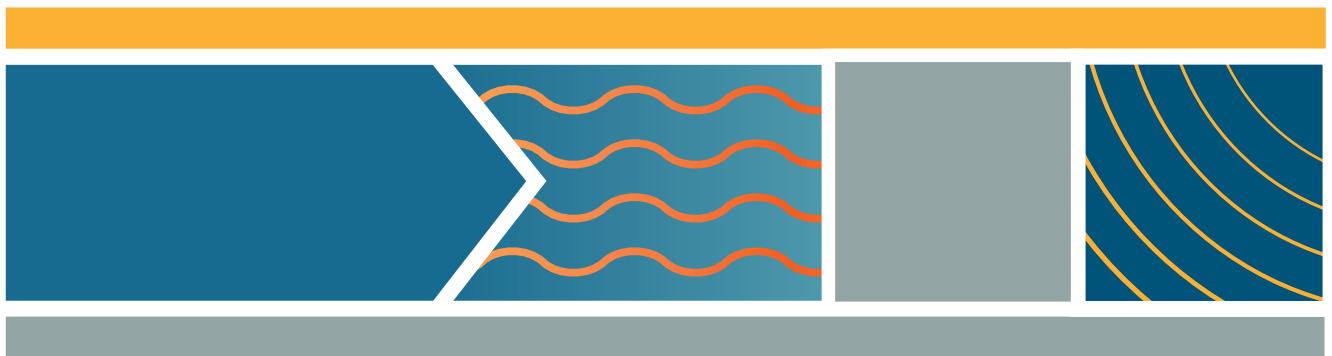


Water sharing in the Upper and Lower Namoi Regulated Rivers

Progress report 2004 to 2008



Publisher

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Introduction

A water sharing plan (WSP) for the Upper and Lower Namoi Regulated River Water Source commenced on 1 July 2004. This Plan contains rules for how water is shared between the environment and water users and different categories of licences. In the four years, from 2004 to 2008, there has been significant progress in implementing the strategies detailed in the Plan. This report summarises key activities arising from implementation of the Namoi Water Sharing Plan.

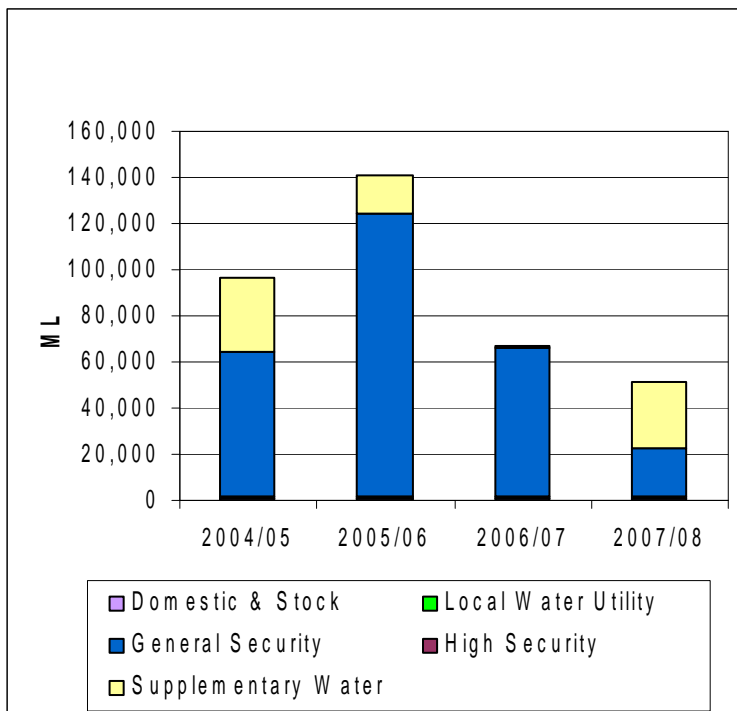
Water for the environment

Managing to extraction limits

The Plan establishes a long-term average annual extraction limit estimated as 238,000 megalitres (ML) per year and identifies water above this limit (approximately 73 per cent of flows) as planned environmental water. This limit is determined by hydrologic modelling – it is not the volume of water extracted from the water source in any particular year.

