Department of Primary Industries
Water

Intersecting Streams Water Resource Plan

Surface Water (SW13)

Status and Issues Paper

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Intersecting Streams Water Resource Plan (Surface Water SW13), Status and Issues Paper

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More information

www.dpi.nsw.gov.au

Acknowledgments

This project is funded by the Australian Government's Sustainable Rural Water Use and Infrastructure Program, as part of the implementation of the Murray-Darling Basin Plan in NSW.

Foreword

The NSW Government has agreed to develop water resource plans (WRPs) as part of implementing the Murray-Darling Basin Plan 2012 (the Basin Plan). The Intersecting Streams Water Resource Plan (Surface Water) (SW13) covers all surface water in the Yanda Creek catchment and NSW portions of the Mooni River catchment, the Narran River catchment, the Culgoa River catchment, the Warrego River catchment and the Paroo River catchment.

The *NSW Water Resource Plan Roadmap 2016–2019* sets out the key timelines, principles and processes that will guide development of the 22 water resource plans (WRPs) that NSW must deliver by 2019. Weekly progress reports and monthly newsletters will show how the Department is tracking against the project timelines in the Roadmap. Both will be available on the Department of Primary Industries – Water (DPI Water) website at www.water.nsw.gov.au.

Water resource plans will align Basin-wide and state-based water resource management in that particular resource plan area. The plans will recognise and build on the state's' existing water planning and management. They will include documents that set out the interrelated water management arrangements for each water resource plan area.

Before they can commence, final versions of water resource plans must meet Commonwealth accreditation requirements that ensure they are consistent with the Basin Plan.

This *Status and Issues Paper* summarises the status of water resources, and issues that DPI Water will consider when developing the Intersecting Streams WRP. DPI Water will consider additional issues raised during submission and consultation periods during the development process.

As the Intersecting Streams WRP progresses, DPI Water will publish additional technical reports to provide greater detail on many of the matters discussed in this paper.

Have your say

DPI Water invites NSW Intersecting Streams stakeholders, particularly surface water users, to make submissions on issues listed in Section 3 of this *Status and Issues Paper*. Your input will help shape the water resource planning process to ensure that local issues and concerns are addressed.

This first round of submissions will help ensure that all issues are on the table when the NSW Intersecting Streams water resource planning process starts.

Submissions should only raise new issues relating to water sharing and water quality that are not already included in the Status and Issues Paper, in particular:

- water sharing arrangements/rules from the 2011 Intersecting Streams Unregulated Streams and Alluvial WSP
- risks to water quality

Issues raised during the Status and Issues submissions process will be used to develop a full list of issues to be considered/ analysed during the development of the WRP.

All submissions, from brief emails to full technical papers, are welcome and will be fully considered.

If you wish your submission or your personal details to be treated as confidential for any reason then you can request this. You should be aware that DPI Water may be required by law to release copies of submissions received to third parties. A request for access to a confidential submission will be determined in accordance with the *Government Information (Public Access) Act 2009*.

Please be aware that if you **do not** make a request for confidentiality, then DPI Water may make your submission, including any personal details contained in the submission, available to the public, if requested to do so.

Submissions must be received by Friday 23 June 2017 and may be submitted via email or post:

- **email:** intersectingstreams.sw.wrp@dpi.nsw.gov.au
- **post:** PO Box 2213 Dangar NSW 2309

DPI Water will invite a second round of submissions on the draft Intersecting Streams WRP later in the process. That submission period will be advertised in The Land, local papers and on the DPI Water website.

DPI Water will acknowledge all submissions in writing.

Documents and supporting material will be available on the DPI Water website at www.water.nsw.gov.au

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1 Water resource plans

1.1 Principles

Principles set down in the Murray-Darling Basin Plan 2012 (the Basin Plan), together with principles set by NSW Government, will guide the development of water resource plans (WRPs).

Principles guiding the Basin Plan are:

- there will be no adverse impacts on water available to a water access license holder
- there will be no net reduction in the protection of planned environmental water
- the Commonwealth is responsible for bridging the gap between existing limits and Sustainable Diversion Limit (SDL) water
- the WRP must meet the requirements set out in the Basin Plan

Additionally, NSW requires that WRPs:

- balance social, cultural, economic and environmental needs of the community and catchments
- are cost neutral for NSW licence holders
- minimise change for water sharing plans (WSPs) within their initial ten-year period.

1.2 Objectives of the water resource plan

The Basin Plan aims to provide for a healthy working Basin into the future. WRPs are a key part of implementing the Basin Plan. They will address the objectives of the Basin Plan at a regional level.

Objectives include environmental, economic, social and cultural aspects.

For more information regarding the objectives of WRPs, refer to the DPI Water factsheet *Water resource plans – overview*.

1.3 What the final water resource plan will look like

A WRP will be made up of at least one WSP, a water quality management plan (WQMP), a risk assessment and other supporting documents. DPI Water will adjust the WSP, where necessary, to meet the requirements of the Basin Plan and address areas for improvement identified through consultation and technical studies.

NSW WRPs will meet the minimum requirements of the Commonwealth *Water Act 2007* and Basin Plan. Each WRP must:

- describe all water rights in the plan area
- demonstrate how compliance with the SDL prescribed in the Basin Plan will be assessed and maintained
- include a WQMP
- provide for environmental water
- address risks to water resources identified in a risk assessment
- explain how essential human needs will be met in extreme events
- take account of Aboriginal people's water dependent cultural values and uses.

WSPs made under the NSW *Water Management Act 2000* will continue to be the mechanism to articulate water sharing in NSW. WSPs will be a key component of each WRP.

For more information regarding what WRPs will look like, see the DPI Water factsheet *Water resource plans – developing a water resource plan*.

1.4 How water resource plans work with other water plans and projects?

At the same time as DPI Water is developing the WRP, there are other important initiatives occurring in parallel. These include: the development of Long-Term Watering Plans (LTWPs), SDL adjustments, the Northern Basin Review, the Healthy Floodplains Project, NSW Prerequisite Policy Measures, NSW Planning Assumptions for surface water resources, NSW Management of Extreme Events, a review of Trading Rules and the development of Regional Strategies.

For more information regarding these initiatives and how they relate to WRPs, see the DPI Water factsheet *Water resource plans – overview*.

1.5 The water resource plan development process

DPI Water is developing the WRP according to a robust process that follows the National Water Initiative Policy Guidelines and includes community engagement.

This Status and Issues phase of planning will be followed by a Strategy and Rule Development phase. A draft Intersecting Streams WRP (surface water) will be placed on public exhibition. A final Intersecting Streams WRP (surface water) will then be submitted for approval by NSW Minister for Regional Water and the NSW Minister for the Environment, and finally for accreditation by the Commonwealth Minister for Agriculture and Water Resources.

For more information regarding the development process, refer to the DPI Water factsheet *Water resource plans – developing a water resource plan* and the *NSW Water Resource Plan Roadmap 2016–2019.*

1.6 Consultation and stakeholder input

DPI Water will consult in accordance with the National Water Initiative Policy Guidelines and the MDBA's *Handbook for Practitioners – Water resource plan requirements.*

There will be a number of opportunities for stakeholders through public submissions and targeted consultation. Consultation will provide stakeholders with information and a chance to provide informed input on issues and options to improve water resource management.

DPI Water will:

- seek public submissions on issues to be considered
- provide stakeholders with information to help them participate in the planning process
- undertake targeted consultation with stakeholders before drafting the WRP
- seek public submissions on the draft WRP
- undertake further targeted consultation on the draft WRP after public exhibition, if required
- support Aboriginal communities via the DPI Water Aboriginal Water Initiative (AWI) Program to make submissions on the draft WRP and through ongoing community consultation, as required, after public exhibition.

