

# **Gwydir Long Term Water Plan**

## **Part B: Gwydir planning units**

**Draft for exhibition**





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## **Acknowledgement of Traditional Owners**

The Office of Environment and Heritage pays its respect to the Traditional Owners and their Nations of the Murray-Darling Basin. The contributions of earlier generations, including the Elders, who have fought for their rights in natural resource management are valued and respected.

In relation to the Gwydir catchment, the Office of Environment and Heritage pays its respects to the Traditional Owners – the Gomeroi Nation – past, present and future. We look forward to building upon existing relationships to improve the health of our rivers and wetlands including in recognition of their traditional and ongoing cultural and spiritual significance.

# Abbreviations

AHIMS	Aboriginal Heritage Information Management System
ASL	Above Sea Level
Basin Plan	Murray-Darling Basin Plan 2012
BCT	Biodiversity Conservation Trust
BF	Baseflow
BK	Bankfull
BWS	Basin-wide environmental watering strategy
CAG	Customer Advisory Group
CAMBA	China-Australia Migratory Bird Agreement
CEWO	Commonwealth Environmental Water Office
CF	Cease-to-flow
DBH	Diameter at breast height
DO	Dissolved oxygen
DOC	Dissolved organic carbon
DOI–W	NSW Department of Industry – Lands and Water
DPIF	NSW Department of Primary Industries Fisheries
EEC	Endangered ecological community
EWA	Environmental water allowance
EWAG	Environmental Water Advisory Group
EWR	Environmental water requirement
FFDI	Forest Fire Danger Index
GCM	Global Climate Model
GDE	Groundwater dependent ecosystem
GL/yr	gigalitres per year
ha	hectares
HEW	Held environmental water
JAMBA	Japan-Australia Migratory Bird Agreement
LF	Large fresh
LLS	Local Land Services (NSW)
LTWP	Long Term Water Plan
m/s	metres per second
MDBA	Murray-Darling Basin Authority
MER	Monitoring, evaluation and reporting
mg/L	milligrams per litre
ML	megalitre
NPWS	NSW National Parks and Wildlife Services
NRAR	Natural Resources Access Regulator

NSW	New South Wales
OB	Overbank
OEH	Office of Environment and Heritage
PCT	Plant community type
PEW	Planned environmental water
PU	Planning unit
RAS	Resource availability scenario
RCM	Regional Climate Model
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
RRG	River red gum
SDL	Sustainable diversion limit
SF	Small fresh
VF	Very low flow
WL	Wetland inundating flow
WQA	Water quality allowance
WQMP	Water quality management plan
WRP	Water resource plan
WRPA	Water resource plan area
WSP	Water sharing plan



# Glossary

Actively managed wetland / floodplain	The area of floodplains and wetlands that can be inundated by managed environmental water deliveries alone or in combination with other flows from regulated river systems (see 'Regulated river').
Adaptive management	A procedure for implementing management while learning about which management actions are most effective at achieving specified objectives.
Allocation	The volume of water made available to water access licence or environmental water accounts in a given year by DOI–W, which is determined within the context of demand, inflows, rainfall forecasts and stored water.
Allochthonous	Organic material (leaf litter, understory plants, trees) derived from outside rivers, including riparian zones, floodplains and wetlands.
Alluvial	Comprised of material deposited by water.
Autochthonous	Organic material derived from photosynthetic organisms (algal and macrophyte growth) within rivers.
Bankfull flow (BK)	River flows at maximum channel capacity with little overflow to adjacent floodplains. These flows engage the riparian zone, anabranches, flood runners and wetlands located within the meander train. They inundate all in-channel habitats including benches, snags and backwaters.
Baseflow (BF)	Reliable background flow levels within a river channel that are generally maintained by seepage from groundwater storage, but also by surface inflows. They typically inundate geomorphic units such as pools and riffle areas.
Basin Plan	The Basin Plan as developed by the Murray-Darling Basin Authority under the <i>Water Act 2007</i> .
Biota	The organisms that occupy a geographic region.
Blackwater	Occurs when water moves across the floodplain and releases organic carbon from the soil and leaf litter. The water takes on a tea colour as tannins and other carbon compounds are released from the decaying leaf litter. The movement of blackwater plays an important role in transferring essential nutrients from wetlands into rivers and vice versa. Blackwater carries carbon which is the basic building block of the aquatic food web and an essential part of a healthy river system.
Carryover	Water allocated to water licences or environmental water accounts that remains un-used in storage at the end of the water year which, under some circumstances, may be held over and used in the following water year.
Catch per unit effort (CPUE)	An indirect measure of the abundance of a target species.
Cease-to-flow (CF)	The absence of flowing water in a river channel that leads to partial or total drying of the river channel. Streams contract to a series of isolated pools.

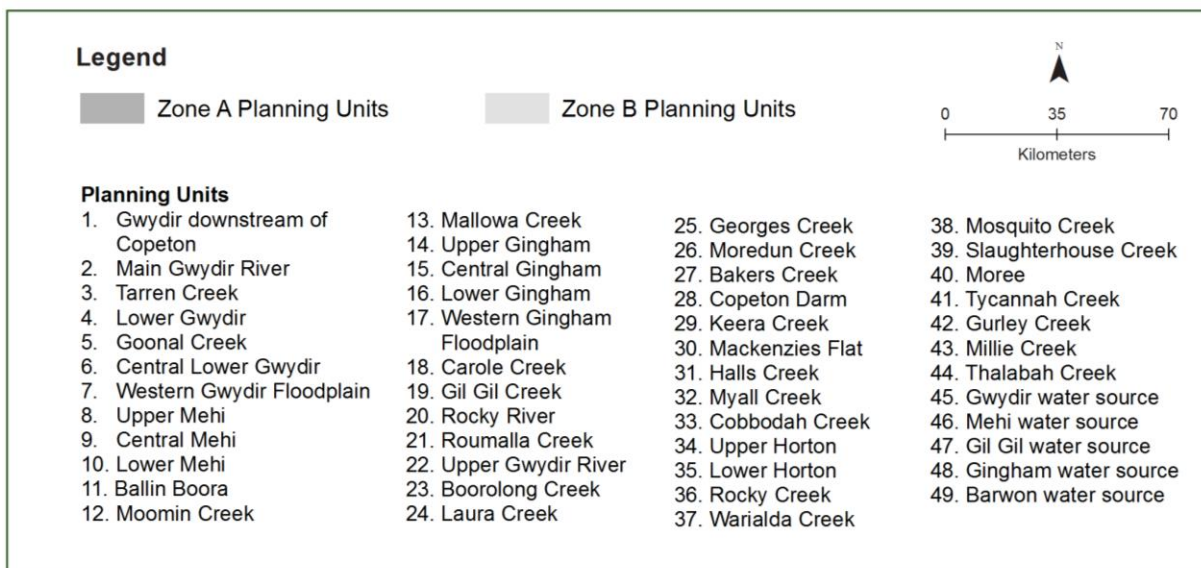
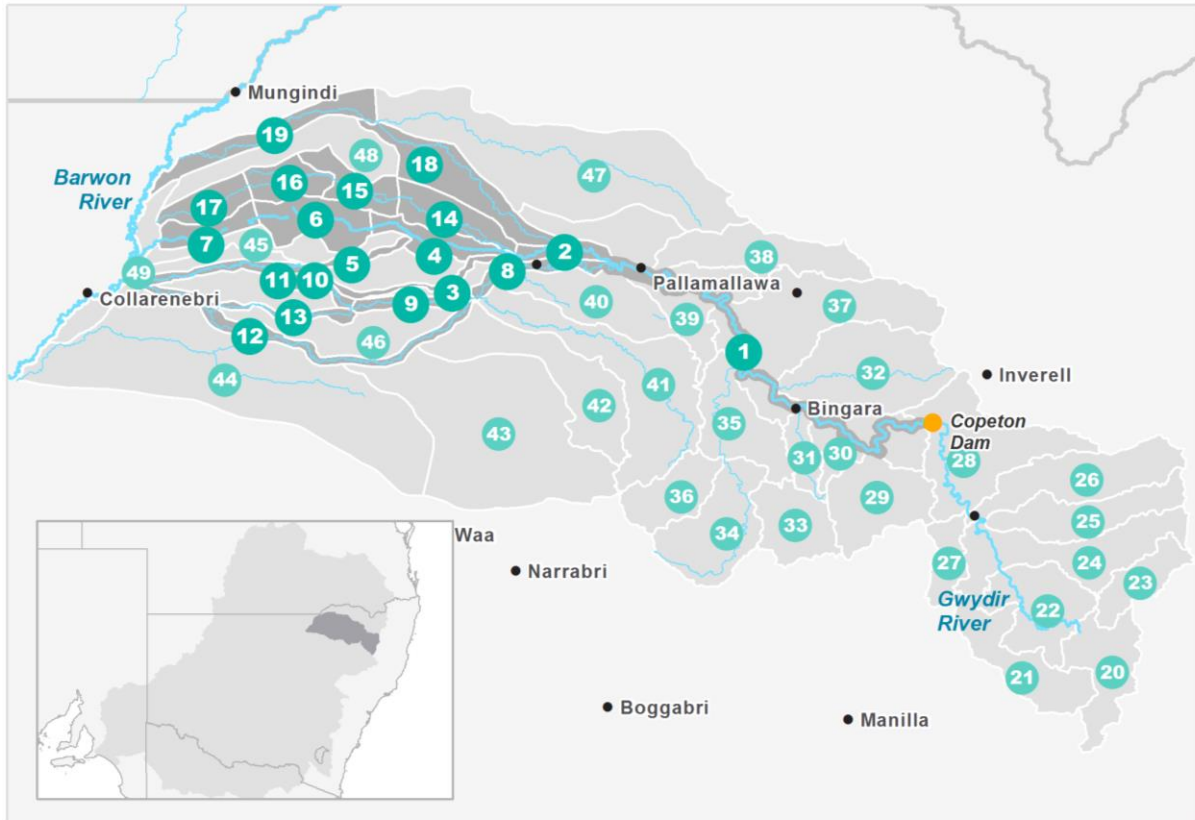
Cease-to-pump (access rule in WSP)	<p>Pumping is not permitted:</p> <ul style="list-style-type: none"> <li>from in-channel pools when the water level is lower than its full capacity</li> <li>from natural off-river pools when the water level is lower than its full capacity</li> <li>from pump sites when there is no visible flow.</li> </ul> <p>These rules apply unless there is a commence to pump access rule that specifies a higher flow rate that licence holders can begin pumping.</p>
Cold water pollution	The artificial lowering of water temperature that occurs downstream of dams, particularly during warmer months when stratification is more likely to occur. The impact of cold water pollution can extend for hundreds of kilometres along the river from the point of release.
Constraints	The physical or operational constraints that affect the delivery of water from storages to extraction or diversion points. Constraints may include structures such as bridges that can be affected by higher flows, the volume of water that can be carried through the river channel, or scheduling of downstream water deliveries from storage.
Consumptive water	Water that is removed from available supplies without return to a water resource system (such as water removed from a river for agriculture).
Cultural water dependent asset	A place that has social, spiritual and cultural value based on its cultural significance to Aboriginal people. Related to the water resource.
Cultural water dependent value	An object, plant, animal, spiritual connection or use that is dependent on water and has value based on its cultural significance to Aboriginal people.
Discharge	The amount of water moving through a river system, most commonly expressed in megalitres per day (ML/d).
Dissolved Organic Carbon (DOC)	A measurement of the amount of carbon from organic matter that is soluble in water. DOC is transported by water from floodplains to river systems and is a basic building block available to bacteria and algae that are food for microscopic animals that are in turn consumed by fish larvae, small bodied fish species, yabbies and shrimp. DOC is essential for building the primary food webs in rivers and ultimately generates a food source for large bodied fish like Murray cod and golden perch and predators such as waterbirds.
Environmental asset	The physical features that make up an ecosystem and meet one or more of the assessment indicators for any of the five criteria specified in Schedule 8 of the Basin Plan.
Ecosystem function	The resources and services that sustain human, plant and animal communities and are provided by the processes and interactions occurring within and between ecosystems. Identified ecosystem functions must also meet one or more of the assessment indicators for any of the four criteria specified in Schedule 9 of the Basin Plan.
Ecological objective	Objective for the protection and/or restoration of an environmental asset or ecosystem function. Objectives are set for all priority environmental assets and priority ecosystem functions, and have regard to the outcomes described in the Basin-wide environmental watering strategy.
Ecological target	Level of measured performance that must be met to achieve the defined objective. The targets in this Long Term Water Plan are SMART (Specific/Measurable/Achievable/Realistic/Time-bound) and can demonstrate progress towards the objectives and the outcomes described in the Basin-wide environmental watering strategy.

