection of water quality and the other values of Googong Foreshores.

5.4.1 Recreational Activities

The main recreational activities occurring at Googong Foreshores are discussed briefly below. Policies for specific recreational activities, permitted activities in management zones defined for the Foreshores, and prohibited activities are shown in Table 5.1.

Policies

- Recreational use of Googong Foreshores will be managed so that the primary purpose of water supply is not adversely affected by recreational activities. This will involve prohibition of certain activities and strict controls over others.
- Recreational use of Googong Foreshores will be managed so that the natural and cultural heritage values are conserved.
- Management of Googong Foreshores will seek to maintain the established pattern and level of recreational use.

a) Fishing

Fishing is the most popular recreational activity at Googong Foreshores, evident by the drop in visitor numbers in the drought period 2002–2005 when the (low) water level was inaccessible from the boat ramp. Only non-motorised boats or those with electric motors are allowed on the reservoir.

Historically, the Queanbeyan River supported good numbers of 'cod' and perch' (Lintermans 2002) and prior to the construction of Googong Dam was a popular trout fishery. Macquarie perch (*Macquaria australasica*) were also still present in the river at that time. Googong Reservoir has been managed as a mixed fishery with stocking of native and alien species. Stocking commenced in 1980 with brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*) (ACT Parks and Conservation Service 1988). Rainbow trout have been regularly stocked since that time; however, the stocking of brown trout was discontinued in 1997 due to concern for conservation of threatened native fish species. Native fish stocked are Murray cod (*Maccullochella peelii peelii*), golden perch (*Macquaria ambigua*) and silver perch (*Bidyanus bidyanus*). The alien redfin perch (*Perca fluviatilis*) is present in the reservoir and is sought by anglers. Though there have been some captures and unconfirmed sightings, carp (*Cyprinus carpio*) have not yet established in the reservoir (Lintermans 2002).

The Googong fishery is jointly managed by the NSW Department of Primary Industries and the ACT Government, with both governments providing fish stocks. Fish stocking activities (species and numbers stocked) are consistent with and guided by the Fish Stocking Plan for the ACT 2009–2014 (ACT Government 2009). New South Wales fisheries legislation applies to the area and fishers require a NSW fishing licence. The waters within Googong Foreshores are declared 'trout waters' and the reservoir is open to fishing all year round. River sections and tributaries outside of the reservoir waters are subject to a closed season from the end of the long weekend in June to the beginning of the long weekend in October. A closed season for Murray cod applies from 1 September to 30 November inclusive. Macquarie perch (see s. 6.5) are totally protected and must not be taken. Information on fishing regulations is provided in publicity brochures and on signs at Googong Foreshores.

b) Boating

Conventional powerboats (i.e. those using petroleum fuels) are prohibited on Googong Reservoir. The only exceptions to this are boats used for: (a) management purposes; (b) water supply management (e.g. water quality monitoring); and (c) emergency purposes

such as rescue. Such craft should be maintained to a high standard and use motors with the lowest possible hydrocarbon input to the waterway. The prohibition on recreational use of petroleum-fuelled powerboats is based on the potential risk to water quality in the reservoir. Conventional water treatment plants, such as the one at Googong, are not capable of removing hydrocarbons. In addition, conventional powerboats have a much greater capacity to create turbidity through wash and propeller agitation.

Boats with electric motors and non-motorised craft such as rowing boats, sailing boats, canoes and kayaks are permitted on the reservoir. Windsurfers and surf skis are not permitted given the high level of body contact with the water by users of these craft.

It is common for boats using electric motors on Googong Reservoir to have been designed mainly for use with petrol engines (usually outboard motors). Many have fuel lines and fixed fuel tanks or containers. In some instances fuel motors may be cumbersome to remove. While still requiring that an electric motor be used, these boats will be allowed on the reservoir with such fittings, provided that boat operators ensure that the fittings are secure and do not leak fuel into reservoir waters. Random inspections will be undertaken of such craft.