2 Status of the Intersecting Streams surface water resources

This section provides a brief overview of the status of the Intersecting Streams surface water resources.

For more detailed information about the Intersecting Streams surface water resources, please refer to the *Intersecting Streams water resource description report* which will be made available on the DPI Water website.

2.1 The Intersecting Streams surface water resource plan area

The Intersecting Streams WRP (Surface Water) (SW13) will cover all the surface water resources of the Intersecting Streams (Figure 1). It will include the water captured through farm dams, unregulated rivers, and unregulated effluent creeks flowing out of the Barwon-Darling. There are no regulated rivers in this Water Resource Plan Area (WRPA). Groundwater in the area is not included, and will be covered by the Darling Alluvium WRP (GW7) (the *Status and Issues Paper* is due for release 12 May 2017).

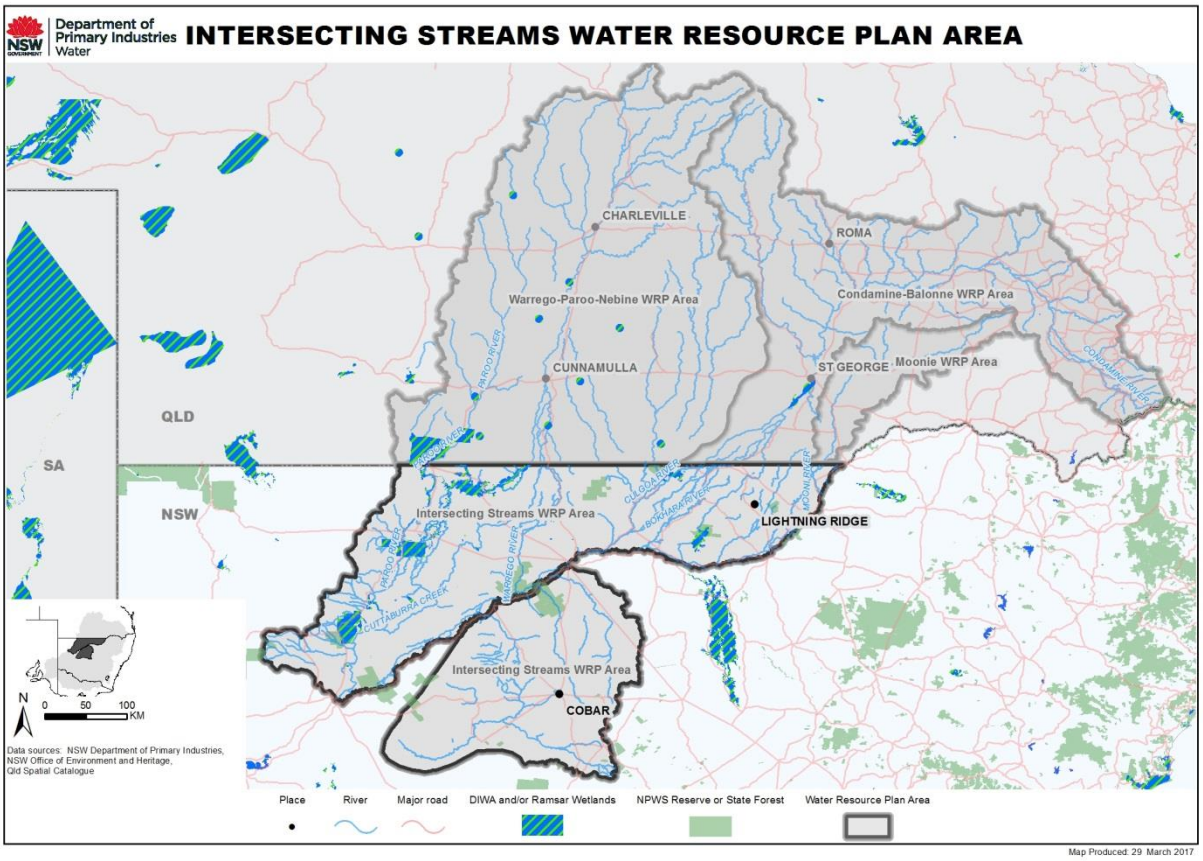

Figure 1: Intersecting Streams Water Resource Plan area

The Intersecting Streams WRPA is located near Bourke, in the far north western corner of NSW. It occupies an area of approximately 120,431 km^2 (NOW 2011). The Plan area comprises six surface water catchments which includes the entire Yanda Creek catchment as well as five water sources which originate in Queensland and terminate in NSW; Paroo River Warrego River, Culgoa River, Narran River and the Moonie River. The Intersecting Streams water sources are characterised by hot dry summers (> 40 °C) and mild dry winters, typical of a semi-arid climate. Rainfall throughout the catchment ranges from 213 mm in the west to 500 mm in the eastern and southern areas. Summer rainfalls are slightly higher, however monthly averages are generally within 10 mm of each other (NOW 2011). Climate change is predicted to increase

temperatures and reduce rainfall resulting in lower surface water availability in the future (CSIRO 2007 a, b & c).

There are approximately 2,973 people in the Bourke Local Government Area (LGA) which is the largest urban centre in the Intersecting Streams (ABS 2011). The 2011 ABS Census estimated the proportion of Aboriginal and Torres Strait Islander peoples was 30.2 % compared to the 2 % for the total NSW population (AHRC 2006). There is a range of industry employment options within the area, with 19.1 % of employed people working within the Agriculture, forestry and fishing sector. The smaller towns within the Intersecting Streams are all serviced by Bourke or other major rural centres outside of the Intersecting Streams WRPA.

The dominant land use in the Intersecting Streams is livestock grazing which covers approximately 65 % of the valley. Very little dryland cropping and irrigated agriculture occurs within the region. Large pastoral stations occupy all of the leasehold land within the WRPA with the exception of scattered localities, national parks and reserves.

2.2 Beneficial uses of the water resources

Aboriginal values and uses

Aboriginal Traditional Owner groups within the Intersecting Streams WRP area include Budjiti, Euahlayi, Guwamu/Kooma, Kamilaroi, Kunja, Murrawarri, and Ngemba. Consultation has not yet been undertaken with these groups with regards to the Intersecting Streams WRP however, as identified in Section 1.6, there will be a number of opportunities for these groups to provide feedback on specific Intersecting Streams issues.

Engagement with Aboriginal communities across the Basin Plan area has provided an understanding that, at a landscape level, Aboriginal people's objectives and outcomes for the management of the water resources are founded in traditional owner group's obligations to the whole river system and associated river communities as an indivisible group. Aboriginal communities have a multi-faceted relationship with access to and use of water. This relationship ranges from a spiritual and cultural association, to an economic focus, to the location of special places.

Through the development of the Intersecting Streams WRP, DPI Water will provide opportunities for Aboriginal people's involvement in the process through the collection of social, spiritual and cultural data, including the identification of specific values and uses. Additional opportunities will be provided for Aboriginal communities and groups to provide submissions to DPI Water to inform the development of the Intersecting Streams WRP.

Historically the inclusion of issues and information relating to cultural values and uses of water by Aboriginal communities had proven difficult for DPI Water due to a lack of data and an inability to adequately address cultural water requirements. It has been highlighted through the AWI community engagement that this lack of cultural data has been one of the major risks to the long-term sustainability of cultural values, with significant consequences and threats to Aboriginal cultural heritage values and uses. These risks and associated management approaches are included in the DPI Water Risk Assessment Report.