Ecological value	An object, plant or animal which has value based on its ecological significance.
Ecosystem	A biological community of interacting organisms and their physical environment. It includes all the living things in that community, interacting with their non-living environment (weather, earth, sun, soil, climate and atmosphere) and with each other.
Environmental Contingency Allowance (ECA)	Held water entitlements, in addition to planned environmental water, up to 45,000 ML held in Copeton Dam to be used for environmental purposes.
Environmental water	Water for the environment. It serves a multitude of benefits to not only the environment, but communities, industry and society. It includes water held in reservoirs (held environmental water) or protected from extraction from waterways (planned environmental water) for the purpose of meeting the water requirements of water dependent ecosystems.
Environmental water requirement (EWR)	The water required to support the completion of all elements of a lifecycle of an organism or group of organisms (taxonomic or spatial), consistent with the objective/target, measured at the most appropriate gauge. It includes all water in the system including natural inflows, held environmental water and planned environmental water.
Flow component	The type of flow in a river defined by its magnitude (e.g. bankfull).
Flow regime	The pattern of flows in a waterway over time that will influence the response and persistence of plants, animals and their ecosystems.
Freshes	Temporary in-channel increased flow in response to rainfall or release from water storages.
Groundwater	Water that is located below the earth's surface in soil pore spaces and in the fractures of rock formations. Groundwater is recharged from, and eventually flows to, the surface naturally.
Held environmental water	Water available under a water access right, a water delivery right, or an irrigation right for the purposes of achieving environmental outcomes (including water that is specified in a water access right to be for environmental use).
Hydrograph	A graph showing the rate of flow and/or water level over time past a specific point in a river. The rate of flow is typically expressed in megalitres per day (ML/d).
Hydrological connectivity	The link of natural aquatic environments.
Hydrology	The occurrence, distribution and movement of water.
Hypoxic Blackwater	Occurs when dissolved oxygen (DO) levels fall below the level needed to sustain native fish and other water dependent species. Bacteria that feed on dissolved organic carbon use oxygen in the water. When they multiply rapidly their rate of oxygen consumption can exceed the rate at which oxygen can be dissolved in the water. As a result, oxygen levels fall and a hypoxic (low oxygen) condition occurs.  Dissolved oxygen is measured in milligrams per litre (mg/L). Generally native fish begin to stress when DO levels fall below 4 mg/L. Fish mortality occurs when DO levels are less than 2 mg/L.
Large fresh (LF)	High-magnitude flow pulse that remains in-channel. These flows may engage flood runners with the main channel and inundate low-lying wetlands. They connect most in-channel habitats and provide partial longitudinal connectivity, as some low-level weirs and other in-channel barriers may be drowned out.



Lateral connectivity	The flow linking rivers channels and the floodplain.
Longitudinal connectivity	The consistent downstream flow along the length of a river.
Long Term Water Plan (LTWP)	A component of the Murray–Darling Basin Plan. Long Term Water Plans give effect to the Basin-wide environmental watering strategy (MDBA 2014) relevant for each river system and will guide the management of water over the longer term. These plans will identify the environmental assets that are dependent on water for their persistence, and match that need to the water available to be managed for or delivered to them. The plan will set objectives, targets and watering requirements for key plants, waterbirds, fish and ecosystem functions. OEH is responsible for the development of nine plans for river catchments across NSW, with objectives for five, 10 and 20-year timeframes.
Montane	Relating to mountainous country.
Overbank flow (OB)	Flows that spill over the riverbank or extend to floodplain surface flows.
Planned environmental water	Water that is committed by the Basin Plan, a water resource plan or a plan made under state water management law to achieving environmental outcomes.
Planning Unit	A division of a water resource plan area based on water requirements (in catchment areas in which water is actively managed), or a sub-catchment boundary (all other areas).
Population structure	A healthy population structure has individuals in a range of age and size classes. These populations demonstrate regular recruitment and good numbers of sexually mature individuals.
Priority environmental asset	A place of particular ecological significance that is water dependent, meets one or more of the assessment indicators for any of the 5 criteria specified in Schedule 8 in the Basin Plan, and can be managed with environmental water. This includes planned and held environmental water.
Priority ecosystem function	Ecosystem functions that meets one or more of the assessment indicators for any of the four criteria specified in Schedule 9 of the Basin Plan and can be managed with environmental water.
Ramsar Convention	An international treaty to maintain the ecological character of key wetlands.
Recruitment	Successful development and growth of offspring; such that they can contribute to the next generation.
Refugium	An area in which a population of plants or animals can survive through a period of decreased water availability.
Registered cultural asset	A cultural water-dependent asset that is registered in the Aboriginal Heritage Information Management System (AHIMS).
Regulated river	A river that is gazetted under the <i>NSW Water Management Act 2000</i> . Flow is largely controlled by major dams, water storages and weirs. River regulation brings more reliability to water supplies but has interrupted the natural flow characteristics and regimes required by native fish and other plant and animal to breed, feed and grow.
Riffle	A rocky or shallow part of a river where river flow is rapid and broken.
Riparian	The part of the landscape adjoining rivers and streams that has a direct influence on the water and aquatic ecosystems within them.
Risk management strategy	A plan of management to overcome risks to achieving environmental outcomes.

Small fresh (SF)	Low-magnitude in-channel flow pulse. Unlikely to drown out any significant barriers but can provide limited connectivity and a biological trigger for animal movement.
Stochastic	Relating to or characterised by random chance.
Substrate	A habitat surface such as a stream bed.
Supplementary access	A category of water entitlement where water is made available to licence holder accounts during periods of high river flows that cannot otherwise be controlled by river operations. Water can be taken and debited from licence accounts during a declared period of high flow.
Surface water	Water that exists above the ground in rivers, streams creeks, lakes and reservoirs. Although separate from groundwater, they are interrelated and over extraction of either will impact on the other.
Sustainable diversion limit (SDL)	The grossed-up amount of water that can be extracted from Murray-Darling Basin rivers for human uses while leaving enough water in the system to achieve environmental outcomes.
Unregulated river	A waterway where flow is mostly uncontrolled by dams, weirs or other structures.
Very low flow (VF)	Small flow in the very-low flow class that joins river pools, thus providing partial or complete connectivity in a reach. These flows can improve DO saturation and reduce stratification in pools.
Water quality management plan (WQMP)	A document prepared by state authorities and accredited by the Commonwealth under the Basin Plan. It forms part of a water resource plan and aims to provide a framework to protect, enhance and restore water quality in each water resource plan area.
Water resource plan (WRP)	A document prepared by state authorities and accredited by the Commonwealth under the Basin Plan. The document describes how water will be managed and shared between users in an area.
Water resource plan area (WRPA)	Catchment-based divisions of the Murray–Darling Basin defined by a water resource plan.
Water sharing plan (WSP)	A plan made under the NSW <i>Water Management Act 2000</i> that sets out specific rules for sharing and trading water between the various water users and the environment in a specified water management area. It forms part of a water resource plan.
Water dependent system	An ecosystem or species that depends on periodic or sustained inundation, waterlogging or significant inputs of water for natural functioning and survival.
Wetland inundation flow (WL)	Flows that fill wetlands below bankfull or via regulating structures over weeks or sometimes months (i.e. longer than a typical fresh/pulse), or flows that are required to inundate wetlands in areas where there are very shallow channels or no discernible channels exist (e.g. terminal wetlands).



**Figure 1** The Gwydir catchment showing the division of planning units into Zone A and Zone B in the Long Term Water Plan





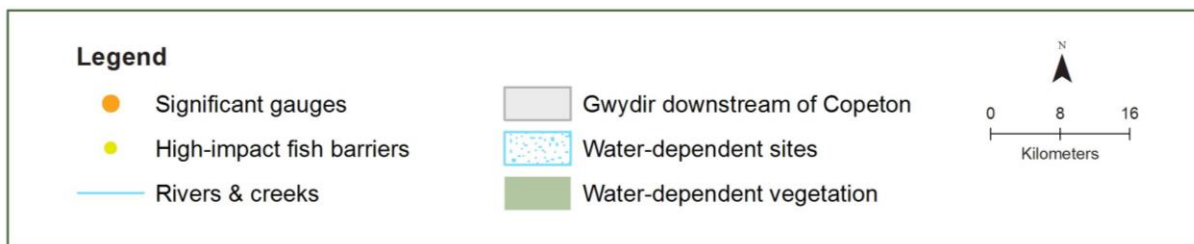
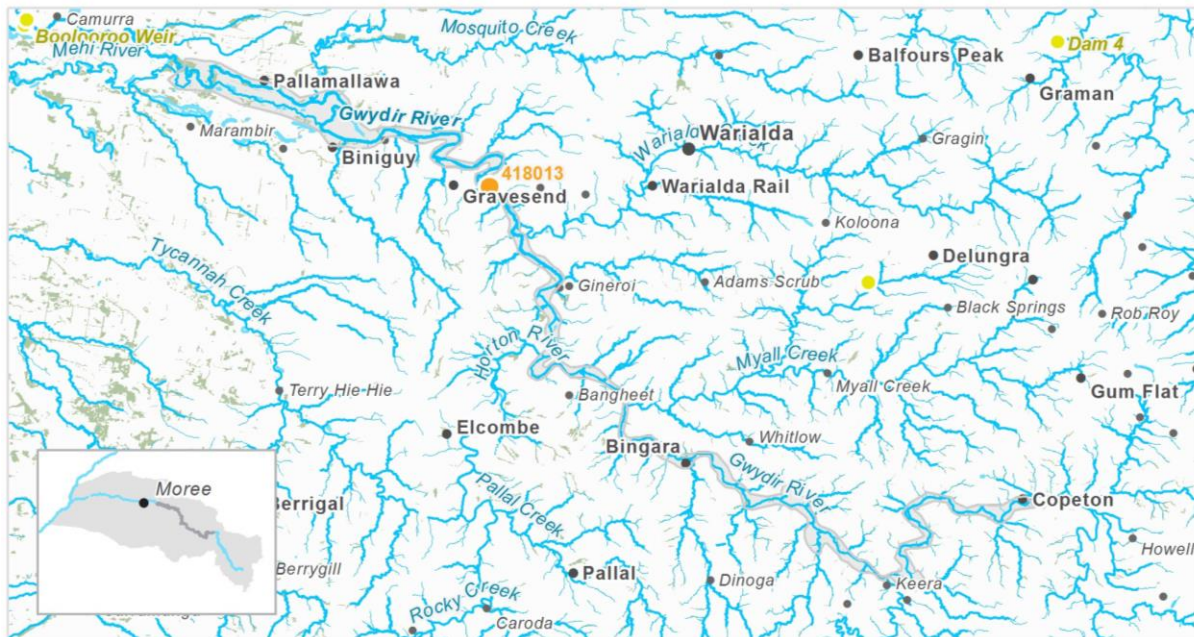
## Zone A planning units

Zone A planning units are located downstream of Copeton Dam on either the Gwydir River or its distributary channels. Held environmental water released from Copeton Dam can be delivered to priority environmental assets in these planning units, together with planned environmental water and water delivered for consumptive use. Although river regulation has typically had a greater influence on the hydrology of Zone A planning units compared to those in Zone B, the associated storage and diversion infrastructure in Zone A has increased the potential for river flows to be targeted and manipulated to meet the needs of the environment.