The Department of Water and Energy updates this model with any available new information and reruns it every year. Although there has been additional irrigation development (ie. on-farm storage) in the Namoi since the drafting of the Plan, actual water use has been low due to the dry conditions (Figure 1) and the Plan limit has not been reached. The Department will continue to monitor the situation and assess the long term annual extraction against the Plan limit.

Figure 1 Upper and Lower Namoi Regulated River water use 2004 to 2008



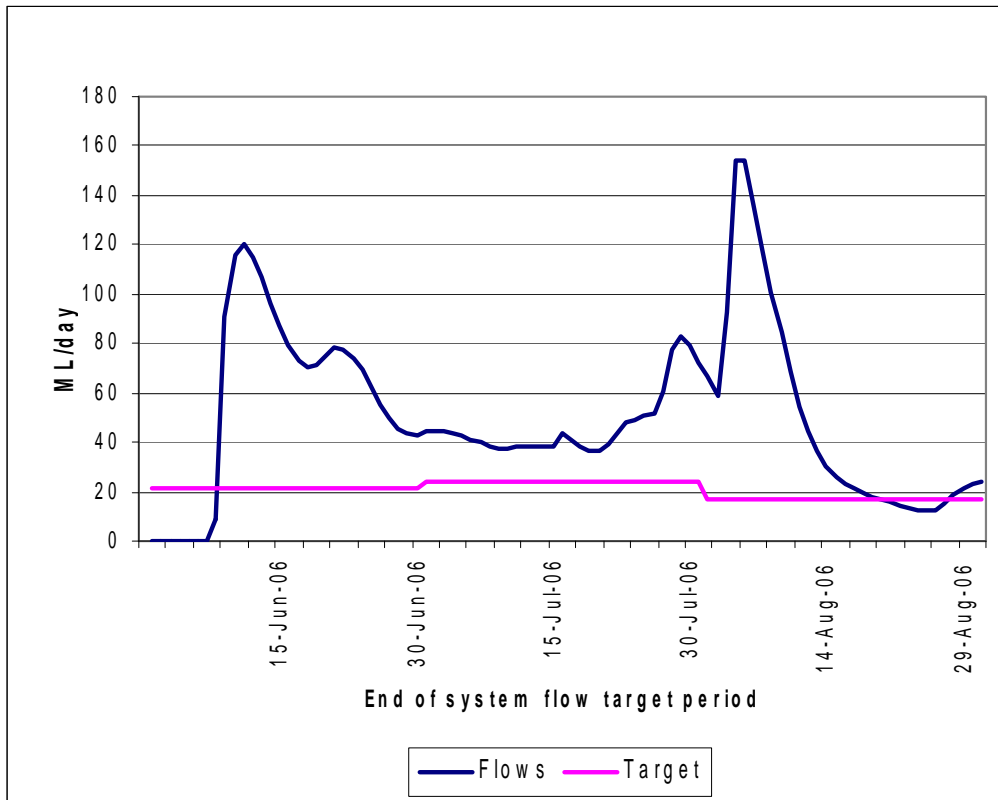
End of system targets

The Plan contains rules for ensuring that minimum flows reach the confluence of the Namoi and Barwon rivers between 1 June and 31 August. The target flows are currently estimated as 21 ML per day in June, 24 ML per day in July and 17 ML per day in August. These rules are aimed at restoring a proportion of natural flows to the end of the regulated Namoi River system.

In the first year of the WSP, no flows were delivered to Walgett (the target location). The decision to delay the implementation of this rule until 2005–06 was made in light of the lead time required for releases to travel from Keepit Dam to Walgett (between 14 and 35 days, depending on the antecedent conditions) and the commencement of the Plan after the start of the three month period that these rules apply. If the Government had required full compliance with the rule, State Water would have had to start implementing the WSP before its commencement date of 1 July 2004.

