

SECTION 1: WATER RESOURCES

Water Resource Use

For the period 1 July 2006–30 June 2007 the *Water Resources Act 1998* (the Act) was the current mechanism the Australian Capital Territory used to regulate its water resources. The Act provided for the preparation of Environmental Flow Guidelines used to determine flows necessary to protect all ACT water bodies. These guidelines are reviewed every five years. The first review has been recently completed with revised Environmental Flow Guidelines available at http://www.tams.act.gov.au/live/environment/water/environmental_flows .

The Act also required the preparation of a *Water Resources Management Plan*, which was included in the policy strategy document *Think water, act water*. The *Water Resources Management Plan* described the water resources of the Territory, quantified environmental flows on the basis of the Environmental Flow Guidelines, identified water available for use, and identified the volumes of water that were being used and those available for allocation.

Water allocations were only issued in accordance with this plan and thus ensured that the total quantity of water that could be used from ACT water resources was sustainable. Licence conditions are used to ensure that water allocations are only taken from ACT water resources when and where the water is available. These measures ensure the Territory's water resources are managed appropriately. Water catchments boundaries used for this purpose are set out in Figure 2.

The Act makes it clear that control of all water use in the Territory is vested in the Territory. This means that a licence to take water is needed to use groundwater, water from streams and rivers and water from dams. The taking of surface water for stock and domestic purposes, where water is collected from the lessee's property or where their property directly abuts a waterway, does not require a licence. ACTEW hold a licence to take water and so customers of ACTEW are not required to hold a licence to take water when using water supplied by ACTEW.

Since 1 August 2007, the Water Resources Act 2007 has commenced. This Act supersedes the Water Resources Act 1998. However, since the reporting period of this report relates to 1 July 2006–30 June 2007, reference to the Water Resources Act 1998 occurs.

Fostering Sustainable Water Resource Use Through Regulation

The Minister generally issues Water Allocations (Table 2) and the Environment Protection Authority (EPA) issues Licences to Take Water (Table 3) Bore Construction Permits and Water Control Structure Permits (needed for construction of dams), subject to conditions and volume considerations. Together these controls allow the EPA to manage the use of water resources in an environmentally sensitive manner. For example, when issuing a licence to take water, a major consideration of the EPA is whether the water needed is within the sustainable limits for the subcatchment, as specified in the Water Resource Management Plan (*Think water, act water volume 3, 2004*). Full details of Water related allocations, licences and permits issued by the EPA are available for inspection in the Water Resource Act Register. Appointments for inspection can be made by contacting 13 22 81.