Planning units in Zone A have been delineated in this LTWP based on how water is managed in each unit. This is primarily determined by the layout of the main watercourses, the lateral extent of the managed floodplain and groups of priority assets with similar water requirements.

The information in this section will help guide water management decision-making in the short-term and contribute to long-term objectives at targets at the regional, catchment and basin scale.

## 1.1 Gwydir River downstream of Copeton Dam



### Priority environmental assets

Patches of high biodiversity  
Gwydir River and associated inchannel habitat and fringing vegetation communities

Lowland Darling River endangered ecological community  
Barbers Lagoon

<b>Native fish</b>	<ul style="list-style-type: none"> <li>• unspotted hardyhead</li> <li>• carp–gudgeon</li> <li>• freshwater catfish</li> <li>• silver perch</li> </ul>	<ul style="list-style-type: none"> <li>• spangled perch</li> <li>• olive perchlet</li> <li>• golden perch</li> <li>• Murray cod</li> </ul>	<ul style="list-style-type: none"> <li>• Australian smelt</li> <li>• bony herring</li> <li>• Murray–Darling rainbowfish</li> </ul>
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**Birds** 61 water-dependent bird species recorded, including eastern great egret and Latham's snipe

**Native vegetation** 16 water-dependent PCTs, including river red gum woodlands and coolibah woodlands

**Registered cultural assets**

- Modified trees



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Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Gwydir @ Gravesend (418013)	0 ML/d	N/A	In line with historical low flow season, typically April to June	10-20 days maximum (hot conditions) or 20-30 days maximum (cooler conditions)	Should occur in no more than 6% of years	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to prevent stratification of pools.
Very-low flow	VF1	Gwydir @ Gravesend (418013)	>30 ML/d	1 year	Any time	200 days minimum (or 50 days minimum in very dry years)	No less than modelled natural	
Baseflow	BF1	Gwydir @ Gravesend (418013)	>440 ML/d	1 year	Any time	160 days minimum (or 20 days minimum in very dry years)	No less than modelled natural	
	BF2	Gwydir @ Gravesend (418013)	>440 ML/d	2 years	September to March	100 days minimum (10 days minimum in very dry years)	5–10 years in 10	
Small fresh	SF1	Gwydir @ Gravesend (418013)	>990 ML/d	1 year	October to April (but can occur any time)	10 days minimum	Annual	These EWRs may not be able to be met by HEW alone with the current volumes that are available and under current constraints. Maximum release rates from Copeton Dam are constrained to 6,500 ML/d. Flows above this threshold are dependent on natural events. HEW may be used to contribute to these flows if delivered in addition to irrigation deliveries in higher irrigation delivery years, or natural events.
	SF2	Gwydir @ Gravesend (418013)	990-8,600 ML/d	2 years	September to April	14 days minimum	5–10 years in 10	

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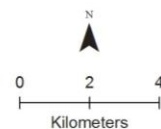
Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Large fresh	LF1	Gwydir @ Gravesend (418013)	>8,600 ML/d	2 years	July to September (but can occur any time)	5 days minimum	5–10 years in 10	<p>These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Maximum release rates from Copeton Dam are constrained to 6,500 ML/d. Flows above this threshold are dependent on natural events. Remaining natural flows must be protected to meet these EWRs.</p> <p>LF3 and LF4 and large overbank events will result in overbank events in downstream planning units. Flows &gt;100,000 ML/d start to break out of bank at Gravesend gauge.</p>
	LF2	Gwydir @ Gravesend (418013)	>8,600 ML/d	4 years	October to April	5 days minimum	3–5 years in 10	
	LF3	Gwydir @ Gravesend (418013)	>26,500 ML/d	4 years	August to February (but can occur any time)	6 days minimum (or 2 days minimum in very dry years)	3–5 years in 10	
	LF4	Gwydir @ Gravesend (418013)	>70,600 ML/d	5 years	September to May (but can occur any time)	4 days minimum (or 1 day minimum in very dry years)	2–3 years in 10	
Bankfull	BK1	Gwydir @ Gravesend (418013)	>90,000-100,000 ML/d	N/A	August to February (but can occur any time)	4 days minimum (or 1 day minimum in very dry years)	2 years in 10	
Large overbank	OB5	Gwydir @ Gravesend (418013)	>100,000 ML/d	10–15 years	Any time	1 day minimum 1–6 months of habitat inundation	1 year in 10	

## 1.2 Main Gwydir River



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks
- Main Gwydir River
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

Yarraman Lagoon

Lowland Darling River endangered ecological community

Gwydir River and associated inchannel habitat and fringing vegetation communities

<b>Native fish</b>	<ul style="list-style-type: none"> <li>• Australian smelt</li> <li>• olive perchlet</li> <li>• freshwater catfish</li> <li>• carp–gudgeon</li> </ul>	<ul style="list-style-type: none"> <li>• Murray–Darling rainbowfish</li> <li>• silver perch</li> <li>• spangled perch</li> <li>• golden perch</li> </ul>	<ul style="list-style-type: none"> <li>• Murray cod</li> <li>• bony herring</li> <li>• unspecked hardyhead</li> </ul>
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**Birds** 47 water-dependent bird species recorded including common sandpiper, eastern great egret, Latham's snipe

**Native vegetation** 11 water-dependent PCTs, including river red gum woodlands, coolibah woodlands and wetland woodlands, and lignum shrubland wetlands

**Registered cultural assets**

- Modified trees

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Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Gwydir @ Yarraman (418004)	0 ML/d	N/A	In line with historical low flow season, typically April to June	30-40 days maximum (hot conditions) or 50-60 days maximum (cooler conditions)	Should occur in no more than 50% of years	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to de-stratify pools.
Very-low flow	VF1	Gwydir @ Yarraman (418004)	>100 ML/d	1 year	Any time	280 days minimum (or 70 days minimum in very dry years)	Annual	
Baseflow	BF1	Gwydir @ Yarraman (418004)	>240 ML/d	1 year	Any time	200 days minimum (or 40 days minimum in very dry years)	Annual	
	BF2	Gwydir @ Yarraman (418004)	>240 ML/d	2 years	September to March	130 days minimum (or 30 days minimum in very dry years)	5–10 years in 10	
Small fresh	SF1	Gwydir @ Yarraman (418004)	>540 ML/d	1 year	October to April (but can occur any time)	10 days minimum	Annual	These EWRs may not be able to be met with HEW alone with the current volumes that are available and under current constraints. Flows >2000 ML/d are dependent on the remaining natural events. HEW may be used to contribute to these flows if delivered in addition to irrigation deliveries in higher irrigation delivery years, or natural events.
	SF2	Gwydir @ Yarraman (418004)	540-4,860 ML/d	2 years	September to April	14 days minimum	5–10 years in 10	
Large fresh	LF1	Gwydir @ Yarraman (418004)	>4,860 ML/d	2 years	July to September (but can occur any time)	5 days minimum	5–10 years in 10	

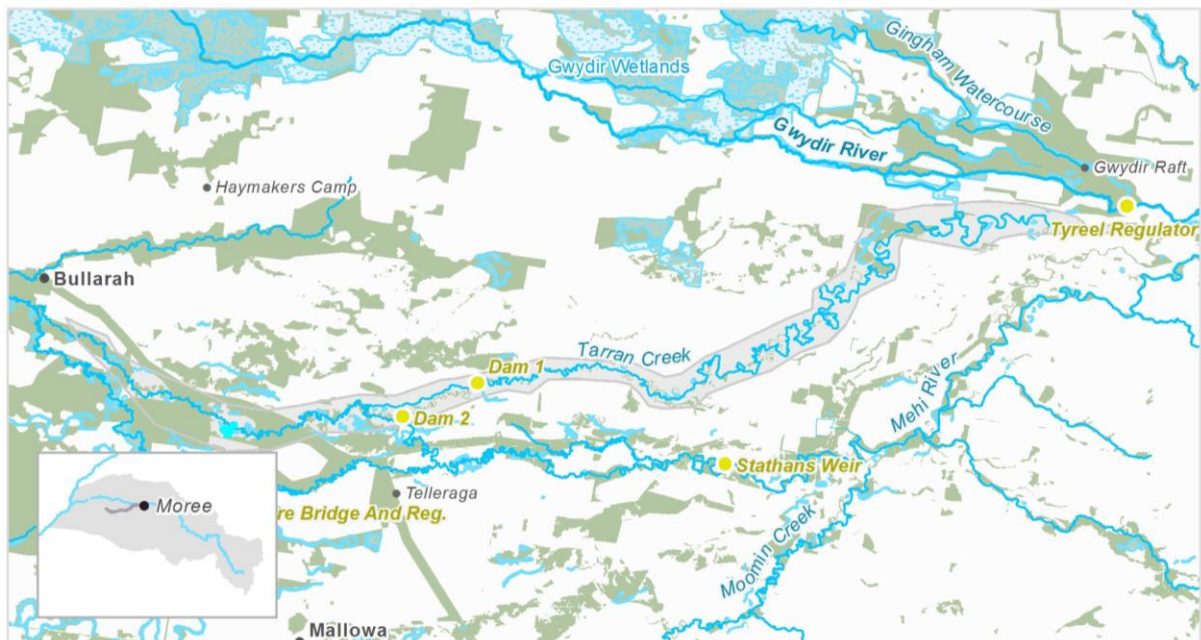


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Flow component	Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
	LF2	Gwydir @ Yarraman (418004)	>4,860 ML/d	4 years	October to April	5 days minimum	3–5 years in 10
	LF3	Gwydir @ Yarraman (418004)	>11,000 ML/d	4 years	August to February (but can occur any time)	2 days minimum (or 1 day minimum in very dry years)	3–5 years in 10
	LF4	Gwydir @ Yarraman (418004)	>40,000 ML/d	5 years	September to May (but can occur any time)	2 days minimum (or 1 day minimum in very dry years)	2–3 years in 10
Bankfull	BK1	Gwydir @ Yarraman (418004)	>50,000–60,000 ML/d	N/A	August to February (but can occur any time)	2 days minimum (or 1 day minimum in very dry years)	2–3 years in 10
Large overbank	OB4	Gwydir @ Yarraman (418004)	>250,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10
	OB5	Gwydir @ Yarraman (418004)	>500,000 ML event (1–3 months)	10 years	Any time	1–6 months of habitat inundation	1 year in 10

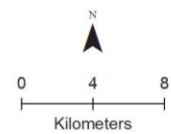
These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >2000 ML/d are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows. LF3 and LF4 and large overbank flows will result in large overbank events in downstream planning units. Flows >60,000 ML/d start to break out of bank at Yarraman gauge.