In 2005 and 2006, the criteria for the flow rules were met and flows were delivered for most of the required three month period. In both these years, although releases were made in mid May, the dry conditions meant that travel times for flows to move through the system were longer than expected and extraction by basic rights holders was higher than usual. As a result, the required flow did not reach Walgett until early to mid June. State Water has modified its operational procedures to allow for greater travel time for future releases. Figure 1 shows flows at Walgett during June, July and August (the period for which the rules apply) in 2006. In 2007, no flows were delivered as the combined storage in Keepit and Split Rock Dam was less than 120,000 ML, the trigger for the end of system flow rules. Nor were flows delivered in June 2008, as the combined storage was below the trigger volume for all but five days of that month.

Figure 2 Flows in the Namoi River at Walgett June to August 2006



Protecting a proportion of medium and high flows

Flow variability, important for river health, is enhanced in the Namoi WSP via rules which limit extraction of medium and high flows when access to uncontrolled flows or by supplementary access licence holders is announced. The proportion of flows for each event which is protected from extraction is:

- 90 per cent of each event between 1 July and 31 October
- 50 per cent of each event between 1 November and 30 June.

In addition to these rules, the Plan sets various nominal flow thresholds that trigger access by supplementary access licence holders during the year. Although these rules are not identified as environmental water provisions in the Plan, they ensure that a significant proportion of natural tributary flows necessary for the health of the river are preserved.

Over the past four years these limits on extraction were complied with. Details of access by supplementary water users are included on page 5 of this report.

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.

As at 30 June 2008, no access licences had been nominated as adaptive environmental water in the Namoi Regulated River Water Sources.

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).

Prior to the commencement of the Plan, the Department converted 457 licences issued for the Namoi Regulated River Water Sources under the *Water Act 1912* to licences and approvals under the *Water Management Act 2000*.

Basic rights

The Plan provides for water to satisfy basic landholder rights. No access licences are issued for these. In the Namoi, water extracted by basic rights holders is insignificant when compared to the Plan's extraction limit. Water to meet these needs is included in State Water's operational protocols as essential requirements and delivered on top of water ordered by licence holders and via a replenishment flow down Pian Creek. These flows are met by a combination of releases from Keepit Dam and tributary flows downstream of the Dam. Since commencement of the Plan, replenishment flows (measured at Dempseys Bridge) have ranged between 1,021 ML in 2007–08 and 14,539 ML in 2005–06.

Dry conditions since the commencement of the Plan, have meant that water for basic rights holders has been curtailed and at times flows have ceased for short periods.

Access licences

Share entitlements for access licences within the Namoi Regulated River Water Source were estimated at the commencement of the Plan.

The only change in licence entitlement recorded in the Department's register over the past four years reflects the correction of an error in the original conversion of the licences to the *Water Management Act 2000*. Total access licence entitlements remain unchanged.

Available Water Determinations

An Available Water Determination (AWD) is the volume of water that is made available to a category of access licence. For all categories of licence, except general security, announcements are made at the commencement of the water year (1 July). Announcements for general security licences are reviewed and updated regularly reflecting changes in the Department's assessment of available water. In December 2007, for example, three AWD announcements were made for general security access licences in the Lower Namoi reflecting the rapid changes in water availability during this month.

Due to extended low flows, AWD announcements for general security access licences in the Lower Namoi was set at zero for a period of 17 months between February 2006 and July 2007. When water was made available for this category of licence, AWD announcements for this category of licence in the Lower Namoi ranged from zero to a maximum of 0.117 ML per share in September 2005. In the Upper Namoi, AWD for general security was set at 1 ML per share, except for in 2007–08 when it

commenced the year at zero and rose to 0.5 ML per share following a rise in the level of Split Rock Dam.