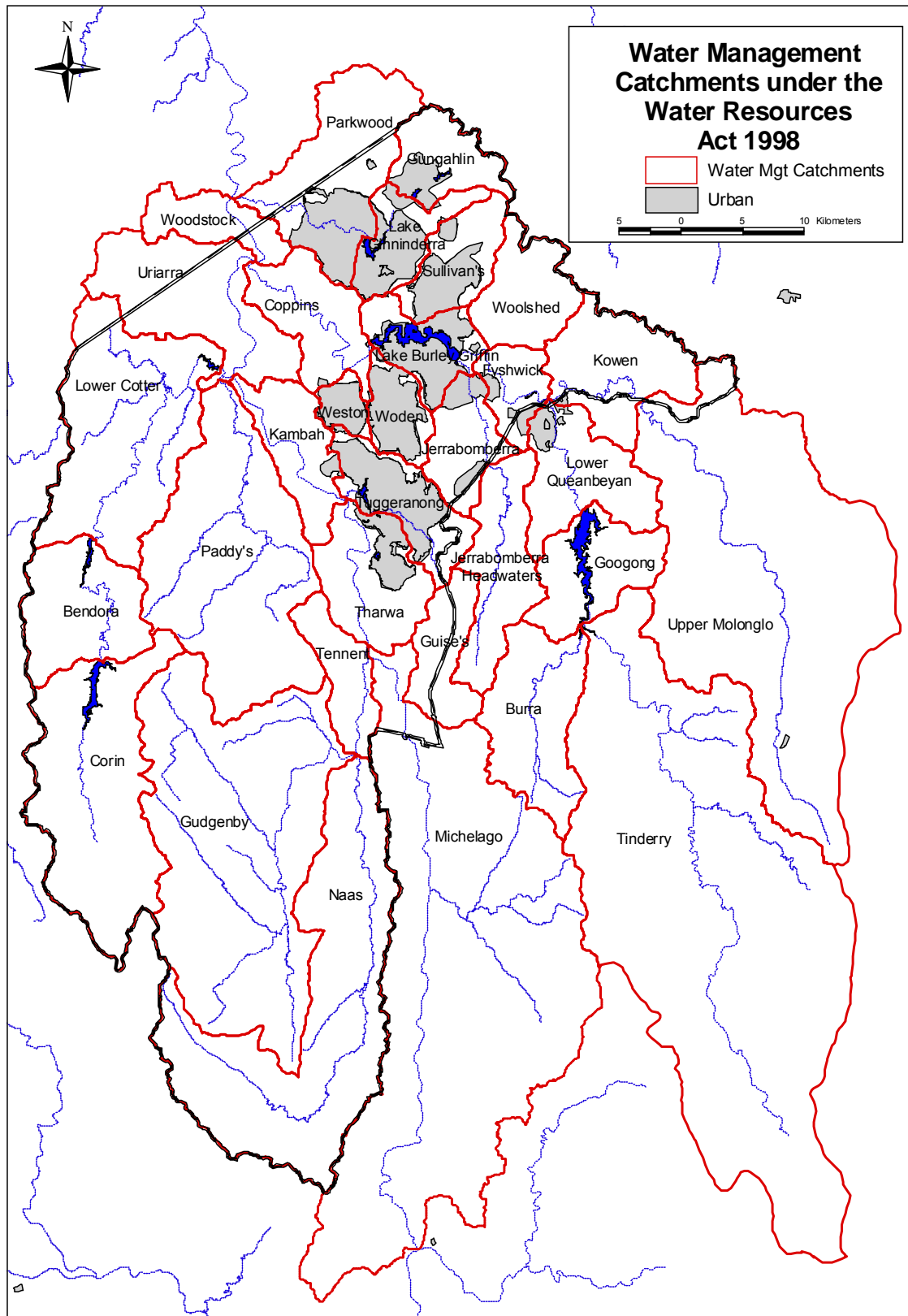


Figure 2: Boundaries of Water Management Catchments Under the *Water Resources Act 1998*.

Water Allocations

During this reporting period there has been a total of eleven allocations issued as a result of lease surrender/re-grant by existing licence holders. The granting of allocations for new or additional volumes of water was restricted during this period by the moratorium. The superscript in the table below (subcatchment column) indicates the number of allocations granted within each subcatchment. The table shows that Gunghalin and Lake Ginninderra had more than one allocation granted. All allocations in this reporting period were granted to facilitate projects on public land that have significant Water Sensitive Urban Design and water efficiency elements incorporated into its infrastructure design.

Table 2. The number of allocations and allocated water volume within ACT subcatchments.

Subcatchment	Number of Allocations	Allocated Water Volume (ML)
Bendora	1	21000
Burra	1	1600
Coppins ¹	2	91
Corin	1	29700
Fyshwick	15	130
Googong	1	1200
Gudgenby	2	18
Guises	1	2
Gungahlin ³	5	388
Jerrabomberra ¹	4	66
Kambah	2	194
Kowen	1	2
Lake Burley Griffin ¹	3	98
Lake Ginninderra ²	6	320
Michelago	0	0
Naas	0	0
Paddys	3	79
Parkwood	1	12
Sullivans	5	349.5
Tennent	0	0
Tharwa ¹	9	94
Tinderry	5	10280
Tuggeranong	2	55
Uriarra ¹	3	85
Weston	2	11
Woden ¹	3	41
Woolshed	6	141
Total	84	65956.5

Note: an allocation is not necessary under the *Water Resources Act 1998* where groundwater is taken from a lease that is dated before 11 December 1998, although a Licence to Take Water is required. Consequently the total licensed volume in Table 3 is larger than the total allocated volume in Table 2.

Licences to Take Water

There has continued to be a demand for water licences during this reporting period, predominantly within urban subcatchments. This is likely to be caused by the continued implementation of water restrictions on mains water use and the increase in Water Abstraction Charges for potable water. However, there was a restriction on granting access to new or augmented use of water during the moratorium period, as the development of a more equitable approach for allocating water continues. Four multiple use surface water licences and five specified licences (two for groundwater only, two for surface water only and one for surface and groundwater) were issued in the reporting period.

Table 3: The number of Licences to Take Water by subcatchment and water type. * These subcatchments include volumes from ACTEW's licence for potable water supply.