Aboriginal knowledge of the environment can contribute to water management plans. The WRP process will continue to identify opportunities to better address the needs and aspirations of the Aboriginal Traditional Owner groups and communities in terms of equitable access to water for social, cultural, spiritual and economic use of water, including the views of Aboriginal peoples with regard to cultural flows.

A number of water-dependent asset types exist across the Basin Plan area landscape.

Table 1 provides a description of some of these asset types.

Table 1: Water-dependent Aboriginal cultural asset types and their values and uses

Water-dependent asset type	Description
Waterholes/soaks/billabongs	Specific waterholes provide refuge for iconic species for Aboriginal people. Waterholes have a customary value and traditional use and often represent a connection between groundwater and surface water. Other uses include gathering resources that have an economic value for Aboriginal peoples.
Wetlands	Wetlands have traditional and customary uses as well as spiritual values. The existence of many scarred trees and a range of traditional resources – vegetation, bird and fish, indicate of Aboriginal occupation and use. After flood the wetlands were often associated with customary/ceremonial use and had a cultural economic outcome through trade. These areas are used now for cultural renewal practices.
Lagoons/ Wetland bowls	A number of flood-dependent lagoons and wetland areas are sites of annual traditional resource-gathering and use. The areas have traditional connection and spiritual connection and are also used now for cultural renewal practices.
Transit stops – ephemeral flows	These areas were subject to natural flows to maintain water levels and water quality. Depending on time of year, fish and other water-dependent resources may be present in the deeper water holes. These deeper holes traditionally provided a refuge to iconic species. The use of these areas has traditional and historic value, as well as contemporary knowledge-sharing. The areas also supported tool creation and occupation for periods of time as evidenced through grinding grooves and provided transit stop opportunities in times of flow and resource abundance. Specific location and times for use of these types of areas are part of the traditional songlines for the Traditional Owners and are an integral part of Aboriginal culture.
Occupation sites and camp grounds	There are many occupation sites exist across the catchment landscape and waterscapes that have a directly rely on water. These sites are evidenced by hearth sites, tool-making sites, grinding grooves and resource gathering sites. A number of these particular sites and camp grounds include the traditional use of water for childbirth and continue to be significant to Aboriginal women.
Spiritual sites,areas	There is a great deal of spiritual connection to water across the landscape of the Murray-Darling Basin. This connection is present in many Dreaming and creation stories, artwork and cultural practices including dance and song. The detail of these relationships is mostly remains guarded by Lore with Aboriginal people, however the connection to water is prevalent and evidenced in the cultural practices of the Aboriginal communities across the basin states.

Irrigated agriculture

Within the Intersecting Streams WRPA, grazing is the main land use activity (ABARES 2016). Water extraction in the Intersecting Streams is utilised for a range of uses which include: irrigation, stock, domestic, mining, town water supply, industrial, and recreational purposes. The sandy substrate characteristic of the Intersecting Streams negates most attempts at broad scale crops and pastures, although cotton farming is still a relatively successful enterprise in the eastern water sources, and grazing occurs throughout all the plan area (NOW 2011). The main contributor to the region's economy is grazing of beef cattle and sheep for wool production (MDBA 2016 a, b).

Detailed water use is not available in the unregulated rivers because there is not yet broad scale metering in these water sources. NSW is exploring this issue through the Water Use Monitoring Program.

Water for towns and essential human needs

Towns and riparian landholders depend on access to water for essential human needs and to support local commerce.

Towns have a higher priority access to water than general irrigation licences. WSPs recognise this priority by ensuring that a full share of water is allocated for annual town water supplies, except when exceptional drought conditions prevent this.

Town water supply licences in the Intersecting Streams have a total share component of 312 megalitres (ML)/year.

The *Water Management Act 2000* also requires WSPs to protect water for basic landholder rights, which are made up of domestic and stock rights, harvestable rights and native title rights. Water taken under a domestic and stock right may be used for normal household purposes around the house and garden and/or for stock drinking water.

In the Intersecting Streams unregulated rivers, requirements for basic landholder rights for domestic and stock rights are estimated to be 2,458 ML/year. Additionally, share components of domestic and stock access licences total 197 ML/year.

Recreational water uses

The rivers of the Intersecting Streams are unregulated, with no major public water storages in the catchment. Tourism in the region is dependent on wetlands, floodplains and national parks, as well as opal mining around White Cliffs (MDBA 2016 a, b).

2.3 Key environmental assets and ecosystem functions

The Intersecting Streams water resources support significant aquatic ecological values (Figure 2) including:

- Significant Ramsar and Directory of Important Wetlands in Australia (DIWA) listed wetlands. Ramsar sites are located in the Paroo and Narran River water sources;
    - Nocoleche Nature Reserve (71,000 ha)
    - Paroo-Darling National Park (61,171 ha)
    - Narran Lake Nature Reserve (8,447 ha)
- Habitat for threatened and endangered bird species including the Australasian Bittern (*Botaurus poiciloptilus*), Australian Painted Snipe (*Rostratula australis*), Black-necked Stork (*Ephippiorhynchus asiaticus*), Black-tailed Godwit (*Limosa limosa*), Brolga (*Grus rubicunda*), Blue-billed Duck (*Oxyura australis*), Freckled Duck (*Stictonetta naevosa*) and the Curlew Sandpiper (*Calidris ferruginea*).
- Threatened plant species including: Shrub Sida (*Sida rohlenae*), Winged Peppercress (*Lepidium monoplocoides*) and the endangered aquatic plants *Aponogeton queenslandicus*, *Nocoleche goodenia* and *Nitella partita*.
- Native fish species including Murray Cod (*Maccullochella peelii peelii*), Bony Bream (*Nematolosa erebi*), Golden Perch (*Macquaria ambigua*) and Silver Perch (*Bidyanus bidyanus*).
- Supports a number of endangered ecological communities (EEC) including:
    - The critically endangered Artesian Springs Ecological Community;
    - Coolibah-Black Box Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain and Mulga Lands Bioregion; and
    - Lowland Darling River EEC.

The two Paroo River wetlands listed under the Ramsar Convention are unique examples of near natural, arid inland wetland systems. The natural pattern of flow is maintained as there are no major diversions, dams or weirs. They provide a significant refuge for biological diversity including newly identified plants and macroinvertebrates and a separate breeding population of golden perch (*Macquaria ambigua*) (Keenan et al. 1998). The Narran Lake Nature Reserve is one of the most important areas for birds in NSW, ranked among the highest for species richness, number of breeding species and total abundance (MDBA 2012).