Most boat use is for fishing but there is a low level of other use e.g. recreational canoeing and kayaking. The only public boat ramp at the Foreshores is at Drumstick Point, which accesses the open northern waters of the reservoir. Boats can be launched near Tin Hut car park in the southern section of the Foreshores, but must be carried or wheeled by hand 300 m to the water's edge. A number of factors limit non-powered boat use, in particular, lack of easy access to the more protected southern section of the reservoir, prevailing wind conditions, and cold water (winter and spring) that can make conditions unsafe. There is no water rescue patrol or service; though a conventional powerboat is maintained for management and emergency purposes. New South Wales Maritime boating regulations apply to reservoir waters. In addition, a permit issued by the ACT Government is required to operate a boat on Googong Reservoir.

c) Walking

There are no data on use of the Foreshores for walking, which is a popular activity in the area. A number of short and long walks have been developed some of which lead to particular attractions (Figure 5.1). These are shown in the *Googong Foreshores: Map and Guide* brochure.

d) Bike Riding

Cycling at Googong Foreshores is restricted to formed roads and vehicle tracks. Two tracks are particularly suitable for mountain bike riding: the Western Foreshores track from the Foreshores Car Park to Tin Hut Car Park; and the Queanbeyan River Loop, in the south-eastern part of the Foreshores.

e) Picnicking

This is a popular activity at Googong Foreshores and may be associated with other activities such as swimming at the Cascades, walking to London Bridge Arch or viewing the dam and waters from the northern lookouts. Picnic and barbecue facilities (wood (Downstream Picnic Area only, wood provided), gas or gravel pads for visitors' own barbecues depending upon location) have been provided at the Downstream Picnic Area and Foreshores Car Park in the northern section of the Foreshores, and at London Bridge Woolshed and Tin Hut in the south.

f) Birdwatching (and similar nature based activities)
Googong Foreshores provides a range of habitats for birds including waterbirds and raptors and birdwatching is an attraction of the area.

g) Visiting Natural and Cultural Heritage Sites
The limestone formation of London Bridge Arch, reached by a short walk from London Bridge Car Park is a particular attraction in the southern section of the Foreshores. London Bridge Homestead is reached by a longer walk. The homestead is surrounded by a security fence but is open to the public on regular open days. Near the London Bridge Car Park, the woolshed (with evidence of a lever wool press), the more recent shearers' quarters and remnant large woodland trees provide an attractive picnic area.

h) Swimming
Swimming is a popular activity in the Queanbeyan River downstream of the dam wall especially at the Cascades. Swimming is not permitted in the reservoir.

