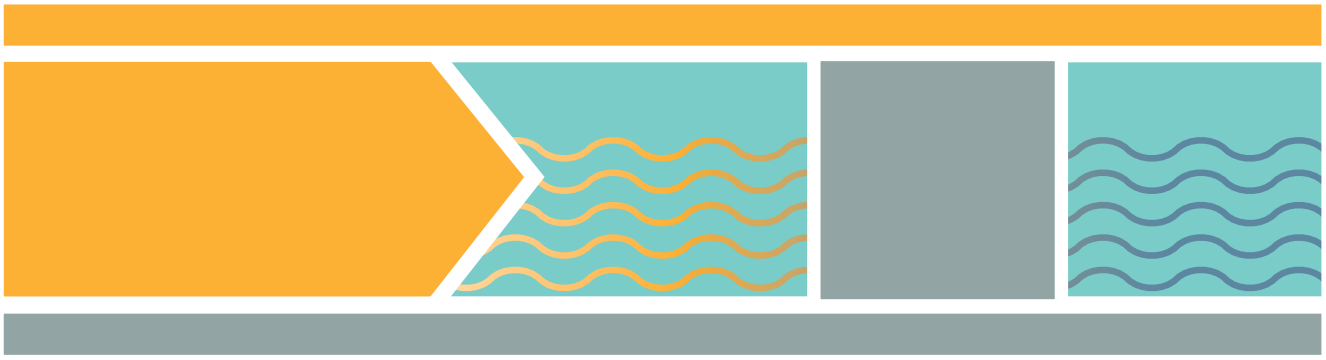
Water sharing in unregulated rivers

Progress report 2004 to 2008



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Introduction

Twenty water sharing plans (WSPs) for unregulated water sources commenced across NSW on 1 July 2004. These plans contain rules for how water is to be shared between the environment and water users and between water users in those water sources. In the four years, from 2004 to 2008, there has been progress in implementing the provisions within the plans. This report includes an overview of the current risk based approach to implementation of water sharing in unregulated rivers and summarises key activities arising from the implementation of these plans.

A new approach to water planning

The first 20 water sharing plans were developed with advice from river management committees involving a range of stakeholders from State government agencies, local government, industry, environmental groups, Aboriginal communities and water users. Whilst the advice from the Committees was an important input to the planning process, this approach was very slow and costly. The government has consequently adopted a broader, more efficient “macro” planning approach to water planning, which will result in plans for the remaining unregulated rivers in NSW (approximately 600 water sources).

The macro planning approach takes into account economic, social and environmental requirements. It is a risk based approach where the intensity of water management is linked to the risk to the water dependent ecosystems and the communities that depend on them. This risk assessment takes into account:

- instream values (threatened species) and the risk posed by existing or increased extraction,
- hydrological stress (the amount of water extracted relative to flow)
- extraction value (economic value of water)
- economic dependence
- sensitivity of the estuary to increased extraction
- town water supplies
- existing water sharing rules
- NSW Government policy.

Communities still have opportunity to comment on these plans through targeted consultation sessions and public display of the final draft plan.

For more information on the macro planning approach see the Department’s website www.dwe.nsw.gov.au.

Implementation priorities

In 2007, the Department of Water and Energy (DWE) reviewed all of the initial 20 unregulated river water sharing plans using the macro planning risk assessment process. Implementation priorities for these plans have now been re-aligned in accordance with the outcome of the risk-assessment process. Table 1 shows the results of this assessment.

The water sources that have been identified as having high community dependence on water and at high risk to ecosystem values (category C in Table 1) will receive priority for implementation activities

that assist in protecting flows for the environment and sharing access to flows (equitable access for water users) by providing a higher level of management.

Table 1: Risk assessment for unregulated WSPs commenced in 2004 following review of environmental risk by DWE and community dependence by DPI

High Environmental Risk	**A**	**B** Upper Karuah (part of Karuah plan)	**C** Coopers Kangaroo Dorrigo Tenterfield
Medium Environmental Risk	**D**	**E** Mammy Johnsons (part of Karuah plan) Central Karuah (part of Karuah plan) Upper Brunswick	**F** Commissioners Jilliby (assessed as part of Wyong macro) Adelong Tarcutta Ourimbah
Low Environmental Risk	**G** Aspley Toorumbee Upper Billabong Lower Karuah and Port Stephens (part of Karuah plan)	**H** Wandella Mandagery Lower Horton Rocky, Cobbadah, Upper Horton Blicks (part of Dorrigo plan) Castlereagh above Binnaway	**I** Mooki (part of Philips et al plan) Wybong Philips, Quirindi, Warrah
	Low Community Dependence	**Medium Community Dependence**	**High Community Dependence**