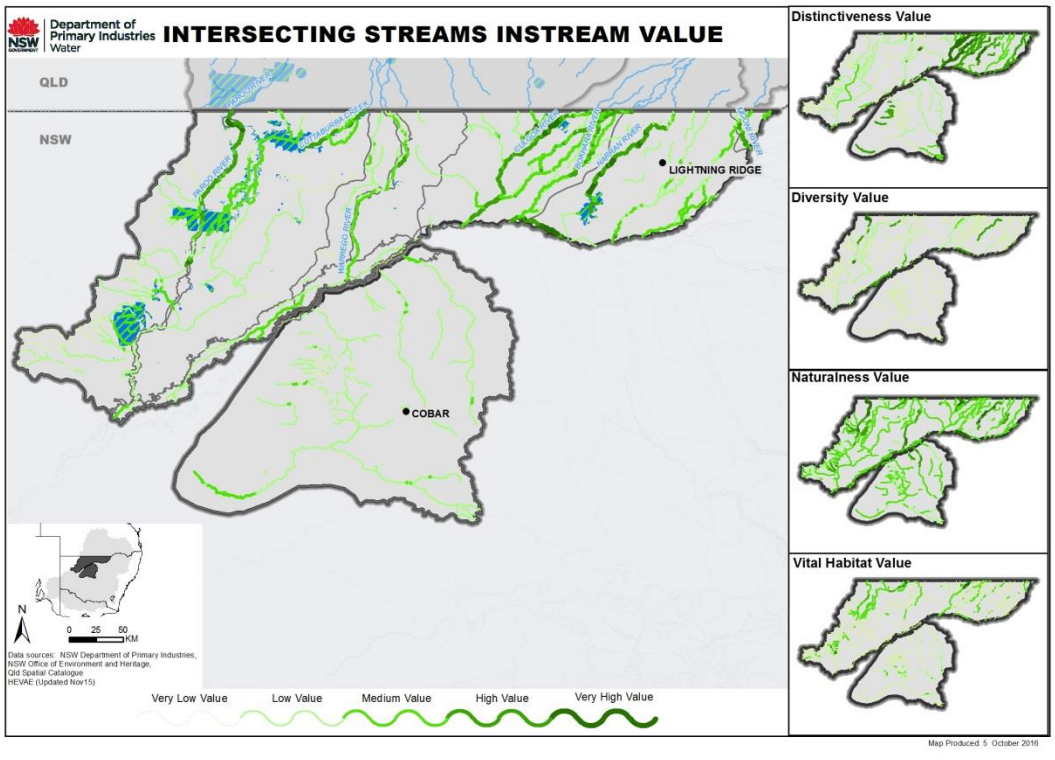

Figure 2: Map of HEVAE assessment outcomes for the Intersecting Streams WRPA

2.4 Stream flows

The river systems within the Intersecting Streams WRPA are particularly unique, with some of the largest natural free flowing systems in the Murray-Darling Basin. All rivers within the Intersecting Streams are categorised as unregulated systems, although some water capture does occur in Queensland storages (eg E.J. Beardmore Dam). Variability in stream flows occurs between seasons and across the catchments with sporadic flooding associated with cyclonic rain depressions in the Queensland portions of the water sources (NOW 2011). The wetter months and subsequent higher flows occur in summer-autumn with the drier periods during late winter-spring. The wetlands of the Paroo, Warrego, Narran and other rivers in the Intersecting Streams water source are primarily towards the end of each system.

The Condamine-Culgoa Rivers which includes the Narran and Bokhara River contributes 20 % of flow to the long term average flow in the Darling River at Menindee. Water resource development in Queensland has resulted in changes to water regimes of the Intersecting Streams. Since 1993-1994, the mean annual volume of water diverted from the unregulated section of the Condamine-Culgoa catchment (downstream of St George) has increased by 339 %. Figure 3 shows the period of record available for the Culgoa River and Narran River, both derived from the Condamine-Culgoa Rivers. Both these systems have experience the greatest degree of flow alteration with the average cross border flows into NSW halving since 1993 compared to natural conditions (SMEC 2006).

As there is no accurate water take records for unregulated water access licences, it is difficult to estimate actual volumes used from year to year.

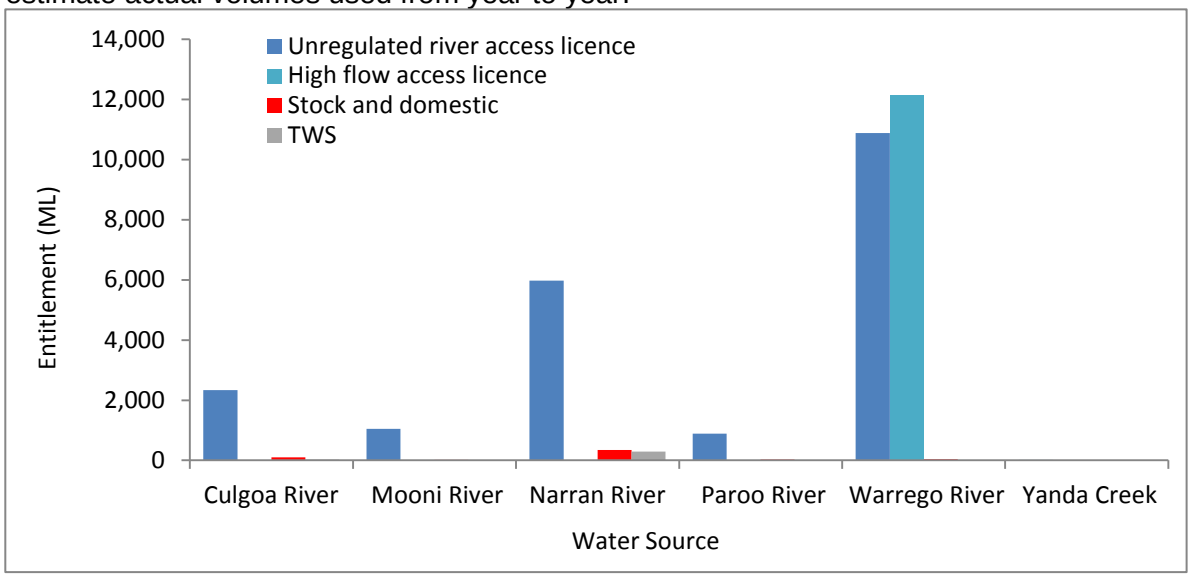

Figure 4 shows the spread of water entitlements for each water source as of June 2016.