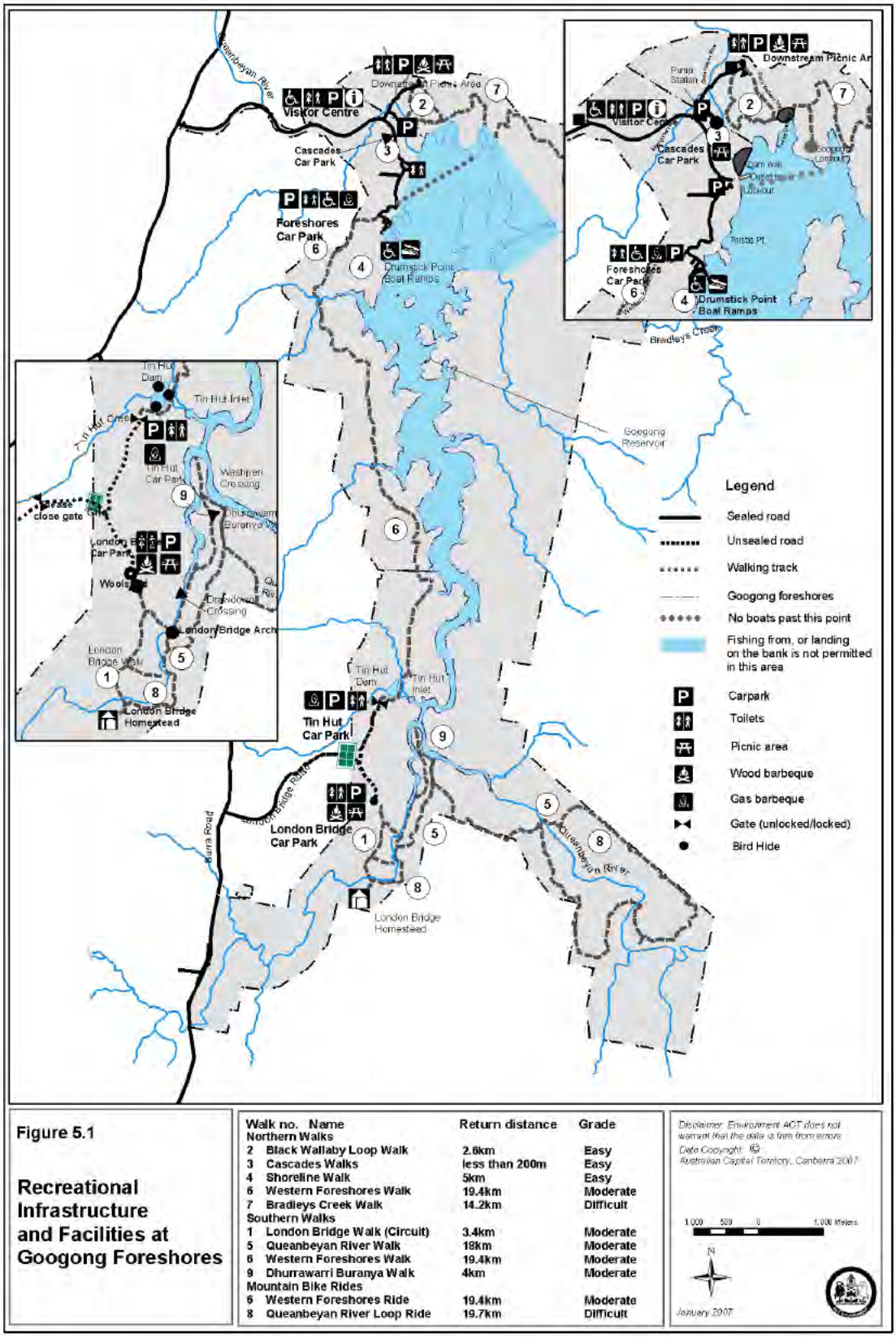

Figure 5.1 Recreational infrastructure and facilities at Googong Foreshores

Table 5.1 Policies for recreational activities and permitted activities in Googong Foreshores management zones

Recreational Activity and Policy	Zone 1 Restricted	Zone 2 Low Impact recreation	Zone 3 Serviced Recreation areas
Permitted Activities			
Fishing Fishing will be permitted and appropriate (limited) facilities provided. NSW fishing regulations apply to the Foreshores.	Zone 1A and 1B No fishing from shore.	Yes: Zone 2C: Reservoir waters only	N/A
Boating Public use of conventional powerboats (i.e. those using petroleum fuels) is not permitted on Googong Reservoir. Non-powered boats and boats with electric motors will be permitted on the reservoir, subject to the regulations of NSW Maritime. A permit issued by the ACT Government is required to operate a powered boat on Googong Reservoir. (Conventional powerboats are used for management, water supply and emergency purposes.)	Zone 1A: No landing on shore. Boats must not enter the area between the boom and dam wall.	Yes: Zone 2C: Reservoir waters	N/A
Walking Walking will be encouraged on designated walking tracks, formed vehicle roads and tracks, and appropriate facilities provided.	Zone 1A: No. Zone 1B: Not encouraged. No facilities or information.	Zone 2A: Yes. Zone 2B: Not encouraged. No facilities or information.	Yes
Bike Riding Bike riding will be permitted on formed vehicle roads or tracks.	Zone 1A: No. Zone 1B: Not encouraged. No facilities or information.	Yes Zone 2A.	Yes: Zone 3A: Sealed access road. Yes Zone 3B.
Picnicking Picnicking will be encouraged and appropriate facilities provided. Rubbish bins are not provided and signs request visitors to take their rubbish with them. Lighting fires is restricted to barbecue facilities and prohibited when fire risk is high (s. 5.4.3).	No	No	Yes: Zone 3A/3B
Birdwatching (and similar nature based activities) Birdwatching (and similar nature based activities) will be encouraged and supported.	Zone 1A: Yes. No landing on shore.	Yes	Yes
Visiting Natural and Cultural Heritage Sites	No	No	Yes: Zone 3B