## 1.3 Tarren Creek



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks
- Tarren Creek
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

Tarren Creek, associated inchannel habitat, and fringing and floodplain wetland communities

**Native fish** • Purple-spotted gudgeon

**Birds** 31 water-dependent bird species recorded, including magpie goose, eastern great egret, Latham's snipe

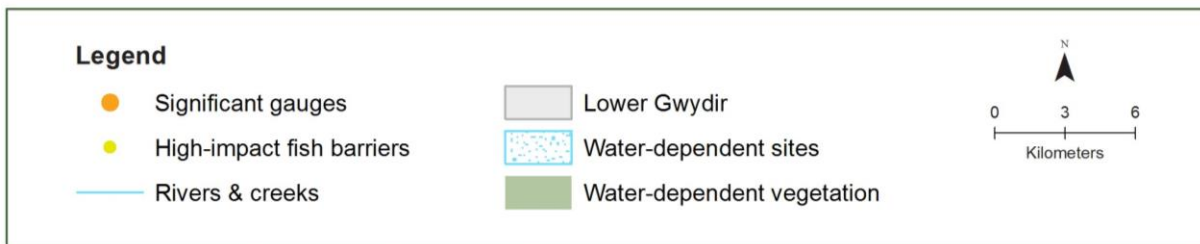
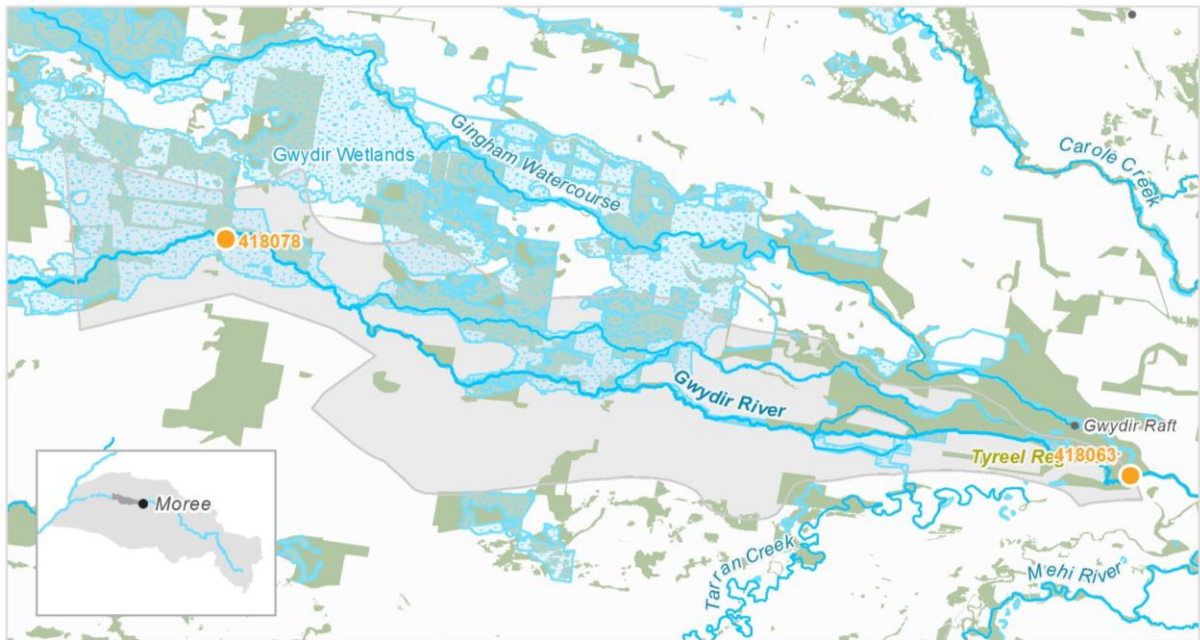
**Native vegetation** Seven water-dependent PCTs, including coolibah woodlands and coolibah wetland woodlands

**Registered cultural assets** None registered

Gwydir Long Term Water Plan Part B: Gwydir planning units  
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Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional description of flow requirements and management limitations
Large overbank	OB4	Gwydir @ Yarraman (418004)	>250,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >2000 ML/d at Gwydir @ Yarraman gauge are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
	OB5	Gwydir @ Yarraman (418004)	>500,000 ML event (1–3 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	

## 1.4 Lower Gwydir



### Priority environmental assets

Gwydir River and associated inchannel habitat and fringing vegetation communities

A portion of the Gwydir Wetlands  
Wirrit Waterhole

Gwydir Watercourse and associated floodplain and wetland vegetation communities

North Arm and Big Leather flow paths

<b>Native fish</b>	• unspecked hardyhead	• olive perchlet	• spangled perch
	• carp–gudgeon	• golden perch	• bony herring
	• freshwater catfish	• Murray cod	• Murray–Darling rainbowfish
	• silver perch	• Australian smelt	

**Birds** 40 water-dependent bird species recorded, including eastern great egret

**Native vegetation** Six water-dependent PCTs, including river red gum woodlands, coolibah woodlands and wetland woodlands, river coobah wetlands

**Registered cultural assets**

- Modified trees
- Burial sites
- Ceremonial grounds/ring

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

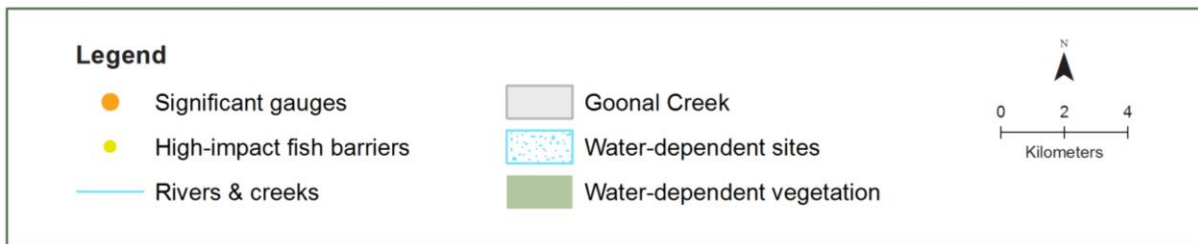
Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Gwydir DS Tyreel (418063)	0 ML/d	N/A	In line with historical low flow season, typically April to June	40–60 days maximum (hot conditions) or 60– 80 days maximum (cooler conditions)	No greater than natural	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to prevent stratification of pools.
Very-low flow	VF1	Gwydir DS Tyreel (418063)	> 50 ML/d	1 year	Any time	230 days minimum (or 40 days minimum in very dry years)	Annual	
Baseflow	BF1	Gwydir DS Tyreel (418063)	>100 ML/d	1 year	Any time	180 days minimum (or 30 days minimum in very dry years)	Annual	
	BF2	Gwydir DS Tyreel (418063)	>100 ML/d	2 years	September to March	100 days minimum (or 20 days minimum in very dry years)	5–10 years in 10	
Small fresh	SF1	Gwydir DS Tyreel (418063)	>250 ML/d	1 year	October to April (but can occur any time)	10 days minimum	Annual	These EWRs may not be able to be met by HEW alone with the current volumes that are available and under current constraints. Flows >1000 ML/d are dependent on the remaining natural events. At the smaller range of flows, HEW may be used to contribute to these flows if delivered in addition to irrigation deliveries in higher irrigation delivery years, or natural events. Otherwise, HEW can only contribute to these flows if it is already in the system when a natural event occurs.
	SF2	Gwydir DS Tyreel (418063)	>250 ML/d	2 years	September to April	14 days minimum	5–10 years in 10	
Large fresh	LF1	Gwydir DS Tyreel (418063)	>800 ML/d	2 years	July to September (but can occur any time)	5 days minimum	5–10 years in 10	
	LF2	Gwydir DS Tyreel (418063)	>800 ML/d	4 years	October to April	5 days minimum	3–5 years in 10	



Gwydir Long Term Water Plan Part B: Gwydir planning units  
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Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Bankfull	BK1	Gwydir DS Tyreel (418063)	>1,500–3,500 ML/d	N/A	August to February (but can occur any time)	5 days minimum (or 2 days minimum in very dry years)	4 years in 10	<p>These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows &gt;1000 ML/d at Gwydir DS Tyreel and &gt;2000 ML/d at Gwydir @ Yarraman are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.</p> <p>These large overbank events will also result in large overbank events in downstream planning units.</p>
Small overbank	OB1	Gwydir @ Allambie (418078)	>10,000 ML event	2 years	September to March (but can occur any time)	3 days minimum, 2–8 months of habitat inundation	7–8 years in 10	
	OB2	Gwydir @ Allambie (418078)	>30,000 ML event	3 years	October to April (but can occur any time)	10 days minimum, 2–6 months of habitat inundation	4–7 years in 10	
	OB3	Gwydir @ Allambie (418078)	>60,000 ML event	4 years	August to February (but can occur any time)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10	
Large overbank	OB4	Gwydir @ Yarraman (418004)	>250,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	
	OB5	Gwydir @ Yarraman (418004)	>500,000 ML event (1–3 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	

## 1.5 Goonal Creek



### Priority environmental assets

Goonal Creek, associated inchannel habitat, and fringing and floodplain wetland vegetation communities

**Native fish** No records

**Birds** 27 water-dependent bird species recorded, including brolga, eastern great egret, Latham's snipe

**Native vegetation** Five water-dependent PCTs, including coolibah woodlands and coolibah wetland woodlands

**Registered cultural assets**

- Modified tree
- Ceremonial ring

Gwydir Long Term Water Plan Part B: Gwydir planning units  
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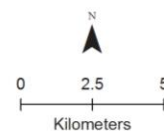
Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional description of flow requirements and management limitations
Large overbank	OB4	Gwydir @ Yarraman (418004)	>250,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >2000 ML/d at Gwydir @ Yarraman gauge are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
	OB5	Gwydir @ Yarraman (418004)	>500,000 ML event (1–3 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	

## 1.6 Central Lower Gwydir



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks
- Central Lower Gwydir
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

Old Dromana Ramsar wetland  
the Gin Holes  
Bulyeroi Lagoon  
Wandoona/Troy Waterhole

The largest area of the Gwydir Wetlands  
Gwydir Watercourse and associated floodplain and wetland  
vegetation communities

<b>Native fish</b>	<ul style="list-style-type: none"> <li>Australian smelt</li> <li>carp–gudgeon</li> <li>Murray–Darling rainbowfish</li> </ul>	<ul style="list-style-type: none"> <li>silver perch</li> <li>spangled perch</li> <li>golden perch</li> </ul>	<ul style="list-style-type: none"> <li>Murray cod</li> <li>bony herring</li> <li>olive perchlet</li> </ul>
<b>Birds</b>	68 water-dependent bird species recorded, including: <ul style="list-style-type: none"> <li>black-necked stork</li> <li>sharp-tailed sandpiper</li> <li>Lantham's snipe</li> <li>magpie goose</li> <li>eastern great egret</li> <li>common greenshank</li> <li>blue-billed duck</li> <li>gull-billed tern</li> <li>cattle egret</li> <li>marsh sandpiper</li> <li>freckled duck</li> </ul>		
<b>Native vegetation</b>	12 water-dependent PCTs, including: <ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>coolibah wetland woodlands</li> <li>river coobah wetlands</li> <li>spike rush mixed marshlands</li> <li>cumbungi rushlands</li> <li>Lignum shrublands</li> <li>water couch marsh grasslands</li> <li>largest remaining area of marsh club-rush sedgeland</li> </ul>		
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Modified trees</li> </ul>		

Gwydir Long Term Water Plan Part B: Gwydir planning units  
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Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Gwydir @ Millewa (418066)	0 ML/d	N/A	In line with historical low flow season, typically April to June	6 months maximum	Should occur in no more than 60% of years	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to de-stratify pools. These EWRs can be met with current volumes of HEW under current constraints in addition to irrigation deliveries and PEW at flows >250 ML/d. Currently HEW may be used to contribute to flows between 250–500 ML/d if delivered in addition to irrigation deliveries in higher irrigation delivery years, or natural events.
Baseflow	BF1	Gwydir @ Millewa (418066)	>50 ML/d	1 year	Any time	190 days minimum (or 30 days minimum in very dry years)	Annual	
	BF2	Gwydir @ Millewa (418066)	>50 ML/d	2 years	September to March	120 days minimum (or 20 days minimum in very dry years)	5–10 years in 10	
Small wetland inundation	WL1	Gwydir @ Millewa (418066)	>6,000 ML event (3–6 months)	1 year	Any time	N/A	9–10 years in 10	These EWRs may not be able to be met with HEW alone with the current volumes that are available and under current constraints. HEW may be used to contribute to these flows if delivered in addition to irrigation deliveries in higher irrigation delivery years, or natural events.
	WL2	Gwydir @ Allambie (418078)	>36,000 ML event (3–6 months)	2 years	September to March (but can occur any time)	2–8 months of habitat inundation	8–9 years in 10	
Large wetland inundation	WL3	Gwydir @ Allambie (418078)	>45,000 ML event (3–6 months)	3 years	October to April	10 days minimum, 2–6 months of habitat inundation	5–8 years in 10	
	WL4	Gwydir @ Allambie (418078)	>65,000 ML event (3–6 months)	5 years	August to February (but can occur any time)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10	