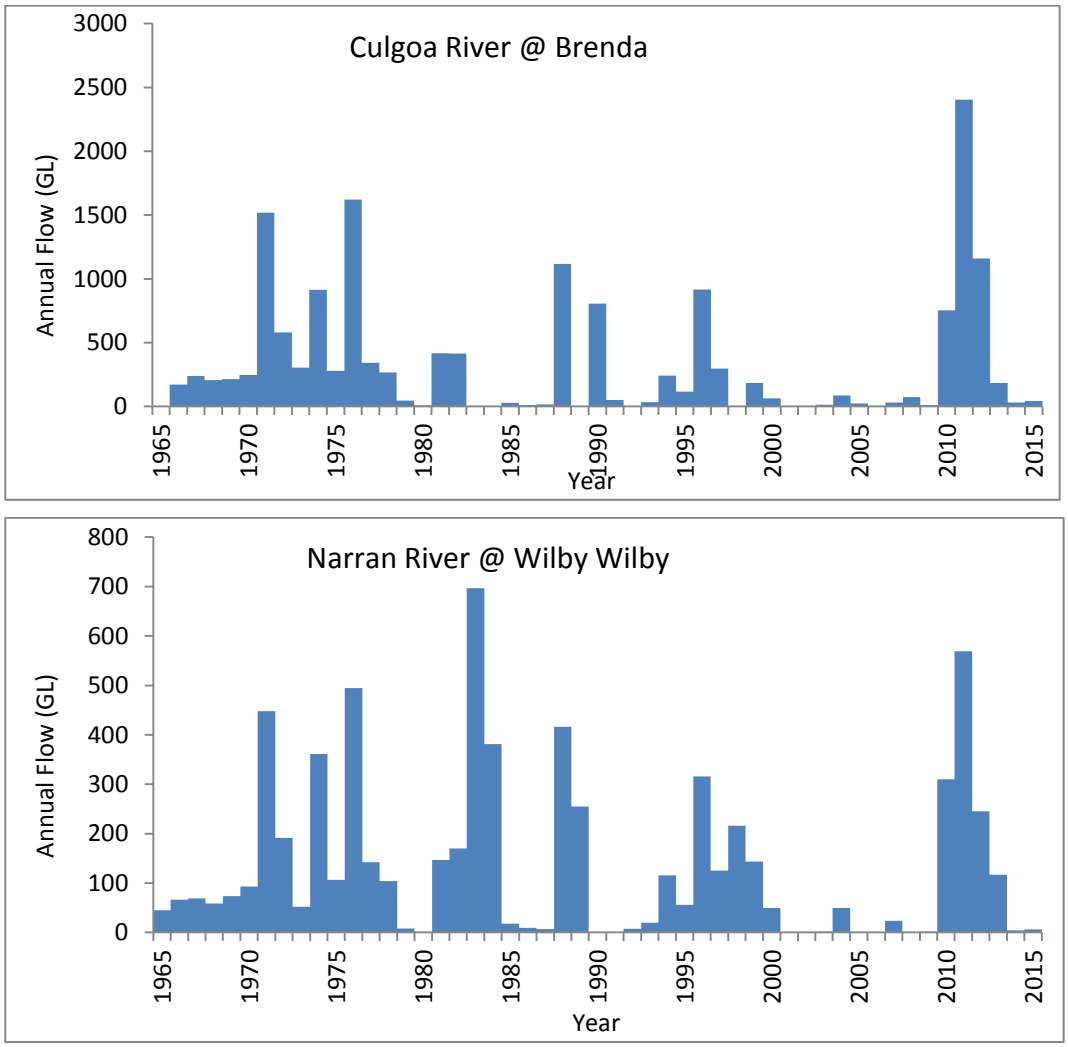

Figure 3: Annual flows in the Culgoa (422015 Culgoa River @ Brenda) and Narran Rivers (422016) Narran River @ Wilby Wilby

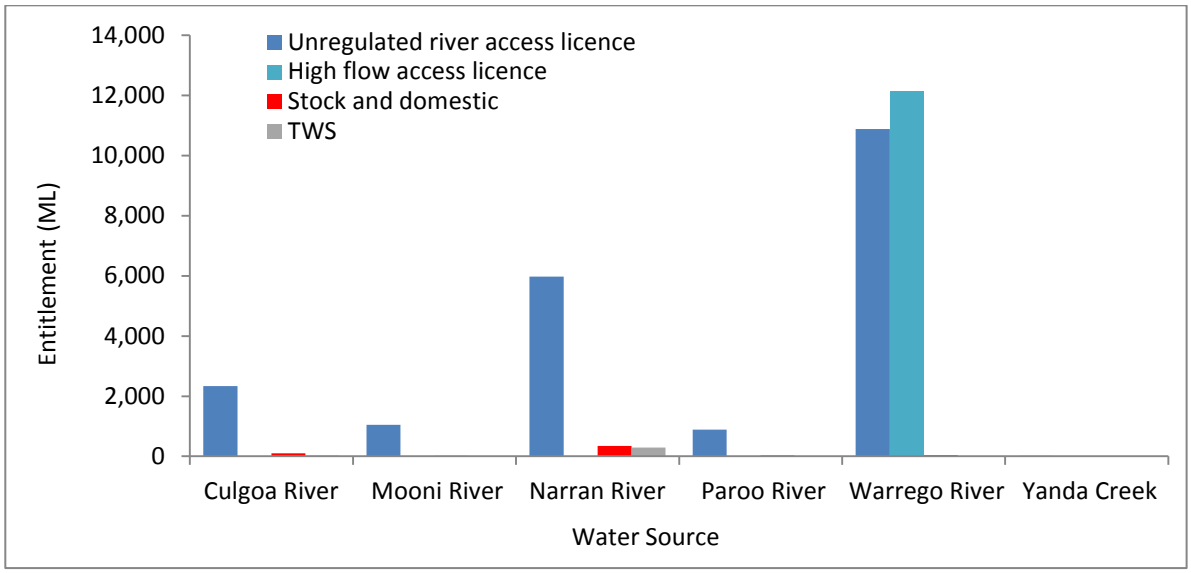

Figure 4: 2016 water entitlement type for unregulated water access licences in the Intersecting Steams

2.5 Water Quality

The condition of water quality in the Intersecting Streams WRPA varies from fair to good. Degraded water quality can put stress on a range of aquatic organisms, impact on Aboriginal cultural and spiritual uses of water, increase the cost of drinking water treatment, contribute to public health risks and decrease the suitability of water for irrigation.

The following water quality parameters were considered: dissolved oxygen (DO), pH, salinity, nutrients, sediments and turbidity, algae, temperature, organic carbon and toxicants.

The water quality status map (Figure 5) provides an overview of water quality condition within the Intersecting Streams WRPA. It shows and assesses monitoring locations in the plan area using a water quality condition index (WaQI). The WaQI is a combined index for nutrients, pH, turbidity and dissolved oxygen. It scores water quality data collected by NSW government against targets listed in the Basin Plan. Harmful algal blooms and salinity for irrigation water are also assessed and described in Table 2. There are no water quality monitoring sites in the Yanda Creek area. For this reason, the water quality assessment in Table 2 is listed as unknown.

Changes to land use and natural river flows are the main causes of water quality problems within the catchment. Section 3.7 provides a summary of the status of water quality in the different regions of the plan area. The future water quality management plan will describe the water quality issues in the Intersecting Streams WRPA including possible management strategies.

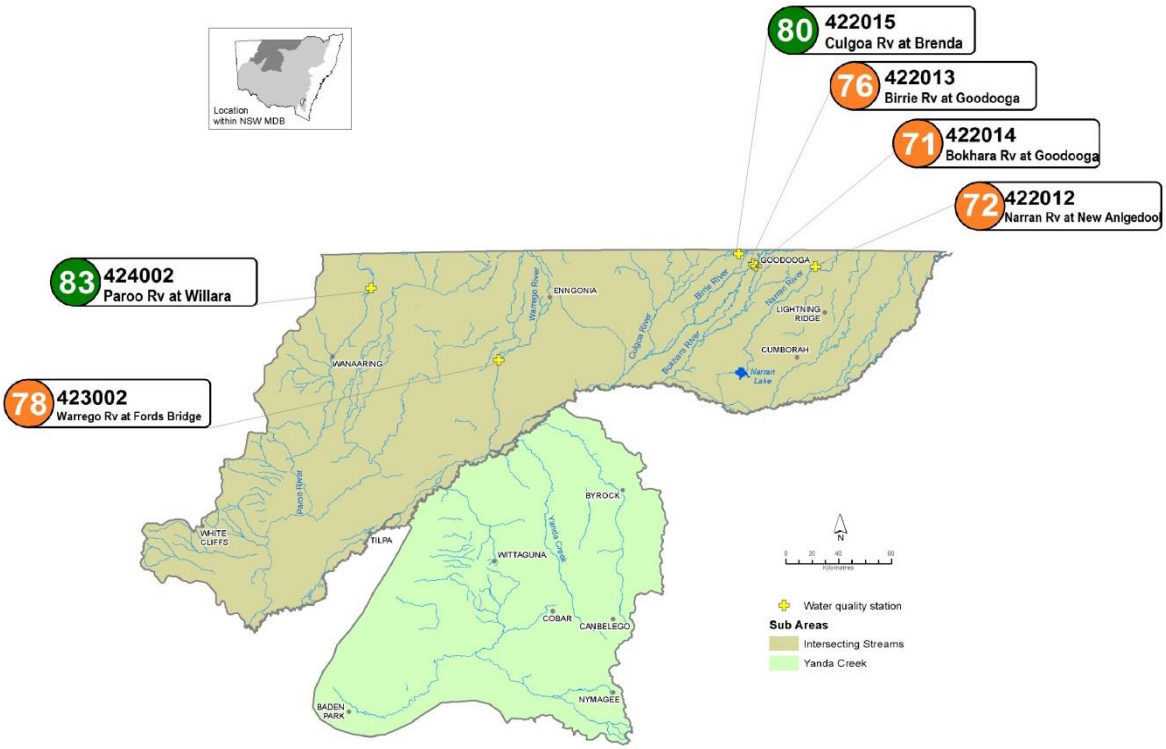

Figure 5: Water quality condition of the Intersecting Streams WRPA. WaQI Scores: Blue = Excellent (100-95), Green = Good (94-80), Orange = Fair (79-60), Red = Poor (59-1)