Water for the environment

Managing to extraction limits

All unregulated river water sharing plans establish a long term average extraction limit (LTAEL). This limit applies to the whole catchment or extraction management unit that the water source is a part of (eg. the extraction limit is set for the Macleay of which the Apsley unregulated river water source is a part). This limit is equal to the sum of the existing (active component only in inland systems) water entitlements, an estimate of basic landholder rights, and a sum of water for growth (the last two do not apply inland). Water above this limit is protected from extraction and is identified in the plans as planned environmental water.

The extremely dry conditions since the plans commenced have meant that water use has been well below the limits set in the plans.

Protecting very low flows

All unregulated river water sharing plans set cease to pump (CtP) levels that are aimed at protecting pools and river flows from extraction by most users during times of very low flows. The plans identify water in this flow class (less an allowance for basic landholder rights and limited licensed stock and domestic use) as planned environmental water.

The management of these rules relies on an appropriate gauge for measuring local flows that are sometimes supplemented by a visible flow rule at a nominated point within the water source. Since the commencement of the WSPs, all existing gauges have been maintained. New telemetered gauges (that measure flow automatically) required to implement the plans were established in Dorrigo, Karuah and Phillips / Mooki. Nine staff gauges (that rely on manual reading of flows) were also established in three plan areas, namely Tenterfield, Rocky, Cobbadah, Lower and Upper Horton, and Tarcutta. The Department will continue to review all unregulated river Plans annually and assess the need for additional gauges, and ensure appropriate calibration of the gauges with flow reference points.

Both the Castlereagh and Mandagery Plans established a number of management zones within the water source. The Department has yet to establish flow reference points at the beginning of each management zone to facilitate this. Until these are in place, visible flow rules are being used to protect very low flows within each management zone.

In 2006, two of the 20 initial unregulated river water sharing plans were suspended due to the severe drought. In the Wybong water source, where the irrigators had been subject to the CtP rules in excess of 200 days, visible flow rules were applied at key locations within the water source to protect pools whilst providing limited access by licence holders to water.

In the Ourimbah water source, where drought had caused a critical shortage of water for the Gosford Wyong Joint Town Water Supply, the CtP rule was decreased to a visible flow rule, allowing access to the very low flows. Additionally the weir environmental release volume was decreased to enable the town water supply to access more water during the drought.

Other water users were also subject to visible flow rules. Both of these water sources were identified as having communities that are highly dependent on water and the Ourimbah as at medium risk to environmental values.

The drought over the past four years has been more pronounced in inland Australia. The difference in coastal and inland flow variation can be observed by Figures 1 and 2. These figures show that the CtP has been triggered in Adelong (inland) a larger percentage of the time than in Jilliby (coastal), where it has not been triggered at all. During the period from October 2006 until April 2007 the CtP level was reached the majority of the time in Adelong, during summer, when water demand is usually the highest. Additionally coastal rainfall during 2007–08 has seen Jilliby return to higher variability in flows and much higher flows than in the previous four years.

Figure 1: Mean hourly Adelong Flows at Gauging Station during July 2004 to June 2008 and CtP trigger.