Subcatchment	Number of Licences to Take Water			Total Licenced Volume (ML)
	Groundwater (only)	Surface Water (only)	Surface + Groundwater	
Bendora*		1		21000
Burra*		1		1600
Coppins	2			13
Corin*		1		29700
Fyshwick	9	11	1	1231
Googong*		1		1200
Gudgenby	1	1	1	31
Guises	2			4
Gungahlin	1	2	1	352
Jerrabomberra	5	1	1	251
Kambah	2		1	203
Kowen	2			6
Lake Burley Griffin	58			77.5
Lake Ginninderra	4	1	1	231
Naas	1			2
Paddys	2	2	1	119
Parkwood	4			21
Sullivans	5	1	2	370.5
Tennent	2			3
Tharwa	5	3		58
Tinderry*		1		10280
Tuggeranong	3	1		56.5
Upper Molonglo	1			2
Uriarra		2	2	85
Weston	5			24
Woden	3	1		189
Woolshed	3	3	2	222
Multiple use		4		129
Total	120	38	13	67461.5

Note: while the table above is definitive in its depiction of total licenced volume of water in the ACT, it is recognised that there may still be unlicensed bores in use and existing licence holders may exceed their licenced volume. There is a monitoring and compliance program in place to address these issues.

Climate and Water Resources

The availability of the ACT's water resources is influenced by rainfall. Groundwater recharge in the ACT's low yield fractured rock aquifers is closely linked to recent rainfall history, unlike other groundwater sources such as the great artesian basin, which has stored rainfall from millions of years ago. Stream flow in waterways arising within the ACT, including the Cotter River and Ginninderra Creek, is directly linked to local rainfall. Stream flow in the Murrumbidgee and Molonglo Rivers crossing the ACT includes additional contributions from substantial areas of their catchment outside the ACT.

Rainfall in the ACT is strongly affected by the landform. In the mountainous region to the west of the Murrumbidgee River, annual average rainfall ranges from 800-1000 mm. The flatter tablelands on which Canberra is built are in a rain shadow area and the annual rainfall reaches 600-700 mm. In this 12-month reporting period Canberra's annual average rainfall was 432.6 mm, well below last year's 629 mm and only 70% of (186 mm less than) the long-term average for Canberra Airport of 619.3 mm.

Two of the sites in the ACT where rainfall is measured that directly correlate with stream flow, and so demonstrate the rainfall and landform interaction, are Charnwood Road and Cotter Hut. Rainfall in an urban area (Charnwood Road in Belconnen) and in a water supply catchment area (Cotter Hut, above Corin Reservoir) is depicted in Figure 3. Both the long-term average monthly rainfall from data collected since 1990, and the monthly rainfall for the 2006-2007 reporting period are presented.

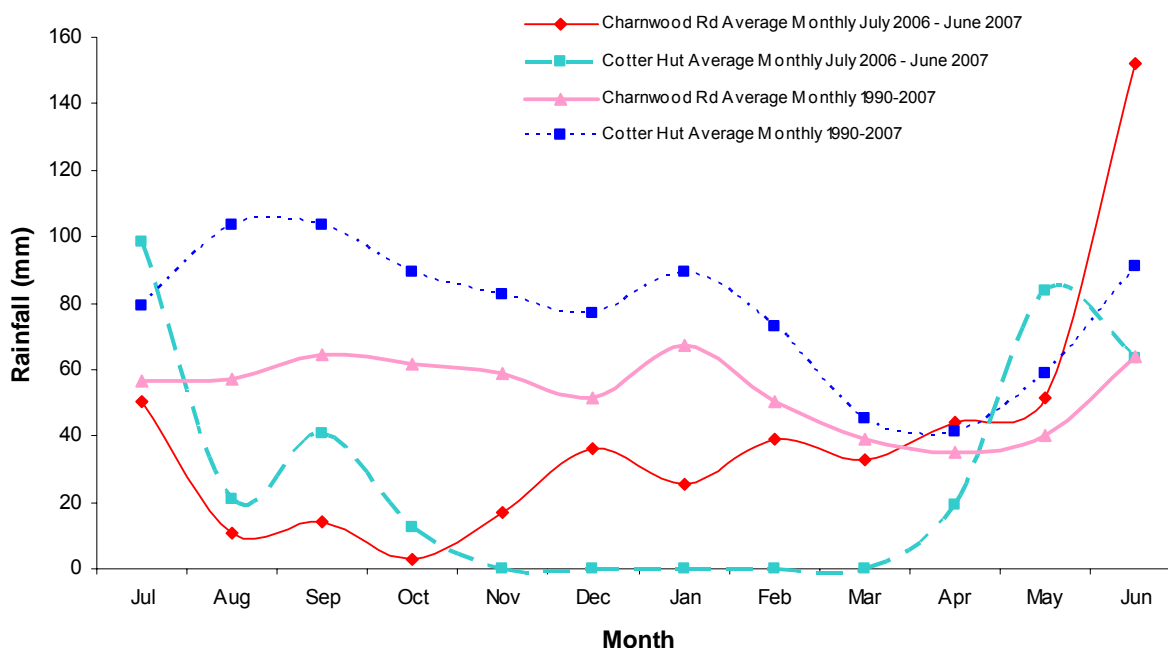


Figure 3. Comparison of 2006-2007 average monthly rainfalls in Belconnen near Charnwood Road and Cotter Hut in the Corin Reservoir Catchment with the long term average monthly rainfall.