Table 2: Summary of water quality assessment in the Intersecting Streams WRPA

	Yanda Creek	Intersecting Streams
Dissolved oxygen	Unknown	Unpredictable during low flows. Can be elevated due to algal growth.
pH	Unknown	Frequently above the upper pH target limit. May be elevated by algal growth.
Salinity	Unknown	Generally low.
Nutrients (nitrogen and phosphorus)	Unknown	High throughout the zone due to nutrient inputs from upper catchments. Increased during high flows.
Suspended sediments and turbidity	Unknown	High throughout the zone due to inputs from upper catchments and fine clay particles remaining in suspension. Increased during high flows.
	Turbidity is elevated due to a number of factors including the widespread conversion of land for cropping, river bank and riparian condition, presence of carp and grazing practices. Fine clay particles remaining in suspension in the water column, even during low flows, maintains elevated turbidity levels.	
Harmful algal blooms	Unknown	Algal blooms can occur anywhere in this zone during warmer months. More commonly found in weir pools, such as Narran River at New Angledool and Bokhara River at Goodooga. Caused by low flows, clear, warm water and high level of nutrients.
Thermal pollution	Nil	Nil

3 Issues to be addressed in water resource plan development

3.1 How issues were identified

This section of the paper describes the water sharing issues that have been identified and which will be considered when developing the WRP. The Basin Plan requires WRPs:

1. comply with the SDL
2. identify opportunities to strengthen protection of Aboriginal values and uses
3. provide for environmental watering
4. manage medium to high risks identified in a risk assessment
5. identify measures to contribute to water quality objectives
6. specify how critical human water needs will be met in extreme events

DPI Water has maintained an ongoing relationship with stakeholders in the Intersecting Streams WRPA. DPI Water is also consulting with the Aboriginal community regarding water-dependent cultural values, uses and issues.

In addition to this, DPI Water has identified issues through the following technical assessments:

- a risk assessment for the Intersecting Streams surface water resources; several medium to high risks were identified that need to be considered in developing the WRP
- an assessment of the status and causes of water quality degradation

Reports on these technical assessments will be made available separately.

3.2 Supporting Aboriginal values and uses

The AWI has engaged with Traditional Owners and the broader Aboriginal community across several WRPAs and have captured a range of issues identified through this process. Some similarity across WRP areas has been observed at a landscape level - however, each WRPA will likely be characterised by specific issues relevant to the WRP. DPI Water has done some initial consultation with Traditional Owners within the Intersecting Streams WRPA. This work will be ongoing and further opportunities to inform development of the water resource plan will be provided at the time of public exhibition and targeted consultation.

WSPs currently provide various forms of protection and benefit for Aboriginal peoples' values and uses, including specific-purpose Aboriginal cultural access licences. However, additional consideration around providing water for Aboriginal peoples' economic purposes and cultural flows is required as part of the WRP development process. The issues that can most likely be dealt with during the WRP development process are listed below, with additional issues listed in Appendix 2.

Issues identified by Aboriginal communities across the Basin

Issue	Status
Instream works are impacting on the general and natural flow of water within a system.	Potential for WRP risk assessment to consider.
Water quality is an issue in low flow times and generates significant weed growth. This hampers fishing and cultural renewal activities that use the water source.	Potential for WRP risk assessment to consider.
Availability of access to water for cultural practice and renewal activities is an issue	Provision for specific-purpose licence however no 'cultural flows'. Potential for

that impacts the Aboriginal community's ability to plan and carry out cultural renewal events. There is a reliance on natural flows. However, planning around these events is problematic.	WRP risk assessment to consider.

3.3 Improving water sharing

DPI Water will develop plan rules using the best available information and will engage with stakeholders to ensure that water sharing rules are improved and unintended consequences are minimised. The issues below were raised by stakeholders in relation to the WSPs.

Improving plan objectives and performance indicators

DPI Water Plan review identified that improvements to objectives and performance indicators are required. The WSP will be part of the WRP, so its objectives must be consistent with those of the WRP. The WRP must address environmental and water quality objectives set out in the Basin Plan and identify the objectives of Aboriginal people.

Issue	Status
The current objectives and performance indicators in the WSPs should be reviewed as they are not fit for purpose. They do not adequately accommodate the local community, industry, economy or Aboriginal objectives; are not consistent and not well aligned to the plan rules or other natural resource plans.	DPI Water is developing improved plan objectives and performance indicators. Appendix 1 includes a draft set of objectives for the Intersecting Streams WRP. Once finalised, they will replace those in the current WSP.

Interstate transfer of access licences and assignment of water allocation

The Basin Plan allows for trade of surface water between states in an unregulated system, when the boundary between the unregulated systems is based solely on the border between the two Basin States. Currently, the WSP does not allow the interstate transfer of access licences and assignment of water allocation. The WSP does include an amendment provision which allows interstate trading to occur, as a result of an interstate agreement. A framework to allow for interstate trade, as well as administration arrangements between the states will be progressed further only if requested by water users.

Issue	Status
A framework needs to be established which allows for interstate unregulated trade with QLD.	This issue will only be progressed in water resource planning if NSW water users are interested in interstate trade.

Reviewing mandatory conditions on licences and approvals

The WSP includes mandatory conditions that are imposed on water access licences and approvals.

Issue	Status
Review mandatory conditions relating to logbooks and metering requirements as they are impractical to implement.	To be considered by DPI Water initially at a state-wide level.

3.4 Complying with the Sustainable Diversion Limit

The Basin Plan sets a single SDL for all the surface water in the Intersecting Streams WRPA. The SDL is a long-term average diversion of water that allows changes from year to year, so long as the long-term average is not exceeded. It is divided into a baseline diversion limit (BDL) which equates to the long-term average amount of water that would have been taken during the historical climate condition (1/07/1895 – 30/06/2009) under State water management law as at 30 June 2009, and a 'reduction' to achieve a sustainable level of take. The Commonwealth is responsible for achieving the reduction through investment involving willing participants. Hence, complying with the SDL can be achieved without impacting on the reliability of water allocations for licence holders under the rules in the current WSPs.

Rather than being a simple number, the SDL is the amount of water that could be taken under the water rights, rules and level of development pre-Basin Plan, minus environmental water recovery. Under the Basin Plan, NSW is required to determine annual permitted take for all forms of take in the Intersecting Streams WRPA. This volume is to be determined each year using models or other methods. Hence it can, where appropriate, vary from year to year depending on climate and water availability. This is a similar approach to that which has been used for Murray-Darling Basin Cap management, but different to the NSW long-term extraction limit compliance methodology as specified in existing WSPs.