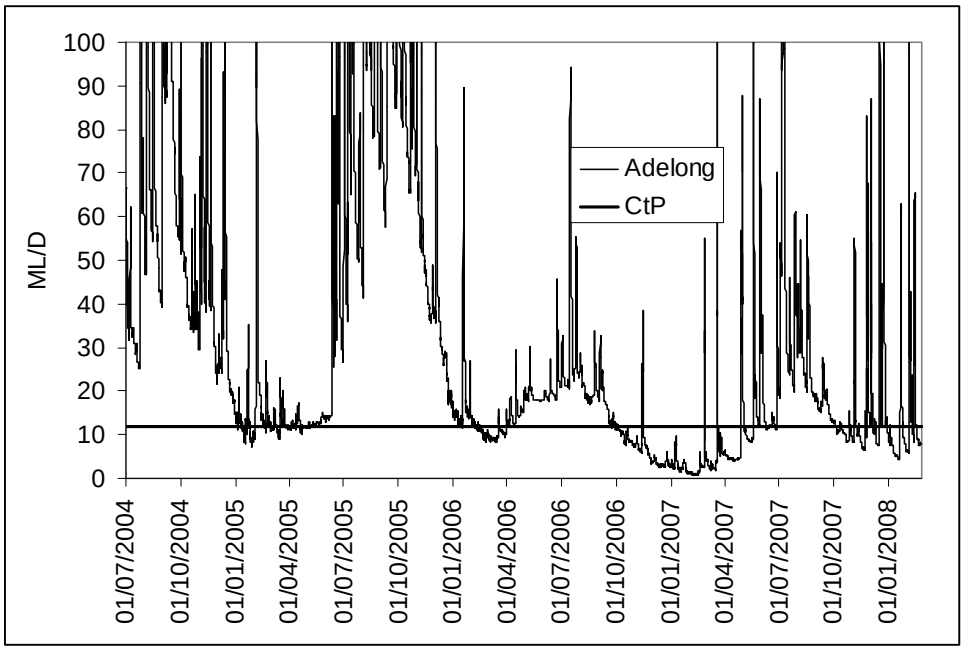
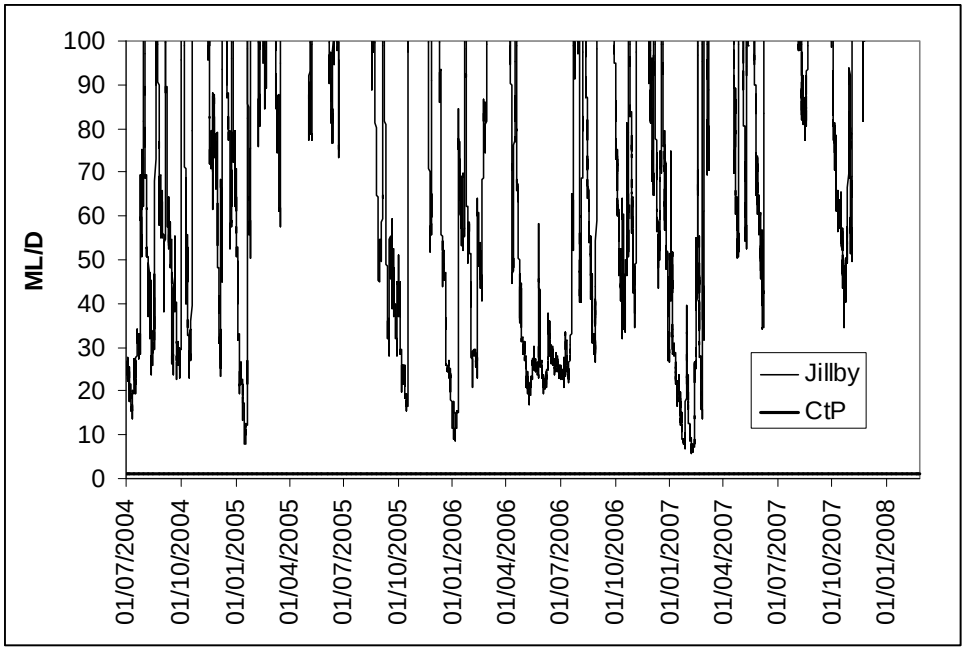


Figure 2: Mean hourly Jilliby Flows at Gauging Station during July 2004 to June 2008 and CtP trigger



Daily flow sharing

All unregulated river water sharing plans also provided for a limit to extraction for various flows or flow classes. These rules, known as daily flow sharing rules, were aimed at protecting the variability of river flows, important for river health, whilst still providing access by towns, irrigators, and other water users to water. The ban on pumping (ie. CtP rules) when flows drop to the very low flow class is the first stage of implementing daily flow sharing.

Full implementation of daily flow sharing rules requires monitoring of water use (or metering), the establishment of daily extraction limits (IDEL) for individual licence holders and the total daily extraction limit (TDEL) for each flow class, and the establishment of a system to announce the flow class for a particular day.

Daily flow sharing was intended to be phased in for most unregulated water sharing plans. Full daily flow sharing has not, however, commenced in any unregulated water sharing plan areas.

Following the risk assessment process for these plans, discussed above, it is likely that implementation of daily flow shares will be prioritised, with those Plans where there is high community dependence and high risk to dependent ecosystems (ie. category C in Table 1) first to be implemented.

As a first step, assessment of suitable sites and water use monitoring methods has been completed for the Tenterfield, Castlereagh, Mooki, and Karuah unregulated river water sources. Water use monitoring has been introduced in the Adelong unregulated river water source.