Gwydir Long Term Water Plan Part B: Gwydir planning units  
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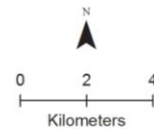
Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Large overbank	OB4	Gwydir @ Yarraman (418004)	>250,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >2000 ML/d at Gwydir @ Yarraman are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows. These large overbank events will also result in large overbank events in downstream planning units.
	OB5	Gwydir @ Yarraman (418004)	>500,000 ML event (1–3 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	

## 1.7 Western Gwydir Floodplain



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks
- Western Gwydir Floodplain
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

Gwydir Watercourse and its associated floodplain vegetation communities

**Native fish** • olive perchlet • silver perch

**Birds** 15 water-dependent bird species recorded

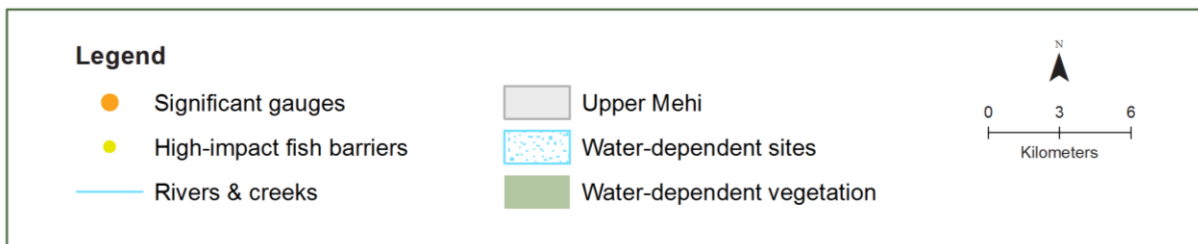
**Native vegetation** Five water-dependent PCTs, including black box woodlands and coolibah woodlands

**Registered cultural assets** • Modified trees

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Large overbank	OB4	Gwydir @ Yarraman (418004)	>250,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >2000 ML/d at Gwydir @ Yarraman gauge are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
	OB5	Gwydir @ Yarraman (418004)	>500,000 ML event (1–3 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	

## 1.8 Upper Mehi



### Priority environmental assets

Mehi River, associated inchannel habitat, and fringing and floodplain wetland vegetation communities

Carlyle Lagoon  
Whittaker Lagoon

<b>Native fish</b>	<ul style="list-style-type: none"> <li>Australian smelt</li> <li>unspecked hardyhead</li> <li>Murray–Darling rainbowfish</li> <li>silver perch</li> </ul>	<ul style="list-style-type: none"> <li>golden perch</li> <li>Murray cod</li> <li>spangled perch</li> </ul>	<ul style="list-style-type: none"> <li>bony herring</li> <li>freshwater catfish</li> <li>carp–gudgeon</li> </ul>

**Birds** 51 water-dependent bird species recorded, including black-necked stork, magpie goose, sharp-tailed sandpiper, and cattle egret and eastern great egret

**Native vegetation** 11 water-dependent PCTs, including river red gum woodlands, coolibah woodlands and coolibah wetland woodlands

**Registered cultural assets**

- Modified trees
- Camping areas

Gwydir Long Term Water Plan Part B: Gwydir planning units  
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Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Mehi @ Moree (418002)	0 ML/d	N/A	In line with historical low flow season, typically April to June	40–60 days maximum (hot conditions) or 60–80 days maximum (cooler conditions)	Should occur in no more than 15% of years	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to prevent stratification of pools.
Baseflow	BF1	Mehi @ Moree (418002)	>130 ML/d	1 year	Any time	190 days minimum (or 140 days minimum in very dry years)	Annual	
	BF2	Mehi @ Moree (418002)	>130 ML/d	2 years	September to March	160 days minimum (or 130 days minimum in very dry years)	5–10 years in 10	
Small fresh	SF1	Mehi @ Moree (418002)	>345 ML/d	1 year	October to April (but can occur any time)	10 days minimum	Annual	These EWRs may not be able to be met by HEW alone with the current volumes that are available and under current constraints. Flows >3,000 ML/d are dependent on the remaining natural events. At the smaller range of flows, current volumes of HEW may be used to contribute to these flows if delivered in addition to irrigation deliveries in higher irrigation delivery years, or natural events.
	SF2	Mehi @ Moree (418002)	345–2,800 ML/d	2 years	September to April	14 days minimum	5–10 years in 10	
Large fresh	LF1	Mehi @ Moree (418002)	>2,800 ML/d	2 years	July to September (but can occur any time)	5 days minimum	5–10 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >3,000 ML/d at Mehi @ Moree are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
	LF2	Mehi @ Moree (418002)	>2,800 ML/d	4 years	October to April	5 days minimum	3–5 years in 10	



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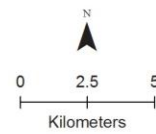
Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Bankfull	BK1	Mehi @ Moree (418002)	>10,000–20,000 ML/d	N/A	August to February (but can occur any time)	3 days minimum (or 1 days minimum in very dry years)	3–5 years in 10	These larger events will also result in large overbank events in downstream planning units.
Small overbank	OB3	Mehi @ Moree (418002)	>20,000 ML/d	4 years	August to February (but can occur any time)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10	
Large overbank	OB4	Mehi @ Moree (418002)	>150,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	
	OB5	Mehi @ Moree (418002)	>250,000 ML event (3–4 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	

## 1.9 Central Mehi



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks
- Central Mehi
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

Mehi River, associated inchannel habitat, and fringing and floodplain wetland vegetation communities

Minnaminane Waterhole  
Coolibah Waterholes  
Cobban Lagoon

<b>Native fish</b>	<ul style="list-style-type: none"> <li>• Australian smelt</li> <li>• unspecked hardyhead</li> <li>• Murray–Darling rainbowfish</li> <li>• silver perch</li> </ul>	<ul style="list-style-type: none"> <li>• golden perch</li> <li>• Murray cod</li> <li>• spangled perch</li> </ul>	<ul style="list-style-type: none"> <li>• bony herring</li> <li>• freshwater catfish</li> <li>• carp–gudgeon</li> </ul>
<b>Birds</b>	39 water-dependent bird species recorded, including eastern great egret and Latham's snipe		
<b>Native vegetation</b>	11 water-dependent PCTs, including: <ul style="list-style-type: none"> <li>• river red gum woodlands</li> <li>• coolibah woodlands and coolibah wetland woodlands</li> <li>• water couch marsh grasslands</li> </ul>		
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>• Modified trees</li> <li>• Camping areas</li> </ul>		

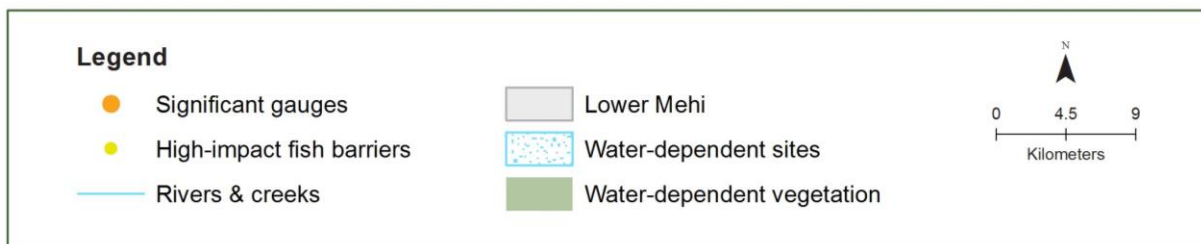
Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Mehi DS Combadello (418037)	0 ML/d	N/A	In line with historical low flow season, typically April to June	40–60 days maximum (hot conditions) or 60–80 days maximum (cooler conditions)	Should occur in no more than 71% of years	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to prevent stratification of pools.
Baseflow	BF1	Mehi DS Combadello (418037)	>80 ML/d	1 year	Any time	200 days minimum (or 130 days minimum in very dry years)	Annual	
	BF2	Mehi DS Combadello (418037)	>80 ML/d	2 years	September to March	160 days minimum (or 100 days minimum in very dry years)	5–10 years in 10	
Small fresh	SF1	Mehi DS Combadello (418037)	>220 ML/d	1 year	October to April (but can occur any time)	10 days minimum	Annual	These EWRs can be met with current volumes of HEW under current constraints in addition to irrigation deliveries and PEW at flows <2,200 ML/d.
	SF2	Mehi DS Combadello (418037)	220–1,500 ML/d	2 years	September to April	14 days minimum	5–10 years in 10	
Large fresh	LF1	Mehi DS Combadello (418037)	>1,500 ML/d	2 years	July to September (but can occur any time)	5 days minimum	5–10 years in 10	These EWRs may not be able to be met by HEW alone with the current volumes that are available and under current constraints. Flows >2,200 ML/d are dependent on the remaining natural events. Currently, at the smaller range of flows, HEW may be used to contribute to these flows if delivered in addition to irrigation deliveries in higher irrigation delivery years, or natural events.
	LF2	Mehi DS Combadello (418037)	>1,500 ML/d	4 years	October to April	5 days minimum	3–5 years in 10	

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Bankfull	BK1	Mehi DS Combadello (418037)	>8,400–16,000 ML/d	N/A	August to February (but can occur any time)	3 days minimum (or 1 days minimum in very dry years)	3–5 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >3,000 ML/d at Mehi @ Moree are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows. These larger events will also result in large overbank events in downstream planning units.
Small overbank	OB3	Mehi @ Moree (418002)	>20,000 ML/d	4 years	August to February (but can occur any time)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10	
Large overbank	OB4	Mehi @ Moree (418002)	>150,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	
	OB5	Mehi @ Moree (418002)	>250,000 ML event (3–4 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	

## 1.10 Lower Mehi



### Priority environmental assets

Mehi River, associated inchannel habitat, and fringing and floodplain wetland vegetation communities

<b>Native fish</b>	<ul style="list-style-type: none"> <li>Australian smelt</li> <li>unspecked hardyhead</li> <li>Murray–Darling rainbowfish</li> <li>silver perch</li> </ul>	<ul style="list-style-type: none"> <li>spangled perch</li> <li>golden perch</li> <li>Murray cod</li> </ul>	<ul style="list-style-type: none"> <li>carp–gudgeon</li> <li>bony herring</li> <li>freshwater catfish</li> </ul>
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**Birds** 39 water-dependent bird species recorded including the eastern great egret

<b>Native vegetation</b>	11 water-dependent PCTs, including:		
	<ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>coolibah woodlands and coolibah wetland woodlands</li> </ul>	<ul style="list-style-type: none"> <li>black box woodland wetlands</li> </ul>	<ul style="list-style-type: none"> <li>lignum shrubland wetlands</li> </ul>