Issue	Status
Under the Basin Plan, compliance with the SDL is determined each year by summing a running balance of 'unders' and 'overs' from previous years. If the balance exceeds 20% of the SDL this may be a breach. WSPs have different arrangements for assessing compliance with extraction limits, which may not synchronise with the Basin Plan. The Basin Plan also provides for States to put forward reasonable excuses for SDL non-compliance. Long-Term Diversion Limit Equivalent (LTDLE) factors need to be established for each licence category in order to determine what percentage of each megalitre of water recovered for the environment contributes to bridging the gap between existing limits and the SDL.	These two issues will be addressed as part of the development of a NSW approach to addressing planning assumptions for surface water resources.

3.5 Environmental watering

Since 2009, the NSW and Commonwealth governments have invested to obtain water access licences that can be used for environmental watering ('held environmental water'). The LTWP currently being prepared by NSW Office of Environment and Heritage (OEH) will guide management of both planned and held environmental water in future.

The Basin Plan requires the WRP to provide for environmental watering to occur consistent with the LTWP. However, the way the environmental water is used, and any changes to management to facilitate its use, can affect water availability for other water users. For example, it could result in changes to water conveyance losses that impact on water available to licence holders.

Issue	Status
Changes to the way environmental water will be managed and used can affect water	A state-wide approach, documented in the NSW Prerequisite Policy Measures

availability for licence holders. How environmental water can be used is constrained by the current legislative and policy framework in NSW.	Implementation Plan, is in the process of being finalised. This implementation plan will provide direction for any policy and legislative changes that NSW will make to improve environmental watering.

3.6 Managing risks

DPI Water has prepared a risk assessment, as required by the Basin Plan. The WRP must describe strategies to address medium to high risks where this can be done. These strategies will be appropriate for the nature of the risk and the confidence in the information used to assess the risks. Water availability risks are described in this subsection. Risks relating to water quality are included in Section 3.7 'Improving water quality'.

Risk of insufficient water for the environment

This assessment considers the risk to ecological values arising from the take of water only as there is no regulation of water within the Intersecting Streams WRPA.

For the unregulated rivers in the Intersecting Streams WRPA, there is significant uncertainty in the information used for this assessment. DPI Water has made assumptions about the use of water by licence holders because of the current lack of actual water take information on these rivers. It is likely that actual water take is less than the assumed amount/volume.

Issue	Status
There are possible medium to high risks to ecological values on a number of unregulated river water sources arising from the take of water. More information on water usage in unregulated water sources is needed to confirm whether this is the case.	Trade and cease to pump rules prevent risks being made worse by limiting trade into these areas and unsustainable water take. The current unregulated river water sharing plan is due for review in 2022. During this period, relationships between water flow and aquatic biota will be assessed in several plan areas and a review of the adequacy of current access rules will be undertaken. Better information on unregulated water source water usage will be available by that time.

Risks to water availability caused by increase in number of farm dams

There is some capacity for increases in farm dams in the WRPA through the exercise of harvestable rights. The risk assessment considers the best available estimate of likely growth rate in farm dams, and estimates the likely impact of this on water availability for ecological values and water for consumptive use.

The assessment shows there is no significant risk at the valley scale, but a medium risk to ecological values at a local scale in the Culgoa River and Narran River. There is significant uncertainty in the information used for this assessment. While the assumed growth rate for farm dams is likely to be a reasonable estimate at a large scale, it may not be so at a local scale.

Issue	Status
There are possible medium risks to ecological values in three areas arising from future growth in farm dams.	Subject to funding, DPI Water will monitor to determine if increases in farm dams occur in these areas and whether this changes the risk of farm dams to ecological values within

	this WRPA.

Risks to water availability arising from climate change

The risk assessment considers risks associated with changes to water availability under dry, median, and wet climate change scenarios. The assessment considers impacts on environmental assets and water access licence holders.

Issue	Status
The rainfall and runoff reductions under the wet and dry climate change scenarios produce a medium risk within the Intersecting Streams.	Current WSPs already provide water trading and carryover of water allocations to help water licence holders cope with changing climate. Given the long-term nature of climate change trends and the uncertainty about which scenario will actually occur, the situation should be monitored and reassessed when the WRP is next reviewed.

3.7 Improving water quality

The Basin Plan requires the WRP to specify measures to contribute to the achievement of water quality objectives. It also requires the plan to describe strategies to manage risks arising from water quality degradation, or explain why a risk cannot be addressed by the WRP.

Section 2.5 describes the status of water quality in the Intersecting Streams WRPA. Changes to land use and natural river flows are the main causes of water quality problems within the catchment. The risk assessment identifies where water quality degradation is a risk to values and uses of water.

Issue	Status
There are locations where turbidity, nutrients, pH and dissolved oxygen results are outside of target ranges (see Section 2.5). The risks to ecological values range from low to high: ● Elevated nutrient levels, results in a medium to high risk for most of the WRPA apart from the Warrego River. Poor water quality at these locations also impacts on Aboriginal people's health and wellbeing and their cultural and spiritual values as described in Section 3.2.	Co-operative natural resource management between community and government can mitigate some of these risks and reduce water quality degradation. DPI Water will work with partner agencies to identify those actions and suggest priority actions. Flow management can be of benefit in reducing some water quality risks. DPI Water will identify and assess improvements and changes to flow management as part of development of the water resource plan.
Thermal pollution is not an ecological risk in the Intersecting Streams WRPA	
There are elevated levels of salinity in the Culgoa and Narran Rivers from time to time, which are a high risk to ecological values. There is a low risk of irrigated crop damage arising from the salinity of water taken from the Intersecting Streams. There is uncertainty in the	NSW is party to the Basin Salinity Management Strategy 2030. Under this Strategy the government is monitoring salinity and where needed identifying and implementing measures for salinity management.

assessment, as it did not address the timing of higher salinity levels compared to the timing of the take of water for irrigation.	
Harmful algal blooms can occur in the rivers anywhere in this WRPA. Harmful algal blooms are caused by still, clear, warm water and high level of nutrients. More common in weir pools and at times of low flow.	NSW currently manages the risk of human exposure to blue-green algal blooms through a coordinated regional approach with the Regional Algal Coordination Committees. Land and flow management may be of benefit in reducing harmful algal bloom risks. DPI Water will identify and assess possibilities as part of development of the water quality management plan.

3.8 Managing in extreme events

The Basin Plan requires the WRP to describe how critical water needs will be met in extreme events. Extreme events in this context include severe droughts and water quality events that could put at risk the supply of water for both human consumption requirements and non-human consumption requirements, for which a failure to provide for would cause prohibitively high social, economic and/or national water security costs.

Issue	Status
Severe droughts are possible, and unanticipated water quality events or system failures could occur. The current WSPs are unlikely to meet the requirements of the Basin Plan during extreme events.	Councils responsible for town water supply commonly have drought management plans that include how water will be supplied in extreme events. These include measures such as backup supplies from groundwater, and plans for emergency infrastructure if needed. DPI Water will assess whether further measures are warranted as part of developing the Regional Water Strategy. A state-wide approach for the management of extreme events is being developed by DPI Water for consultation.
Review water sharing arrangements during extreme drought.	A WRP is required to provide detail on how the water resources will be managed during an extreme dry period. DPI Water is currently developing a policy which will inform the WRPs on this matter.

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Appendices

Appendix 1: Draft objectives and strategies

Following from the evaluation of a number of water sharing plans, DPI Water is in the process of improving the logic framework of WSPs to make objectives more relevant, and to clarify the relationship between objectives, strategies and performance indicators. This will help to properly frame the review of strategies and rules so that the impact on all objectives can be considered. It will also lead to the development of improved performance indicators, leading to more meaningful and efficient monitoring, reporting and evaluation of the plan after it is implemented.