Recreational Activity and Policy	Zone 1 Restricted	Zone 2 Low Impact recreation	Zone 3 Serviced Recreation areas
Visiting natural and cultural heritage sites will be encouraged and appropriate facilities and interpretative information provided (including requirements for protection of the sites). Access to particular Aboriginal heritage sites may be restricted or not promoted due to their cultural sensitivity.			
Swimming Swimming will be permitted only in the Queanbeyan River downstream of the dam wall with appropriate warning signs as to the changing conditions due to possible fluctuations in temperature and flow.	No	No	Zone 3A
Prohibited Activities			
Camping Prohibited because of potential to adversely affect water quality. As part of securing the water storage, Googong Foreshores is closed at night.	No	No	No
Boating (petroleum-fuel powered boats) Prohibited because of potential to adversely impact on water quality (hydrocarbons, turbidity derived from wash and propeller action). (Note: Prohibition does not apply to boats used for management, water supply and emergency purposes.)	No	No	No
Trail Bike Riding and Off-road Vehicle Use Prohibited because of potential to adversely affect water quality. Maintenance of boundary fencing is important.	No	No	No
Horse Riding Prohibited because of potential to adversely affect water quality and natural heritage values and to conflict with other activities.	No	No	No
Bringing Pets (dogs, cats) Prohibited because of potential to adversely affect water quality and natural heritage values and to conflict with other activities. Guide dogs are permitted.	No	No	No
Windsurfing, Surf Ski Use Prohibited because of potential to adversely affect water quality through body contact.	No	No	No
Water skiing, Wakeboarding Not applicable due to prohibition on recreational use of conventional powerboats, as well as prohibition on body contact recreation in the waters of the reservoir.	No	No	No
Events and groups: Permit requirements			
Events	No	Permit required	Yes

Recreational Activity and Policy	Zone 1 Restricted	Zone 2 Low Impact recreation	Zone 3 Serviced Recreation areas
Small, low-key events only, may be permitted subject to consultation with ActewAGL (if water quality implications need to be ascertained[1]). These will require the written approval of the manager of Googong Foreshores, which may contain specific conditions. Approval will only be given if the event accords with the management objectives; does not have the potential to adversely affect water quality or impact on other values; and where event organisers have agreed to conditions proposed by management. Large events will not be permitted. 1 An example would be a fishing competition on the reservoir. Consultation would not be required for an open day at London Bridge Homestead.		from NSW waterways for Zone 2A and 2C.	
Commercial guided activities May be permitted, subject to consultation with ActewAGL (if water quality implications need to be ascertained), and with written approval of the manager of Googong Foreshores. Approval may contain specific conditions. Approval will only be given if the activity accords with management objectives and policies; does not have the potential to adversely affect water quality; or impact on other values. Approval will be in accordance with current policies for commercial operators in areas managed by the ACT Government.	No	Yes	Yes
Non-commercial groups No permit required. Any activity needs to accord with the management objectives for the Foreshores and it should not have the potential to adversely affect water quality or impact on other values. For large groups, the manager of Googong Foreshores should be advised and ActewAGL consulted (if water quality implications need to be ascertained). Access for groups to the London Bridge Homestead can be arranged through the Ranger Station.	No	Yes	Yes
Educational Tours and Activities No permit required. Encouraged, provided that the activity accords with the management objectives and policies, does not have the potential to adversely affect water quality, or impact on other values. The manager of Googong Foreshores should be advised and ActewAGL consulted if it is proposed to include the water supply function in the tour.	No	Yes	Yes

In relation to the policies detailed in Table 5.1, management actions where required are outlined in Table 5.2.