<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Modified trees</li> </ul>	<ul style="list-style-type: none"> <li>Ceremonial rings</li> </ul>
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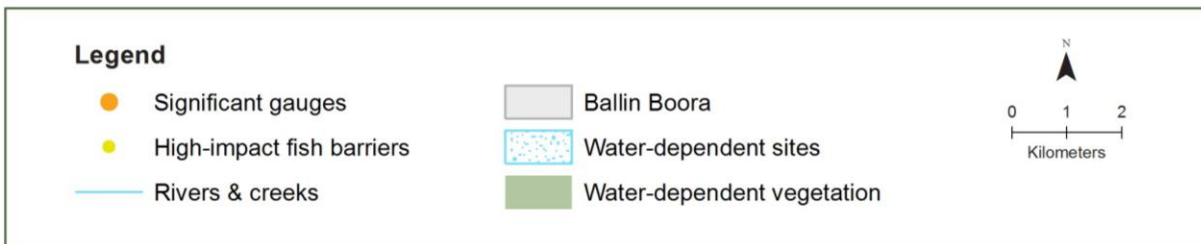
Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Mehi DS Gundare (418041)	0 ML/d	N/A	In line with historical low flow season, typically April to June	40–60 days maximum (hot conditions) or 60–80 days maximum (cooler conditions)	Should occur in no more than 60% of years	
Baseflow	BF1	Mehi DS Gundare (418041)	>50 ML/d	1 year	Any time	230 days minimum (or 130 days minimum in very dry years)	Annual	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to prevent stratification of pools.
		Mehi near Collarenebri (418055)	>40 ML/d			170 days minimum (or 70 days minimum in very dry years)		
	BF2	Mehi DS Gundare (418041)	>50 ML/d	2 years	September to March	160 days minimum (or 100 days minimum in very dry years)	5–10 years in 10	
Small fresh	SF1	Mehi DS Gundare (418041)	>100 ML/d	1 year	October to April (but can occur anytime)	10 days minimum	Annual	These EWRs can be met with current volumes of HEW under current constraints in addition to irrigation deliveries and PEW at flows <1,000 ML/d.
	SF2	Mehi DS Gundare (418041)	100–850 ML/d	2 years	September to April	14 days minimum	5–10 years in 10	
	SF3	Mehi near Collarenebri (418055)	>90 ML/d	4 years	October to April (but can occur any time)	10 days minimum	Within 12 months following LF5	
Large fresh	LF1	Mehi DS Gundare (418041)	>850 ML/d	2 years	July to September (but can occur any time)	5 days minimum	5–10 years in 10	These EWRs may not be able to be met by HEW alone with the current volumes that are available and under current constraints. Flows >1,000 ML/d are dependent



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Flow component	Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
LF2	Mehi DS Gundare (418041)	>850 ML/d	4 years	October to April	5 days minimum	3–5 years in 10	on the remaining natural events. Currently, at the smaller range of flows, HEW may be used to contribute to these flows if delivered in addition to irrigation deliveries in higher irrigation delivery years, or natural events. Remaining natural flows must be protected to ensure the higher range of flows can occur in the system.
	Mehi near Collarenebri (418055)	>800 ML/d	4 years	July to September (but can occur any time)	5 days minimum	Triggered when LF1 at Barwon @ Collarenebri is detected within 18 months of LF2 at Darling @ Wilcannia	
Small overbank	OB1	Mehi @ Moree (418002)	>65,000 ML event (2–3 months)	2 years	September to March (but can occur any time)	2–8 months of habitat inundation	7–8 years in 10
	OB2	Mehi @ Moree (418002)	>85,000 ML event (1–2 months)	3 years	October to April	10 days minimum, 2–6 months of habitat inundation	4–7 years in 10
	OB3	Mehi @ Moree (418002)	>130,000 ML event (1–2 months)	4 years	August to February (but can occur anytime)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10
Large overbank	OB4	Mehi @ Moree (418002)	>150,000 ML event (1–2 months)	5 years	September to May	3–8 months of habitat inundation	2–3 years in 10
	OB5	Mehi @ Moree (418002)	>250,000 ML event (3–4 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10

## 1.11 Ballin Boora Creek



### Priority environmental assets

Ballin Boora Creek and associated floodplain wetland vegetation communities

**Native fish** • silver perch • purple-spotted gudgeon

41 water-dependent bird species recorded, including

**Birds**

- black-necked stork
- the cattle egret
- common greenshank
- eastern great egret
- sharp-tailed sandpiper
- marsh sandpiper
- magpie goose

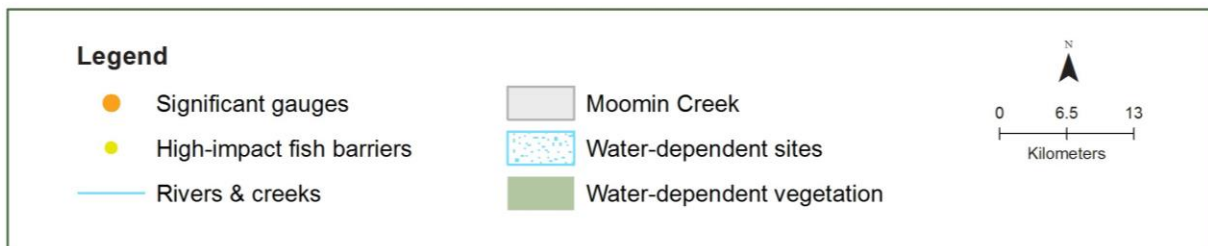
**Native vegetation** Five water-dependent PCTs, including coolibah wetland woodlands and riparian river cooba wetlands, river redgum woodlands, Cumbungi wetlands, and lignum shrublands

**Registered cultural assets** None registered

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Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Baseflow	BF1	No gauge (metered only)	600–1,200 ML event delivered at 10–50 ML/d via infrastructure	3 years	Any time	12–120 days	N/A	
Small overbank	OB1	Mehi US Ballin Boora (418068)	>3,000 ML event (>2,000 ML/d)	2 years	September to March (but can occur any time)	1 day minimum, 2–8 months of habitat inundation	7–8 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >3,000 ML/d at Mehi @ Moree are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
	OB2	Mehi US Ballin Boora (418068)	>7,000 ML event (>2,000 ML/d)	3 years	October to April (but can occur any time)	2 days minimum, 2–6 months of habitat inundation	4–7 years in 10	
	OB3	Mehi US Ballin Boora (418068)	>21,000 ML event (>2,000 ML/d)	4 years	August to February (but can occur any time)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10	
Large overbank	OB4	Mehi US Ballin Boora (418068)	>54,000 ML event (>2,000 ML/d)	5 years	September to May (but can occur any time)	9 days minimum, 3–8 months of habitat inundation	2–3 years in 10	
		Mehi @ Moree (418002)	>150,000 ML event (1–2 months)			3–8 months of habitat inundation		
	OB5	Mehi @ Moree (418002)	>250,000 ML event (3–4 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	

## 1.12 Moomin Creek



### Priority environmental assets

Moomin Creek, associated inchannel habitat, and fringing and floodplain wetland vegetation communities

Mongyer Lagoon  
Coolibah Lagoon

<b>Native fish</b>	<ul style="list-style-type: none"> <li>Australian smelt</li> <li>carp–gudgeon</li> <li>Murray–Darling rainbowfish</li> </ul>	<ul style="list-style-type: none"> <li>silver perch</li> <li>spangled perch</li> <li>golden perch</li> </ul>	<ul style="list-style-type: none"> <li>Murray cod</li> <li>bony herring</li> </ul>
<b>Birds</b>	39 water-dependent bird species recorded, including gull-billed tern and eastern great egret		
<b>Native vegetation</b>	13 water-dependent PCTs, including <ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>black box woodland</li> <li>coolibah woodlands and coolibah wetland woodlands</li> <li>lignum shrubland wetlands</li> <li>water couch marsh grasslands</li> </ul>		
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Modified trees</li> </ul>	<ul style="list-style-type: none"> <li>Midden and open camp sites</li> </ul>	

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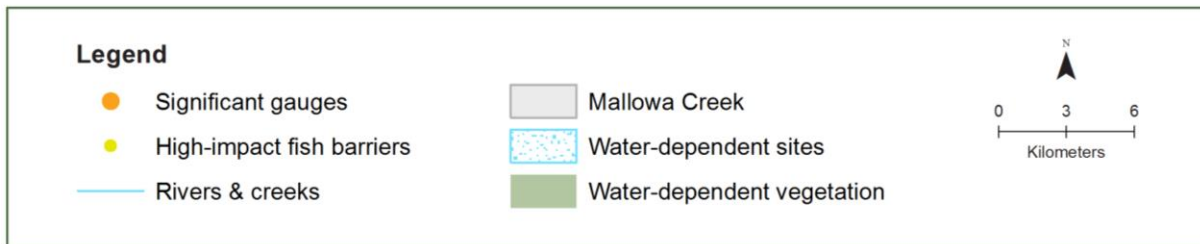
Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Moomin @ Combadello (418048)	0 ML/d	N/A	In line with historical low flow season, typically April to June	Events should not persist longer than 70 days	Should occur in no more than 90% of years	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to prevent stratification of pools.
Baseflow	BF1	Moomin @ Combadello (418048)	>30 ML/d	1 year	Any time	200 days minimum (or 120 days minimum in very dry years)	Annual	
	BF2	Moomin @ Combadello (418048)	>30 ML/d	2 years	September to March	170 days minimum (or 140 days minimum in very dry years)	5–10 years in 10	
Small fresh	SF1	Moomin @ Combadello (418048)	>80 ML/d	1 year	October to April (but can occur any time)	10 days minimum	Annual	These EWRs can be met with current volumes of HEW under current constraints in addition to irrigation deliveries and PEW at flows <1,500 ML/d. Remaining natural flows must be protected to ensure the higher range of flows can occur in the system.
	SF2	Moomin @ Combadello (418048)	80–500 ML/d	2 years	September to April	14 days minimum	5–10 years in 10	
Large fresh	LF1	Moomin @ Combadello (418048)	>500 ML/d	2 years	July to September (but can occur any time)	5 days minimum	5–10 years in 10	
	LF2	Moomin @ Combadello (418048)	>500 ML/d	4 years	October to April	5 days minimum	3–5 years in 10	

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Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Bankfull	BK1	Moomin @ Combadello (418048)	>2,200–3,000 ML/d	N/A	August to February (but can occur any time)	2 days minimum (or 1 day minimum in very dry years)	5–7 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >3,000 ML/d at Mehi @ Moree are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows. These larger events will also result in large overbank events in downstream planning units.
Small overbank	OB2	Moomin @ Combadello (418048)	>3,000 ML/d	3 years	October to April	10 days minimum, 2–6 months of habitat inundation	4–7 years in 10	
	OB3	Moomin @ Combadello (418048)	>4,000 ML/d	4 years	August to February (but can occur any time)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10	
Large overbank	OB4	Mehi @ Moree (418002)	>150,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	
	OB5	Mehi @ Moree (418002)	>250,000 ML event (3–4 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	



## 1.13 Mallowa Creek



### Priority environmental assets

Mallowa Creek, associated inchannel habitat, and fringing and floodplain wetland vegetation communities

Wetland areas potentially capable of supporting colonial waterbird breeding

<b>Native fish</b>	<ul style="list-style-type: none"> <li>• carp–gudgeon</li> <li>• Murray–Darling rainbowfish</li> <li>• silver perch</li> <li>• spangled perch</li> <li>• golden perch</li> <li>• Murray cod</li> <li>• bony herring</li> <li>• olive perchlet</li> </ul>
<b>Birds</b>	42 water-dependent bird species recorded, including endangered Australian painted snipe and cattle egret and eastern great egret
<b>Native vegetation</b>	<p>Six water-dependent PCTs, including</p> <ul style="list-style-type: none"> <li>• river red gum woodlands</li> <li>• water couch marshlands</li> <li>• river coobah wetland</li> <li>• coolibah woodlands and coolibah wetland woodlands</li> <li>• Lignum shrublands</li> <li>• Spike rush mixed marshlands</li> </ul>
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>• Modified trees</li> </ul>