Table 3 shows draft objectives with related strategies for the WRP. They will be refined as the plan is being developed, including harmonising with objectives being developed in parallel for the Intersecting Streams LTWP. They are presented here as a guide.

Table 3: Draft objectives for the WRP with related strategies

BROAD OBJECTIVES	TARGETED OBJECTIVES	PROPOSED STRATEGIES
ENVIRONMENTAL		
Maintain or enhance the ecological condition of this water source and its dependent ecosystems (instream, riparian and floodplain) over the long-term	Maintain or improve population structure of native fish in medium and high value unregulated water sources	• Protect low flows and/or pools • Maintain a diversion limit • Restrict trading into water sources
	Maintain or improve the connectivity and dispersal potential of fauna within unregulated water sources	• Protect low flows and/or pools • Protect a proportion of medium to high flows • Maintain diversion limits
	Maintain or improve the quantity, diversity and water quality conditions of low flow refugia habitats	• Protect low flows and/or pools
	For wetlands and other water-dependent ecosystems, maintain quality of water sufficient to protect and restore the ecosystems	• Identify and encourage cost-effective measures to address identified medium and high risks to ecosystems related to water quality degradation, and to contribute to achieving the defined targets where they are not being met • Consider effect on water quality in any proposed changes to water management for other purposes
ECONOMIC		
Maximise the economic benefits derived from the use of irrigated water and from dependent industries supporting regional communities	Maintain or improve water access opportunities in low risk unregulated river systems so they meet enterprise requirements	• Provide clearly defined water sharing rules and arrangements • Provide flexible water trading rules • Provide flexible account management rules • Ensure changes to water management for other purposes do not have third party impacts on licence water rights that are not able to be negated or offset

	Maintain or improve water access opportunities in the regulated river systems	• Provide clearly defined water sharing rules and arrangements. • Provide flexible water trading rules • Provide flexible account management rules • Ensure changes to water management for other purposes do not have third party impacts on licence water rights that are not able to be negated or offset
	Maintain or improve water quality to minimise crop yield loss or soil degradation when used in accordance with best irrigation and crop management practices	• Implement the Basin Salinity Management Strategy 2030
Maximise the economic benefits derived from water-dependent commercial and industrial enterprises	Ensure sufficient water is available to local water utilities in the river system	• Provide for growth in local water utility entitlement • Ensure priority is given to maintaining town water supply needs
SOCIAL and CULTURAL		
Ensure adequate water supply to support critical human needs and basic landholder rights	Ensure sufficient water available to local water utilities in the Intersecting Streams unregulated river systems	• Provide for growth in local water utility licences where necessary • Ensure priority is given to maintaining town water supply needs
	Maintain access to water for domestic and stock rights	• Provide for growth in domestic and stock requirements where necessary • Ensure sufficient water is set aside in storages to provide supply in the Intersecting Streams unregulated water sources • Give priority to domestic and stock water right needs
	Minimise water quality risks from raw water taken for treatment for human consumption including the risk of the odour of drinking water being offensive to consumers, and maintain the palatability rating of the water	• Continue to implement Drinking Water Management Systems as required by water suppliers operating licences.
Maintain or improve Aboriginal values, uses and assets which support and strengthen community	Maintain access for Native Title Rights	• Provide for growth in Native Title Rights • Ensure sufficient water is set aside in storage to provide supply in the rivers • Give priority to maintaining Native Title Rights water needs
	Improve opportunities for Aboriginal communities to access water	• Provide access licences for Aboriginal cultural use • Provide flexible water trading

		rules ● Provide flexible account management rules
	Maintain or improve water quality for Aboriginal communities values and uses	● Explore options to manage when developing Water Quality Management Plan.
Maintain or improve fishing, swimming and other recreational uses of water	Minimise the risk to recreational water users from water quality issues caused by potentially toxic blue green algae	● Implement regional algal contingency plans ● Identify and encourage cost-effective measures to minimise algal blooms
	Maintain or improve population of fish in unregulated water sources	● Protect low and/or pools ● Maintain a diversion limit

Table 4 provides a summary of objectives identified through broader Aboriginal community engagement. This list of objectives will be further assessed based on submissions received for this *Status and Issues Paper*.

Table 4: Objectives identified by Aboriginal peoples through consultation

Objective 1	To identify opportunities to better address the needs and aspirations of Aboriginal communities in terms of equitable access to water for social, cultural, spiritual and economic purposes.
Objective 2	To ensure that Aboriginal communities' issues and concerns have been carefully considered with appropriate provisions that ensure the long-term sustainability of their cultural values and uses.
Objective 3	To support the removal of barriers that constrain and limit equitable access to water for Aboriginal communities, by reviewing policy gaps and legislation.
Objective 4	To ensure Aboriginal communities are appropriately consulted and informed of issues affecting their ability to participate in the decision-making process.
Objective 5	To identify and address water quality issues that are impacting on the Aboriginal values and uses across the WRPA. These impacts include the cultural connections to iconic species (fish, vegetation and birds), as well as the instream use of water for swimming, drinking and maternal use.
Objective 6	To address and identify the impacts on the spiritually-significant cultural values. Management of water quantity as well as water quality to inform the protection of these values and uses.

Appendix 2: Additional issues identified by Aboriginal communities

Issue	Status
The term 'Cultural Flows' is identified by all Basins' Aboriginal Nations as an essential entitlement. Although cultural flows are often viewed as being similar to environmental flows, they provide social, spiritual, cultural and economic benefits that can't be satisfied by environmental flows or specific-purpose Aboriginal cultural water licences. Cultural and economic flows need to be considered as an entitlement within the WSP and WRP.	No provisions for cultural flow entitlement in the WSP.
Aboriginal Community Development Licences - The current Aboriginal Community Development water licence provisions are not equitable in general for Aboriginal people across NSW. There are no real opportunities for Aboriginal people to access water for economic use within the surface or groundwater sources within the Basin. There needs to be real opportunities that deliver real benefits for Aboriginal people that allow Aboriginal people to become involved in the water market, and create employment opportunities for Aboriginal people.	These licences may only be issued in coastal river systems, subject to the relevant WSP providing for applications to be made.
Constraints in the uptake of water licences - Aboriginal people do not have the capacity to access the water in terms of water infrastructure and cost of water licensing. This has made it impossible for Aboriginal communities to take up water licensing opportunities. In terms of funding to purchase water licences and water infrastructure - mostly all Aboriginal land councils and individuals have land that they wish to develop, but find it impossible to purchase water licences due to lack of funds. The creation of the water market has added to these difficulties. Aboriginal communities are seeking support in terms of waiving the cost of water licences and looking at additional opportunities for 'excess' water.	Aboriginal communities/individuals have no or limited capacity or the funding to enter into the water market.
Critical human water needs - Aboriginal remote communities have no access to basic drinking water. Many communities in the Basin have issues with accessing water for basic human needs to maintain health,	Current water quality across the WRPA is not sufficient for human consumption direct from the surface water source.

hygiene and wellbeing. The current state of water quality in many systems does not provide water of reasonable health standard for a number of reasons including fertilizer and sediment run-off, various forms of pollution, bank erosion and riparian zone clearing.	
Water quality issues are impacting the general health of the river and connected groundwater systems. This includes the health and reproduction of cultural food resources (e.g. fish are covered in sore spots). Water quality is also significantly important to spiritual and ceremonial sites and the general health of the river and aquifer systems.	Limited data for the WRP processes to address water quality considerations regarding Aboriginal values and uses.