Table 5.2 Management actions related to policies for recreational activities at Googong Foreshores

Activity	Actions
Permitted Activities	
Fishing	(a) Provide information in brochures and signs on requirements for fishing (including permitted bait, bag limits, closed seasons, threatened species, permitted boats and gear, safety information and emergency contacts). Advise that NSW fishing regulations apply. (b) Maintain the fish stocking program in conjunction with the NSW Department of Primary Industries. (c) Undertake inspections to ensure that fishers comply with the NSW fishing regulations.
Boating	(a) Provide information in brochures, signs and at the Ranger Station on requirements for boating and boating safety (noting that the waters can be dangerous and that there is no patrol but an emergency rescue service is provided). (b) Provide information in brochures and signs on restrictions applying to Zone 1A. (c) Advise boat users that NSW Maritime boating regulations apply and a permit issued by the ACT Government is required to operate a powered boat on Googong Reservoir. (d) Maintain the prohibition on the use of conventional powerboats on Googong Reservoir (except those used for management, water supply, or emergency purposes). (e) Ensure that the disabled car park near the Drumstick Point boat ramp can accommodate vehicles and trailers in accordance with Australian Standards. (f) Maintain the current boat access arrangements (main ramp at Drumstick Point, hand launching at end of access path from Tin Hut car park). (Boating is normally permitted at all times when the Reserve is open, see s. 5.4). (g) Provide information on avoiding the transfer of aquatic weed species from other waterways to the reservoir. (h) Maintain toilet facilities near the boat ramp.
Walking	(a) Provide information in brochures and signs on walking opportunities and information regarding hazards to water quality from not using toilet facilities.
Cycling	(a) Provide information in brochures and signs on cycling opportunities. (b) Advise that cycling is permitted on roads and vehicle tracks (fire trails) but is not permitted on foot tracks.
Picnicking	(a) Provide information in brochures and signs on availability of picnic and barbecue facilities. (b) Advise that the lighting of fires is prohibited, except in wood fireplaces. (c) Advise that barbecues (wood or portable gas) cannot be used when there is a Very High or Extreme Fire Danger. (d) Do not provide rubbish bins. Maintain signs indicating that no bins are provided and visitors are to take their rubbish home. (e) Maintain toilet facilities at high use picnic areas.
Birdwatching (and similar nature based activities)	(a) Provide information as appropriate in brochures and signs on birdwatching and similar nature based activities. (b) Maintain the facilities and information at Tin Hut Dam for birdwatching.
Visiting Natural and Cultural Heritage Sites	(a) Provide information in brochures and signs on natural and cultural heritage sites including requirements for their protection. Inform visitors that the area is a Wildlife Refuge under NSW legislation and that some sites are nominated to/ or placed on the Commonwealth Heritage List and protected under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth). (b) Maintain security fencing around London Bridge Homestead and continue regular public open days. (c) Restrict or do not promote access to particular Aboriginal heritage sites if this is

Activity	Actions
	required due to their cultural sensitivity and/or vulnerable to accidental or deliberate damage.
Swimming	(a) Provide information in brochures and signs on the permitted location for swimming (Queanbeyan River, downstream of the dam wall), and prohibition on swimming elsewhere in Googong Foreshores. (b) Install a warning sign that jumping and diving from rocks at the Cascades is not permitted, and advising of the hazards of changing water temperatures and flow conditions.
Prohibited Activities	
Listed in Table 5.1	(a) Provide information in brochures and signs on activities that are prohibited. Provide explanation as appropriate.

5.4.2 Recreational Facilities

Recreational facilities at Googong Foreshores have been developed progressively since the area was opened for recreation. Facilities are suited to low-key day use and the most developed facilities are located below the dam wall (Zone 3A) or away from the reservoir shoreline (Zone 3B). The main facilities are roads and vehicle tracks, car parks, walking tracks, picnic and barbecue areas, a sealed boat ramp (Drumstick Point), toilets, information signs, bird hides and screens, lookouts and the Ranger Station (Googong Dam Road). Rubbish bins are not provided at Googong Foreshores and signs advise visitors to take their rubbish with them when they leave.