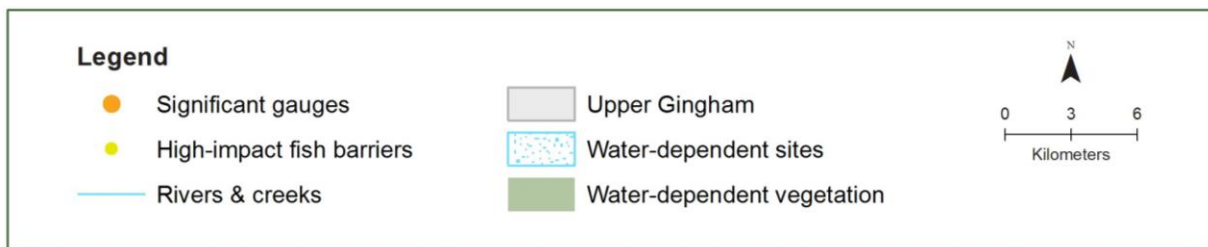
Gwydir Long Term Water Plan Part B: Gwydir planning units  
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Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Mallowa @ Regulator (418049)	0 ML/d	N/A	In line with historical low flow season, typically April to June	Events should not persist longer than 50 days	Should occur in no more than 94% of years	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to prevent stratification of pools.
Baseflow	BF1	Mallowa @ Regulator (418049)	>10 ML/d	1 year	Any time	100 days minimum (or 60 days minimum in very dry years)	Annual	
	BF2	Mallowa @ Regulator (418049)	>10 ML/d	2 years	September to March	60 days minimum (or 20 days minimum in very dry years)	5–10 years in 10	
Small fresh	SF1	Mallowa @ Regulator (418049)	>30 ML/d	1 year	October to April (but can occur any time)	10 days minimum	Annual	These EWRs can be met with current volumes of HEW under current constraints at flows <150 ML/d. Constraints need to be relaxed and the remaining natural flows must be protected to ensure the higher range of flows can occur in the system.
	SF2	Mallowa @ Regulator (418049)	30–150 ML/d	2 years	September to April	14 days minimum	5–10 years in 10	
Large fresh	LF1	Mallowa @ Regulator (418049)	>150 ML/d	2 years	July to September (but can occur any time)	5 days minimum	5–10 years in 10	These EWRs may not be able to be met by HEW alone with the current volumes that are available and under current constraints. Flows >300 ML/d are dependent on the remaining natural events. Constraints need to be relaxed and remaining natural flows
	LF2	Mallowa @ Regulator (418049)	>150 ML/d	4 years	October to April	5 days minimum	3–5 years in 10	
Small wetland inundation	WL1	Mallowa @ Regulator (418049)	>3,000 ML event	18 months	Any time	In line with natural	9–10 years in 10	

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Flow component	Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations	
Large wetland inundation	WL2	Mallowa @ Regulator (418049)	>8,000 ML event (2–4 months)	2 years	September to March (but can occur any time)	2–8 months of habitat inundation	7–9 years in 10	must be protected to meet these flows.
	WL3	Mallowa @ Regulator (418049)	>15,000 ML event (2–4 months)	3 years	October to April	10 days minimum, 2–6 months of habitat inundation	5–7 years in 10	
	WL4	Mallowa @ Regulator (418049)	>22,000 ML event (2–6 months)	5 years	August to February (but can occur any time)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10	
Large overbank	OB4	Mehi @ Moree (418002)	>150,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >1,500 ML/d at Mallowa @ Regulator gauge will require large flows in the Mehi system. Flows >3,000 ML/d at Mehi @ Moree gauge are dependent on the remaining natural events. Constraints need to be relaxed and remaining natural flows must be protected to meet these flows.
	OB5	Mehi @ Moree (418002)	>250,000 ML event (3–4 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	

## 1.14 Upper Gingham



### Priority environmental assets

Gingham Watercourse and associated inchannel habitat and fringing vegetation communities  
Floodplain and wetland vegetation communities  
The Raft  
A portion of the Gingham Wetlands

Remnant wetland including the Gully property (Jackson Paddock) remnant wetlands  
Gwydir Lagoon  
Talmoi, Baroona and Tillaloo Waterholes waterbird breeding habitat

<b>Native fish</b>	<ul style="list-style-type: none"> <li>Australian smelt</li> <li>olive perchlet</li> <li>unspecked hardyhead</li> <li>Murray–Darling rainbowfish</li> </ul>	<ul style="list-style-type: none"> <li>bony herring</li> <li>silver perch</li> <li>spangled perch</li> <li>carp gudgeon</li> </ul>	<ul style="list-style-type: none"> <li>purple-spotted gudgeon</li> <li>Murray cod</li> <li>freshwater catfish</li> <li>golden perch</li> </ul>
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**Birds** 66 water-dependent bird species recorded, including black-necked stork; magpie goose; sharp-tailed sandpiper and common greenshank; brolga; cattle egret and eastern great egret; Latham's snipe, blue-billed duck

**Native vegetation** 14 water-dependent PCTs, including coolibah woodlands and coolibah wetland woodlands; water couch marsh grasslands and wetlands; lignum shrublands; river red gum woodlands

**Registered cultural assets**

- Modified tree

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Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Gingham @ Teralba (418074)	0 ML/d	N/A	In line with historical low flow season, typically April to June	40–60 days maximum (hot conditions) or 60–80 days maximum (cooler conditions)	Should occur in no more than 15% of years	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to prevent stratification of pools.
Very-low flow	VF1	Gingham @ Teralba (418074)	>30 ML/d	1 year	Any time	340 days minimum (or 110 days minimum in very dry years)	Annual	
Baseflow	BF1	Gingham @ Teralba (418074)	>100 ML/d	1 year	Any time	250 days minimum (or 40 days minimum in very dry years)	Annual	
	BF2	Gingham @ Teralba (418074)	>100 ML/d	2 years	September to March	150 days minimum (or 40 days minimum in very dry years)	5–10 years in 10	
Small fresh	SF1	Gingham @ Teralba (418074)	>250 ML/d	1 year	October to April (but can occur any time)	10 days minimum	Annual	These EWRs may not be able to be met by HEW alone with the current volumes that are available and under current constraints. Flows >500 ML/d are dependent on the remaining natural events. Currently, HEW may be used to contribute to these flows if delivered in addition to irrigation deliveries in higher irrigation delivery years, or natural events.
	SF2	Gingham @ Teralba (418074)	250-1,000 ML/d	2 years	September to April	14 days minimum	5–10 years in 10	

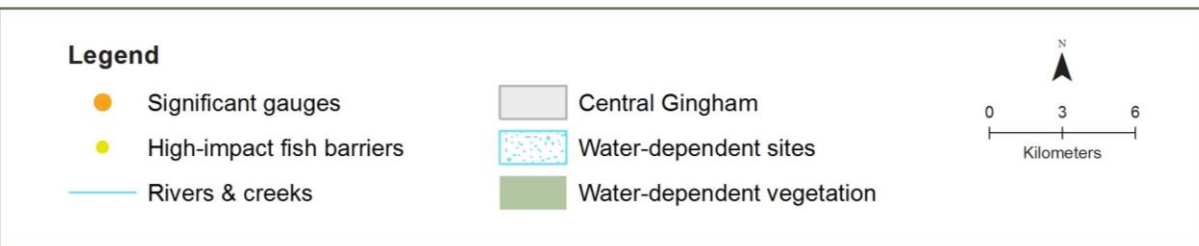


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Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Large fresh	LF1	Gingham @ Teralba (418074)	>1,000 ML/d	2 years	July to September (but can occur any time)	5 days minimum	5–10 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >500 ML/d at Gwydir @ Teralba gauge are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
	LF2	Gingham @ Teralba (418074)	>1,000 ML/d	4 years	October to April	5 days minimum	3–5 years in 10	
Small wetland inundation	WL1	Gingham @ Teralba (418074)	>15,000 ML event (1-3 months)	1 year	Any time	N/A	9-10 years in 10	These EWRs may not be able to be met by HEW alone with the current volumes that are available and under current constraints. Flows >500 ML/d are dependent on the remaining natural events. Currently, HEW may be used to contribute to these flows if delivered in addition to irrigation deliveries in higher irrigation delivery years, or natural events. Remaining natural flows must be protected to meet these flows.
	WL2	Gingham @ Teralba (418074)	>30,000 ML event (1-3 months)	2 years	September to March (but can occur any time)	2–8 months of habitat inundation	8–9 years in 10	
Large wetland inundation	WL3	Gingham @ Teralba (418074)	>45,000 ML event (1-3 months)	3 years	October to April	10 days minimum, 2–6 months of habitat inundation	5–8 years in 10	
	WL4	Gingham @ Teralba (418074)	>60,000 ML event (1-3 months)	5 years	August to February (but can occur any time)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >2000 ML/d at Gwydir @ Yarraman gauge and flows >500 ML/d at Gwydir @ Teralba gauge are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
Large overbank	OB4	Gwydir @ Yarraman (418004)	>250,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	
	OB5	Gwydir @ Yarraman (418004)	>500,000 ML event (1-3 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	



## 1.15 Central Gingham



### Priority environmental assets

Gingham watercourse non-woody wetlands areas of water couch, spike rushes, typha and marsh club-rush

Lagoons and waterholes including Gingham Waterhole, Racecourse and Little Lagoons, Bunnor Waterbird Lagoons, and other unnamed lagoons

Endangered ecological communities, including coolibah woodlands, myall woodlands and marsh club rush

Largest continuous intact area of the Gwydir's mosaic of wetlands remaining on the Gwydir floodplain

Egret, heron and ibis colonial nesting waterbird breeding sites including Bunnor, Lynworth, Yarrol, Muwonga and Glendara

Goddard's Lease Ramsar site

Large areas of productive wetland foraging and waterbird breeding habitat

<b>Native fish</b>	• Australian smelt	• golden perch	• Murray Cod
	• carp–gudgeon	• spangled perch	• bony Herring
	• Murray–Darling rainbowfish	• silver perch	• olive perchlet

90 water-dependent bird species recorded, including

<b>Birds</b>	• magpie goose	• whiskered tern	• black-tailed godwit
	• cattle egret	• silver gull	• common greenshank
	• intermediate egret	• gull-billed tern	• yellow-billed spoonbill
	• eastern great egret	• Caspian tern	• royal spoonbill
	• white-necked heron	• marsh sandpiper	• Australian white ibis
	• little egret	• Australian pelican	• straw-necked ibis
	• white-faced heron	• glossy ibis	• Australian bittern

Priority environmental assets			
	<ul style="list-style-type: none"> <li>• brolga</li> <li>• nankeen night heron</li> <li>• black-necked stork</li> </ul>	<ul style="list-style-type: none"> <li>• sharp-tailed sandpiper</li> <li>• Latham's snipe</li> </ul>	<ul style="list-style-type: none"> <li>• little bittern</li> <li>• Australian painted snipe</li> </ul>
	Patches of Lowland Darling River endangered ecological community and		
<b>Native vegetation</b>	<ul style="list-style-type: none"> <li>• Extensive lignum shrubland</li> <li>• coolibah wetland woodlands</li> </ul>	<ul style="list-style-type: none"> <li>• non-woody wetland vegetation communities</li> </ul>	<ul style="list-style-type: none"> <li>• River red gum woodlands</li> </ul>
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>• Modified trees</li> </ul>		