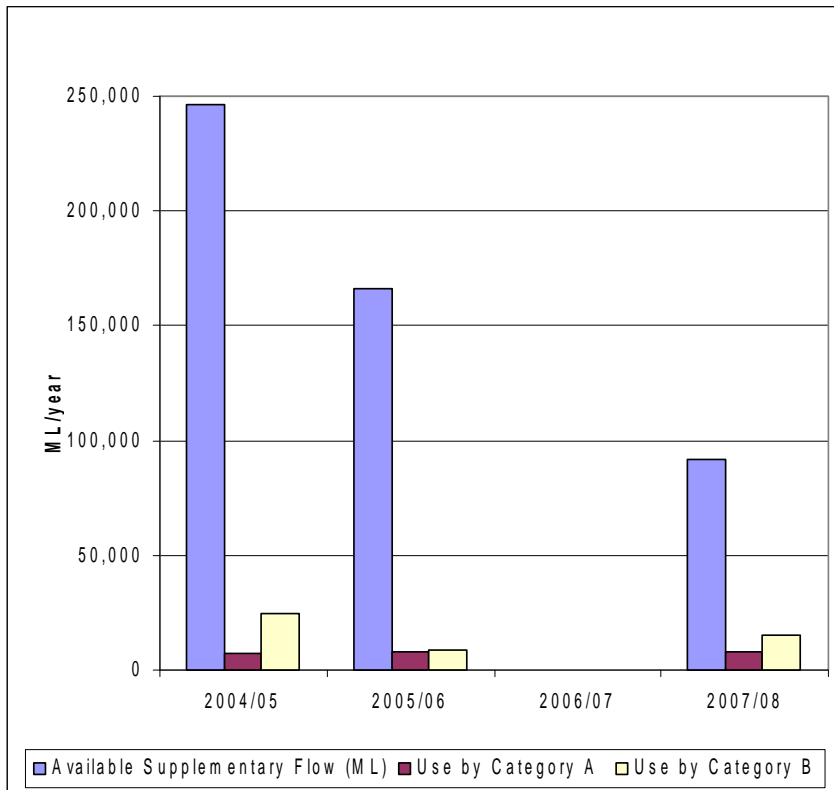
AWD announcements for high security access licences in both the Upper and Lower Namoi were set at 1 ML per share for the period 2004 to 2008. Announcements for all other categories of licences in both the Upper and Lower Namoi has been set at 100 per cent of share entitlement since the commencement of the Plan.

Supplementary water access

The Plan details rules for water extraction under supplementary water access licences in the Lower Namoi water source. Since the commencement of the Plan there have been eight announced periods of access for category A of between one and three days and seven announcements for category B licences. Reflecting the limited availability of water, most of these announcements only allowed access to flows by licence holders in some sections of the Lower Namoi, with users in the bottom section of the Lower Namoi receiving the greatest access. Access to supplementary water in Pian Creek was limited to 2004–05. Total use by supplementary water access licence holders was 32,134 ML in 2004–05, 16,463 in 2005–06 and 23,543 in 2007–08 (see Figure 3). Access to water under Supplementary Access Licences was suspended from July 2006 to December 2007 in order to provide as much water as possible to downstream towns, particularly Broken Hill.

The proportion of flows able to be extracted from each event is limited by the Plan (namely, a maximum of ten per cent of flows is to be extracted between 1 July and 31 October and 50 per cent during the remainder of the year). These limits were complied with in all years that access to supplementary was declared.