This type and level of facilities is appropriate to the objectives for recreational use of the Googong Foreshores and expansion of the facilities is not proposed, except to improve functioning or performance.

Policies

- Visitor facilities will be provided that are appropriate to the management of Googong Foreshores for low-key day use recreation.
- Visitor facilities will be provided that support permitted recreational activities and enhance visitor experiences.
- Visitor facilities will be designed and maintained to minimise impacts on reservoir water quality and other values of Googong Foreshores.

Actions

- Assess the likely impact on water quality in Googong Reservoir arising from upgrades or changes to existing facilities.
- Maintain all visitor facilities to a high standard, including visitor information.
- Provide appropriate access and facilities for visitors with disabilities (this may not be practicable in all areas).

5.4.3 Recreational Impacts

All visits to Googong Foreshores potentially have an impact. An important role of management is to assist visitors in making that impact negligible. Impacts may be physical (e.g. contamination of the reservoir water, disturbance to wildlife, removal of items from cultural heritage places) and/or social (effects on the enjoyment of other visitors). Visitor behaviour and purpose, numbers, frequency of use, and site characteristics are factors that influence impacts and the necessary management approaches. For Googong Foreshores a key consideration is the understanding by visitors

of the primary water supply purpose of the area and how certain activities and behaviour might compromise the maintenance of water quality.

The increased importance of the Googong water supply and future pressures from urban growth (s. 5.3) will require increased focus on monitoring and managing recreational impacts. Recreational policies at Googong to date have excluded many activities and facilities that typically require major management input, such as built accommodation, camping areas, four-wheel drive touring, overnight bushwalking and camping, and active and high impact recreational activities (e.g. power boating, scenic driving).

Policies

- Threats to reservoir water quality and the conservation of natural and cultural values will be key considerations in evaluating recreational impacts.
- Recreation management in the Foreshores will be informed by monitoring.
- The Foreshores will be maintained as a day use area with the two existing access points closed by locked gates at night.

Actions

- Manage recreational activities to minimise (a) the risk of body contact with reservoir water (see s. 5.4.1 and s. 5.4.2 above) and (b) the potential for erosion and transport of sediments to the reservoir
- Provide information about appropriate behaviour (including good hygiene practices) to protect water quality.
- Manage recreational activities to minimise impact on natural and cultural values by controlling access, educating visitors, providing protection measures, and monitoring.

5.4.4 Visitor Safety

There is some level of risk associated with all recreational activities. Risk is not an absolute in itself, as the competency of those undertaking the activity is a significant factor in mitigating the risk. Outdoor pursuits sometimes require critical judgements to be made, which are based on a combination of skills, knowledge and experience. The duty of Googong management is to identify foreseeable risks and take reasonable steps to reduce them, particularly for people who may not be capable of recognising the risk or the magnitude of the risk. However, managers cannot take complete responsibility for the safety of those who visit Googong.

The most significant risks at Googong Foreshores are those associated with boating, in particular, drowning and hypothermia (potentially in association with one another). There are also risks associated with swimming in the Queanbeyan River below the dam wall, in particular, injury or drowning related to jumping or diving from rocks at the Cascades, being swept downstream during high flows, and hypothermia due to cold water temperatures.

The hazards of boating on Googong Reservoir have been noted in s. 5.4.1(b) and the required management actions in Table 5.2. This may be particularly important to: (a) boat users who are unfamiliar with the area and weather conditions, (b) those venturing onto the water in winter and spring, and (c) those using a boat with no mechanical power source (e.g. canoe or kayak). It is important that boat users plan for the worst conditions and are properly equipped as there is no water rescue patrol or service. Information on boating safety is provided in the *Googong Foreshores: Map and Guide* and signs.

Policies

- Information will be provided to visitors to Googong Foreshores on the more significant risks associated with their visit. Particular attention will be given to boating safety.