The Department is still developing the system for announcing daily flow classes. Until this system is fully operational, interim arrangements are in place for the CtP announcements that rely on manual water level reading by water users and their internal water source communication strategy. In the Karuah, Wybong, Ourimbah and Jilliby unregulated river water sources, water users have access to the Hunter Integrated Telemetry System (HITS), that enables internet access to real time flow information for the primary control gauges. Other plan areas can also access daily flow information through the NSW water information website (www.waterinfo.nsw.gov.au), however not all unregulated primary control gauge information is available.

Adaptive environmental water

The WSP allows for licence holders to nominate their licence as Adaptive Environmental Water. Once a nomination has been processed, the entitlement cannot be used for any purpose other than environmental benefit, outlined in an Adaptive Environmental Water Use Plan.

There are no unregulated river access licences nominated as adaptive environmental water anywhere in NSW.

Clear water rights and trading

The Plan establishes rules for how water is shared between extractive users. Information on access licences, including conditions, entitlements, available water announcements and trading is available on public registers established by the Department in 2004 (website reference www.dwe.nsw.gov.au)

Basic rights

The Plan provides for water to satisfy basic landholder rights. No access licences are issued for these. This category of user can extract at levels below the CtP, provided the water is used for private domestic purposes. The Department is finalising rules for ensuring that water accessed by basic landholder rights users is being used “reasonably”, particularly during dry times.

Dry conditions since the commencement of the plans, have meant that water for basic rights holders has been curtailed when there has been no visible flow.

Access licences

Share entitlements for access licences within all the unregulated river water sources were estimated at the commencement for each Plan. Prior to the commencement of the Plan, the Department converted 1,126 licences issued for the 20 unregulated river water sources under the *Water Act 1912* to licences and approvals under the *Water Management Act 2000*.

In all unregulated river sources, new entitlements can only be granted for a small number of exempt purposes listed in the WSPs.

Consequently, there have only been minor changes in licensed entitlements in unregulated rivers recorded in the Department's register over the past four years. Entitlements have increased by less than four per cent in Commissioners Waters, Coopers Creek, Dorrigo, Jilliby Jilliby Creek, Karuah, Ourimbah, Tarcutta. In the Upper Brunswick, the increase in entitlement was approximately nine per cent on a relatively small initial entitlement and was due solely to the finalisation of volumetric conversion of licences.

In the Adelong, total entitlement for unregulated access licences decreased by 30 megalitres (ML) per share or less than one per cent over this four year period.

Available Water Determinations

An Available Water Determination (AWD) is the volume of water that is made available to a category of access licence, subject to water availability. Announcements are made at the start of the water year for each category of licence. These are maximum volumes that may be extracted and actual use is subject to water availability.

For 2004–05 a special AWD of 2 ML per share or volume was made for unregulated river access licences in 18 of the 20 water sources which commenced in this year to accord with previous agreed rules. This, combined with the carryover rules introduced in the plans, enables licence holders to use up to twice their water allocation in a year provided that over a consecutive three year period they do not exceed the sum of their water allocations for those three years. An AWD of 1 ML per share was made in each of the following three years.

Water markets

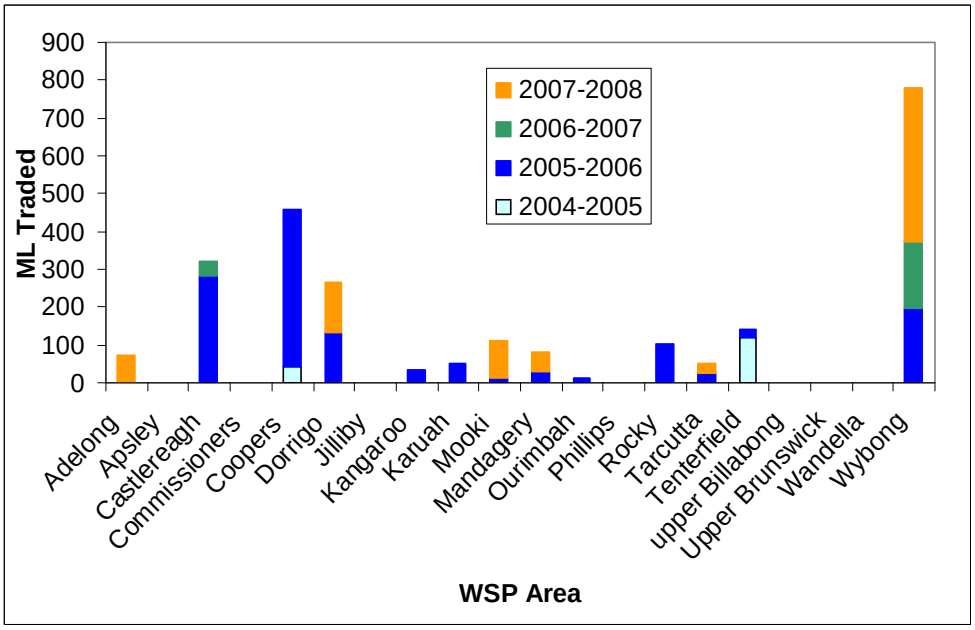
Limited permanent transfers of water licences in NSW in unregulated streams were introduced prior to 2004, however, these markets were not as active as those that operated for the more valuable, well established regulated river licences. Prior to the commencement of the WSPs, there were no temporary transfers of licences in these water sources.