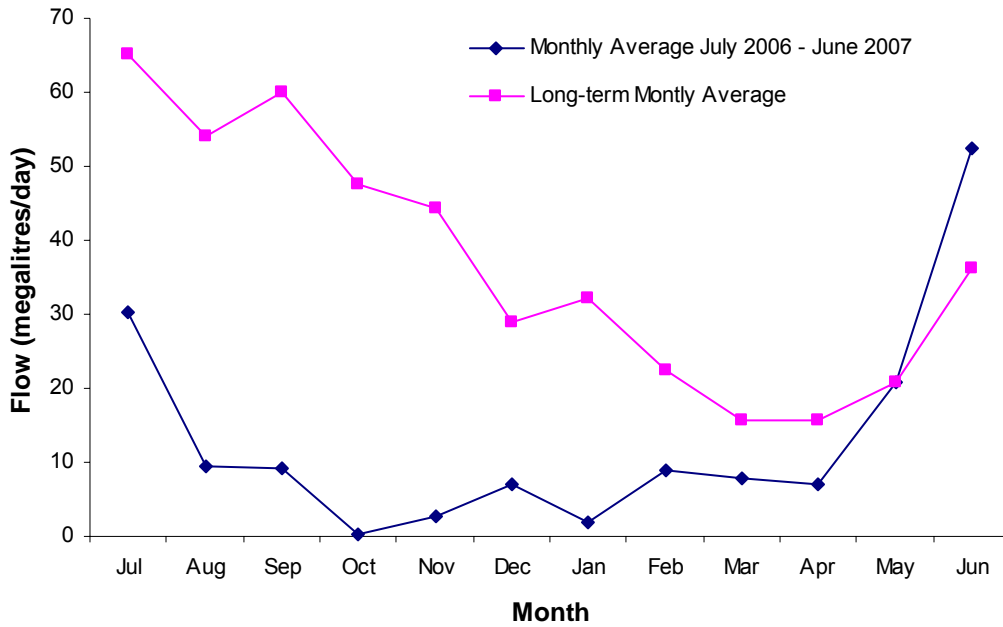


Figure 4. Average monthly flow July 2006 to June 2007 in Ginninderra Creek (410750) upstream of Charnwood Road compared with the long-term average monthly flow for that site.

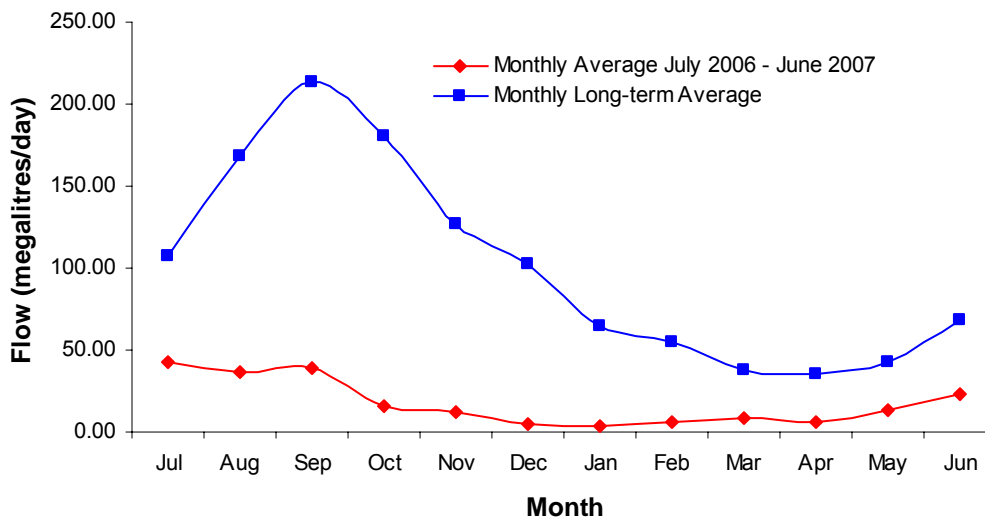


Figure 5. A comparison of the average monthly flow (July 2006–June 2007) to the long-term average monthly flow for a site upstream of Corin Reservoir.