Actions

- Provide information in brochures, signs and at the Ranger Station on boating safety (repeat of Action in Table 5.2).
- Install a warning sign that jumping and diving from rocks at the Cascades is discouraged, and the hazards of changes in flow (repeat of Action in Table 5.2).
- Maintain limitations on lighting fires (only in barbecues provided), the prohibition on use of barbecues when there is a very high or extreme fire danger, and closure of the Foreshores on total fire ban days (s. 9.1.5).
- Provide appropriate advice (e.g. warning signs) if undertaking pest animal baiting or other activities using chemicals.
- Provide contact/emergency contact phone numbers on signs and other information material.

5.5 Tourism

Tourism refers to visits to Googong Foreshores by people from other parts of Australia or other countries that is social, cultural or recreational in nature. This is different to local or regional recreational use. While Googong Foreshores might be included in the range of attractions to visitors to the ACT and region, the area will not be specifically marketed as a tourist destination. This is in keeping with the area's primary purpose, the low-key nature of recreation activities undertaken there, and the management policy of maintaining recreational use of the Foreshores at the established level.

Policies

- Specific programs to promote Googong Foreshores for tourism and to increase visitor numbers will not be undertaken, in accordance with the primary water supply purpose, conditions of the Googong Lease, and the low-key nature of recreational activities in the area.

Chapter 6 Natural Values

6.1 Natural Values: Primary Management Objectives

- **The biodiversity, geodiversity and landscape values of Googong Foreshores are conserved.**
- **Ecosystems are managed so that they continue to function and evolve naturally and the integrity of landscapes and scenery is protected.**

6.2 Biodiversity and Geodiversity

6.2.1 Biodiversity

Googong Foreshores contains an extensive area of intact forest and woodland, a diversity of habitats, threatened plant and animal species, and distinctive geological and geomorphological features. There are about 3000 ha of relatively intact open forest and woodland, mainly along the eastern escarpment, and about 1500 ha of partly cleared former grazing land, in which regeneration is occurring, to the west of the reservoir. Vegetation west and south of the reservoir has been the most disturbed, having been used for sheep grazing over the period 1857 to 1973. During this period the original tree cover was extensively cleared. Much of the floristic diversity of the eastern escarpment appears to be associated with the riverine and riparian habitats of gullies, creeks and rivers, and with the healthy understorey of the higher slopes. The Foreshores contains remnants of two threatened ecological communities (natural temperate grassland and white box – yellow box – Blakely's red gum grassy woodland) and a number of threatened and regionally uncommon plant and animal species (Table 6.2). Vegetation survey and mapping has been undertaken in the Foreshores, but is incomplete. For sound long term management of vegetation and habitat, comprehensive vegetation survey and mapping should be undertaken as the basis for a vegetation management plan for the Foreshores (s. 6.4.3).

As part of establishing baseline conditions for the Googong Lease, the Commonwealth prepared assessments of biodiversity (GHD 2007) and natural heritage values (ERM Australia 2008b) at the Foreshores in relation to the EPBC Act. The information available on flora and fauna when these reports were prepared was insufficient to determine whether the natural heritage values of the area would satisfy the criteria for listing on the Commonwealth Heritage List (ERM Australia 2008b, 2008c). In 2009, a survey and assessment of the location, condition and status of areas identified as potential natural temperate grassland and white box – yellow box – Blakely's red gum grassy woodland was undertaken (Eddy 2009). This survey concluded that a large proportion of the target area meets at least the minimum criteria for listing under the EPBC Act as one of these threatened communities. This analysis will contribute to a subsequent assessment by the Commonwealth for the purposes of the Commonwealth Heritage List.

The following statement of significance for natural heritage values was prepared by ERM Australia (2008c: p. 26). It was a statement of potential natural significance pending the outcome of the grassland and woodland survey (above):

> Googong Foreshores contains a diverse array of ecological communities and associated flora and fauna, including a significant number of threatened and/or rare species and endangered ecological communities (EECs). The presence of rare and threatened flora and