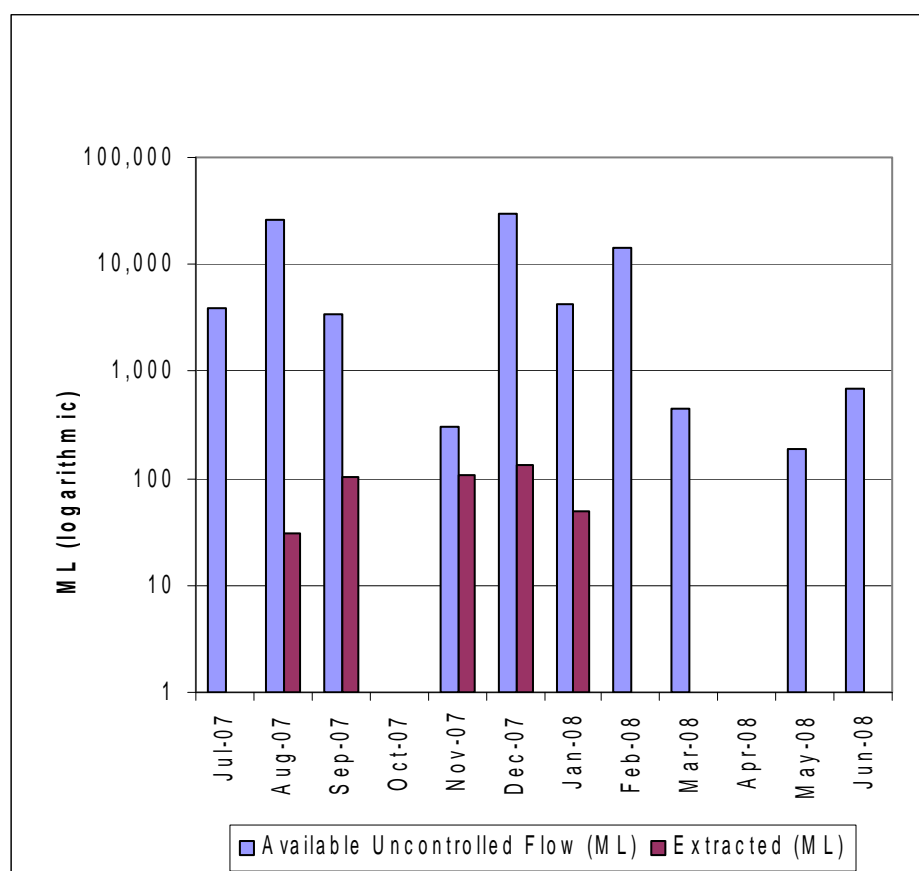
Figure 3 Lower Namoi Regulated River Supplementary Water Access 2004 to 2008



Access to uncontrolled flows

Rules are also set out in the Plan for extracting water from uncontrolled flows in the Upper Namoi. These rules allow the taking of uncontrolled flows without debit to water accounts for general security access licence holders under specified conditions to augment very low general security allocations. This was only available in the first half of 2008 in the lower section of the Upper Namoi. During this period, access was available for 155 days spread across ten separate announcements. Actual volumes extracted, however, were much lower than the total volume which could have been extracted under these announcements and was limited to five of the ten months that announcements were made. Figure 4 shows a comparison of the volumes available and actual extraction from uncontrolled flows.

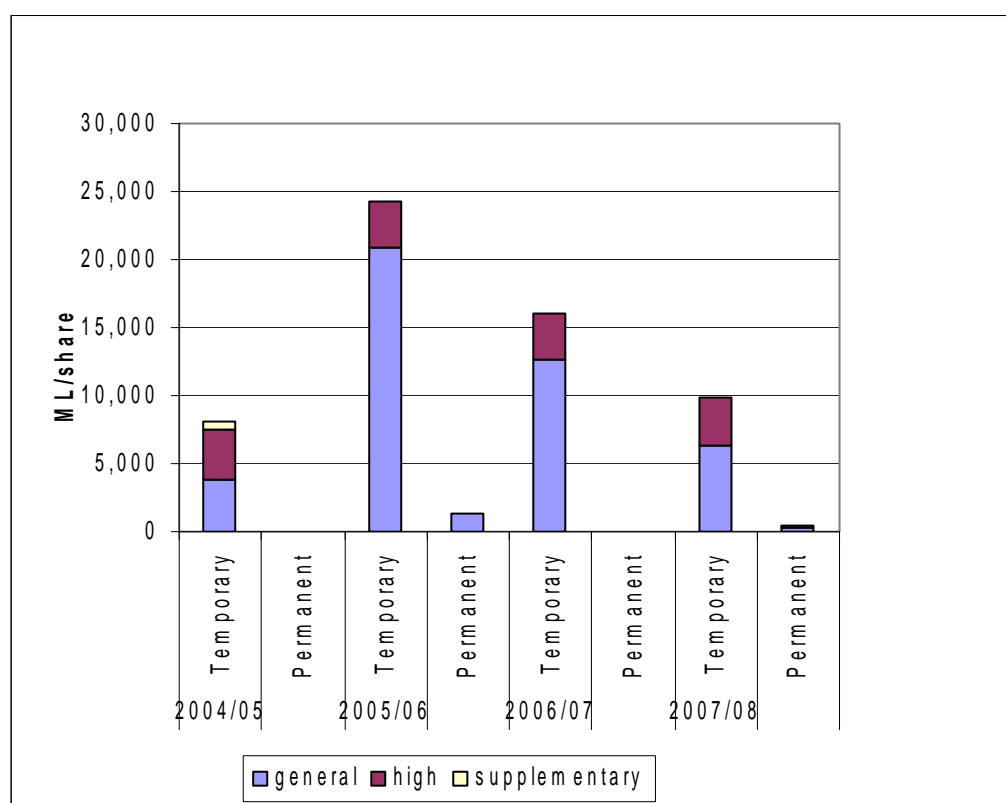
Figure 4 Upper Namoi Regulated River Access to uncontrolled flows 2007 and 2008