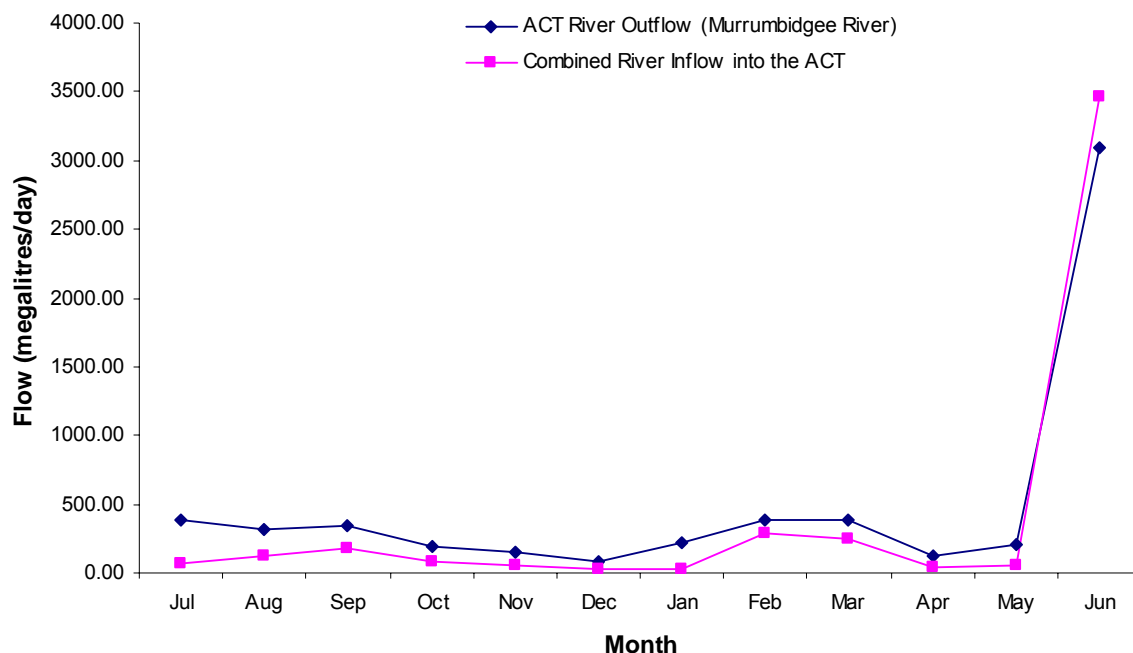


Figure 6. A comparison of the average monthly inflows into the ACT (combined monthly data for the Murrumbidgee, Molonglo and Queanbeyan Rivers) with the average monthly outflows from the ACT (Murrumbidgee River, just after the downstream exit of the ACT border, at Hall Crossing) for the July 2006 to June 2007 period.

The long-term average annual rainfall since 1990 in Belconnen at the Charnwood Road site is 645mm and the annual rainfall for this reporting period, 1 July 2006 to 30 June 2007, was 74% of the long term average at 475 mm. The site at Cotter Hut has a long-term annual rainfall of 932 mm and for this reporting period the total rainfall was 338 mm, only 36% of average rainfall with almost no rain reported between November 2006 and March 2007. This below average rainfall follows the 2005-2006 below average rainfall. Sustained above average rainfall would be needed to refill the water supply reservoirs.

Patterns in the stream hydrograph for the urban area (Figure 4) closely reflected rainfall patterns at Belconnen (Figure 3). A similar pattern is evident for the water catchment (Figure 5) and the absence of a spike in flow in May indicates the run-off from the good May rains soaked into the ground. Overall stream flow for the urban area was well below the long-term average and remained below the average until the June rains in the urban catchment. In the water catchment it had not reached the long term average flow rates by the end of the reporting period, as the reservoirs were so low that most run-off was retained. Ginninderra Creek, which drains a highly urbanised catchment with large areas of impervious surfaces, showed quick responses to the high rainfalls occurring in autumn and winter (Figure 4).

The ACT remains a net exporter of water into the Murrumbidgee River, even in a year with low rainfall and when inflow and outflow were equally, and historically, depressed. A comparison of the volume of water flowing (in the case of the Queanbeyan River water that would flow if not for Googong Dam) into the ACT with the volume of water leaving the ACT is shown in Figure 6. There was little or no flow from October 2006 to January 2007. It is worth noting that both the Murrumbidgee at Angle Crossing and the Ginninderra at Charnwood Road showed little or no flow between October 2002 and January/February 2003, a similar very low rainfall period just prior to the fires (ACT Water Report 2002-2003).