The implementation of the WSP has involved removal of barriers to the efficient operation of these water markets, facilitating more efficient and better informed trades. Key mechanisms include clear rules for trading (in the WSP), the separation of the water licence from the land title in 2004, and the establishment by the Department of Water and Energy of public registers in 2004, showing the volume and price paid for access licences.

From July 2004 permanent trading has occurred in 13 of the 20 plan areas (Figure 3). Most of the trading (24 trades) occurred during the water year 2005–-06 with 15 trades undertaken in the Wybong plan area over the past four years. The maximum price paid for a share of water was $2,333 in the Wybong system within the 2007–08 water year.

Temporary transfers in water licences require monitoring of water extracted, and operation of an accounting system. Only Adelong has monitoring of water use that is currently occurring but no temporary transfers have occurred due to the lack of an accounting system.

Figure 3: Permanent transfers unregulated rivers July 2004 to June 2008



Compliance

DWE has developed a statewide compliance policy that outlines strategies for the reporting, auditing, monitoring and investigation of compliance activities. The Department also undertakes periodic compliance spot checks to audit water user compliance with their licences conditions. This has mainly involved assessment of compliance with pumping restrictions and is important to ensure equitable access for water users.

Monitoring

All plans require an assessment by 2014 of their effectiveness in achieving the stated objectives. This assessment relies on monitoring and modelling ecological, economic and cultural indicators. The Department has developed methods for long term monitoring of plans for review in the final year of the Plan. An explanation of the ecological monitoring methodology can be found at www.dwe.nsw.gov.au.

The ecological monitoring program currently assesses the Plan rules in protecting river processes or attributes affected by water extraction. The project comprises four parts at present, these being:

- Low flow running water habitats
- River refugia
- Fish passage
- Predictive ecological modelling.

The program is developing a series of *predictive ecological models* to assess the impacts of water extraction on the invertebrate and fish assemblages of unregulated rivers. Two pilot studies have been undertaken to develop methods and a number of scientific papers have been developed and published. These papers provide the supporting evidence that the methods are suitable for monitoring the plans.

The *low flow running water* habitats project has also resulted in published papers and information from these studies has been used to undertake a pilot verification of the low flow rules for the Kangaroo River plan area. The pilot study is currently being evaluated and the outcomes assessed for socio-economic impact.

Most of the plans have a provision where the very low flow class (CtP) may be amended within an agreed range that was negotiated by the river management committees. In order for this to occur *field verifications* such as those described above are required.

The protection of *river refugia* in periods of no or low flow in unregulated rivers is a stated objective in many of the plans, a pilot study, and associated research projects to evaluate the utilisation of these habitats has been initiated. For example, a bio-energetics study of Purple Spotted Gudgeon has been commissioned, to assist in evaluating the impact of pool draw down rules in ephemeral systems in western NSW. The field component of this project is being established.

Two fish species have been targeted for the *fish passage monitoring* (Figure 4) in unregulated rivers, i) Australian Bass and ii) Eastern Freshwater Cod. Both species are identified in the existing plans and have very different life history and thus environmental water requirements. Field studies have commenced for both species, in the Shoalhaven and Richmond river catchments. These studies will provide information in setting rules that allow for fish movement during discharge events, and the study on the Australian Bass has already provided some preliminary information on the magnitude of events required for fish movement.

Figure 4: Defining the river discharge thresholds for the passage of Australian Bass.