Water markets

Temporary transfers of water licences were introduced in NSW in regulated streams in 1983–84 and permanent trades in 1989.

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. Figure 5 shows both temporary and permanent trades since the commencement of the WSP. Variations between those years are mostly related to climatic conditions.

Figure 5 Upper and Lower Namoi Regulated River access licence dealings 2004 to 2008

Water source operation

In 2007, approximately 55,000 ML of water was transferred from Split Rock to Keepit Dam, to satisfy water requirements of downstream irrigators. Monitoring of the impact of this transfer showed that there was a slight drop in the temperature of the river water, which was within normal temperature variations over a 24 hour period. It is likely that this release provided river ecosystem benefits due to the inundation of riverbank benches, improving habitat and food sources for in-stream biota.

Monitoring

The effectiveness of the Namoi plan in achieving its objectives will be assessed by 2014. The Department has developed methods for long term monitoring of plans to support this assessment (see www.dwe.nsw.gov.au for more information on ecological monitoring).

In the Namoi, the ecological monitoring program has focussed on the monitoring of planned and supplementary environmental water flow provisions which influence the ecological response of flows in instream and floodplain wetlands, the transfer of dissolved organic carbon to and from the floodplain, and the relationship between flows and the incidence of blue green algal blooms occurring in the river.

Monitoring of a number of wetlands located between Boggabri and Walgett has been undertaken to establish the linkages between river flows and aquatic vegetation and aquatic macroinvertebrate response. It is expected that with the implementation of the flow rules, replenishment of billabongs and wetland basins will occur more frequently resulting in the creation and maintenance of wetland habitat for a wide range of plant and animal species.

The resulting increase in flow is expected to inundate benches and riparian zones, wetting terrestrial leaf litter. Wetted litter may provide a food source for detritivorous invertebrates such as yabbies (*Cherax destructor*), and increase levels of dissolved organic matter as a result of leaching and microbial action. Microbial activity in the water column, enhanced by elevated dissolved organic matter, may promote zooplankton population increases, which will provide enhanced food sources for small fish (including larvae and juveniles).

An increase in populations of zooplankton can be seen as an environmental benefit both in itself and because of the role of zooplankton in fish diet. Similarly, macroinvertebrate use of flooded litter can be seen as a benefit because it is likely to lead to increases in invertebrate populations.

Macroinvertebrates are important food sources for fish, turtles, some bird species and platypus.

Abundances of key algal taxa, and algal community structure, will be related statistically and numerically to hydrological descriptors of the antecedent water regime at each site. This will provide simple models of the relationships between water regimes and algal build-up and dispersal. Where possible, the influence of confounding factors such as temperature, light and nutrients will be incorporated in these models. The ecological response models will be linked to hydrological models of the river. The linked models will be run with actual flows (scenario 1) and with simulation of the flows that would have occurred without the flow rules (scenario 2). Benefits of the environmental flow rules will be inferred from differences between the model outputs for the two scenarios. If the models predict such benefits, the hypothesis will be confirmed. In the long-term, statistical trends in bloom frequency will be determined.

The review of the WSP's effectiveness will also consider the economic and social elements of the Plan's objectives. To this end, key indicators for monitoring of the irrigation sector have been identified and a survey conducted in 2006 to establish baseline information for ongoing assessment.

Plan amendments

The Plan allows for a number of changes to be made to it. No amendments have been to the Plan since its commencement.