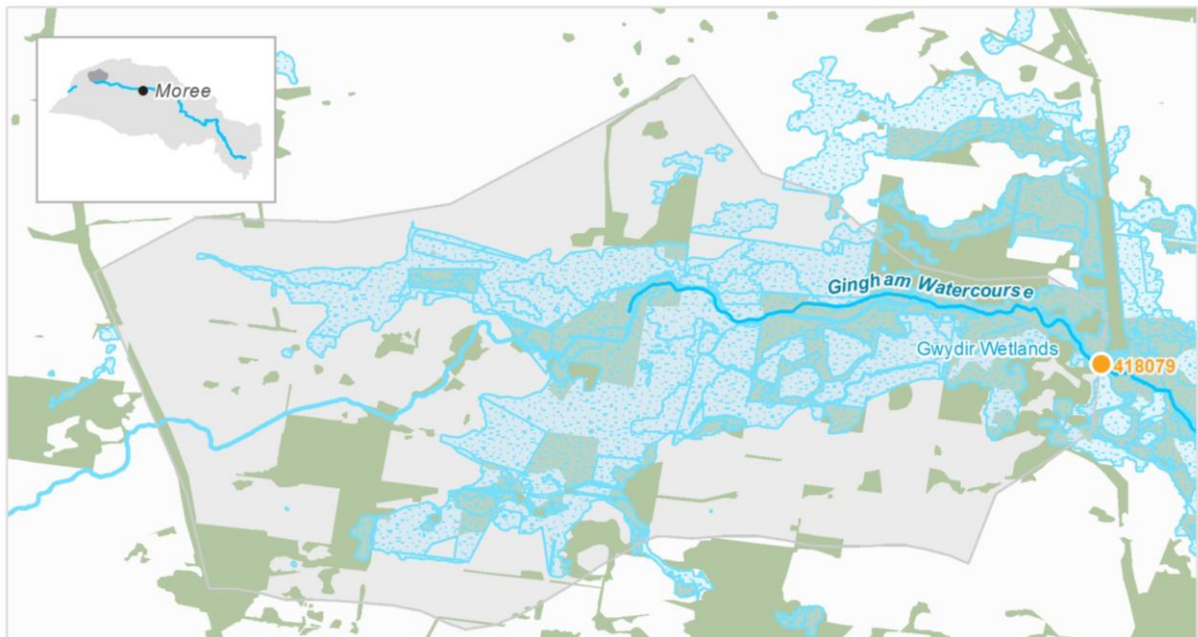
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Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Gingham @ Tillaloo (418076)	0 ML/d	N/A	In line with historical low flow season, typically April to June	Events should not persist longer than 180 days	Should occur in no more than 50% of years	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to prevent stratification of pools.
Very-low flow	VF1	Gingham @ Tillaloo (418076)	>20 ML/d	1 year	Any time	350 days minimum (or 130 days minimum in very dry years)	Annual	
Baseflow	BF1	Gingham @ Tillaloo (418076)	>80 ML/d	1 year	Any time	230 days minimum (or 30 days minimum in very dry years)	Annual	
	BF2	Gingham @ Tillaloo (418076)	>80 ML/d	2 years	September to March	10 days minimum (or 1 days minimum in very dry years)	5–10 years in 10	
Small wetland inundation	WL1	Gingham @ Tillaloo (418076)	>15,000 ML event (2-6 months)	1 year	Any time	N/A	9-10 years in 10	These EWRs may not be able to be met by HEW alone with the current volumes that are available and under current constraints. Flows >250 ML/d are mainly dependent on the remaining natural events. Currently, HEW may be used to contribute to these flows if delivered in addition to irrigation deliveries in higher irrigation delivery years, or natural events. Constraints need to be relaxed and
	WL2	Gingham @ Tillaloo (418076)	>30,000 ML event (2-6 months)	2 years	September to March (but can occur any time)	2–8 months of habitat inundation	8–9 years in 10	
Large wetland inundation	WL3	Gingham @ Tillaloo (418076)	>40,000 ML event (2-6 months)	3 years	October to April	10 days minimum, 2–6 months of habitat inundation	5–8 years in 10	

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

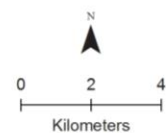
Flow component	Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
WL4	Gingham @ Tillaloo (418076)	>60,000 ML event (2-6 months)	5 years	August to February (but can occur any time)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10	remaining natural flows must be protected to meet these flows.
Large overbank	OB4	Gwydir @ Yarraman (418004)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >2000 ML/d at Gwydir @ Yarraman gauge are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
	OB5	Gwydir @ Yarraman (418004)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	

## 1.16 Lower Gingham



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks
- Lower Gingham
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

Windella and Crinolyn Ramsar sites Bronkeedna Waterhole Brighton Waterhole		A portion of the Gingham Wetlands Boyanga Waterhole Aid Blair Waterhole Waterbird feeding and breeding habitat	
<b>Native fish</b>	<ul style="list-style-type: none"> <li>olive perchlet</li> </ul>	<ul style="list-style-type: none"> <li>silver perch</li> </ul>	
<b>Birds</b>	54 water-dependent bird species recorded, including <ul style="list-style-type: none"> <li>black-necked stork</li> <li>brilga</li> <li>common greenshank</li> <li>eastern great egret</li> </ul>		
<b>Native vegetation</b>	Eight water-dependent PCTs, including <ul style="list-style-type: none"> <li>river coobah wetlands</li> <li>Lignum shrublands</li> <li>coolibah wetland woodlands</li> <li>water couch marsh grasslands</li> </ul>		
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Burial sites</li> </ul>	<ul style="list-style-type: none"> <li>Modified trees</li> </ul>	

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

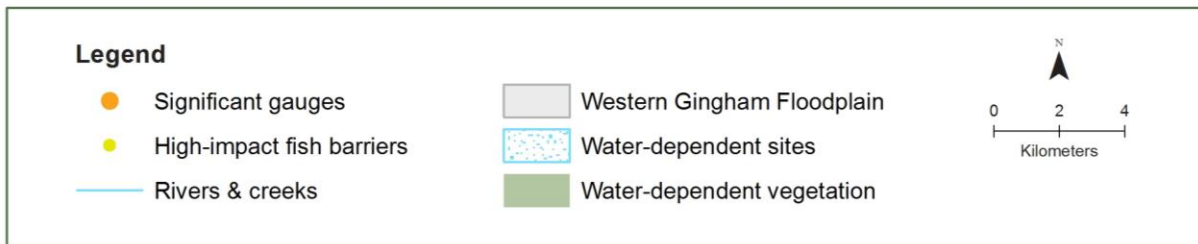
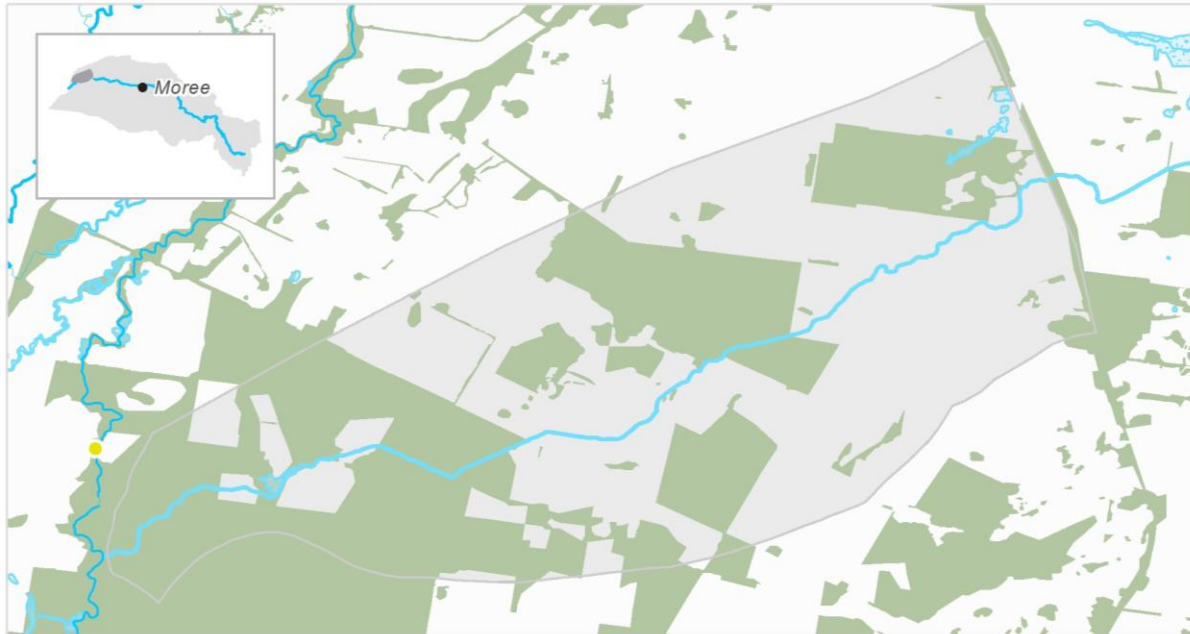
Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Gingham @ Gingham Brd (418079)	0 ML/d	N/A	In line with historical low flow season, typically April to June	Events should not persist longer than 70 days	Should occur in no more than 50% of years	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to prevent stratification of pools.
Very-low flow	VF1	Gingham @ Gingham Brd (418079)	>20 ML/d	1 year	Any time	270 days minimum (or 40 days minimum in very dry years)	Annual	
Small wetland inundation	WL1	Gingham @ Gingham Brd (418079)	>3,000 ML event (1-4 months)	1 year	Any time	N/A	9-10 years in 10	These EWRs may not be able to be met by HEW alone with the current volumes that are available and under current constraints. Flows >250 ML/d at Gwydir @ Tillaloo gauge are mainly dependent on the remaining natural events. Currently, HEW may be used to contribute to these flows if delivered in addition to irrigation deliveries in higher irrigation delivery years, or natural events. Constraints need to be relaxed and remaining natural flows must be protected to meet these flows.
	WL2	Gingham @ Gingham Brd (418079)	>15,000 ML event (1-4 months)	2 years	September to March (but can occur any time)	2–8 months of habitat inundation	8–9 years in 10	
Large wetland inundation	WL3	Gingham @ Gingham Brd (418079)	>20,000 ML event (1-4 months)	3 years	October to April	10 days minimum, 2–6 months of habitat inundation	5–8 years in 10	
	WL4	Gingham @ Gingham Brd (418079)	>30,000 ML event (1-4 months)	5 years	August to February (but can occur any time)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10	



Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Large overbank	OB4	Gwydir @ Yarraman (418004)	>250,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >2000 ML/d at Gwydir @ Yarraman gauge are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
	OB5	Gwydir @ Yarraman (418004)	>500,000 ML event (1-3 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	

## 1.17 Western Gingham Floodplain



### Priority environmental assets

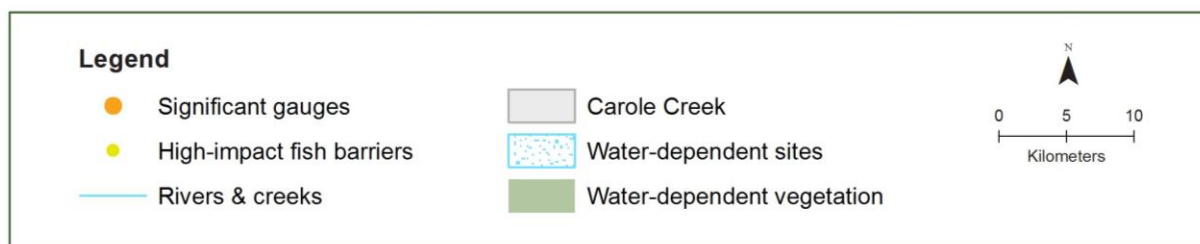
Floodplain vegetation communities associated with the Gingham watercourse

<b>Native fish</b>	<ul style="list-style-type: none"> <li>olive perchlet</li> <li>Murray–Darling rainbowfish</li> <li>purple-spotted gudgeon</li> </ul>	<ul style="list-style-type: none"> <li>silver perch</li> <li>spangled perch</li> <li>golden perch</li> </ul>	<ul style="list-style-type: none"> <li>carp–gudgeon</li> <li>Murray Cod</li> <li>bony Herring</li> </ul>
<b>Birds</b>	Five water-dependent birds recorded, including the brolga		
<b>Native vegetation</b>	Six water-dependent PCTs, including		
	<ul style="list-style-type: none"> <li>black box woodland wetlands</li> <li>River red gum woodlands</li> </ul>	<ul style="list-style-type: none"> <li>coolibah woodlands and wetland woodlands</li> </ul>	<ul style="list-style-type: none"> <li>water couch marsh grasslands</li> </ul>
<b>Registered cultural assets</b>	None registered		

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Large overbank	OB4	Gwydir @ Yarraman (418004)	>250,000 ML event (1–2 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >2000 ML/d at Gwydir @ Yarraman gauge are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
	OB5	Gwydir @ Yarraman (418004)	>500,000 ML event (1-3 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	

## 1.18 Carole Creek



### Priority environmental assets

Boonoona Waterhole

Carole Creek, associated inchannel habitat, and fringing and floodplain wetland vegetation communities

Moorina Waterhole

Moorah Waterhole

<b>Native fish</b>	<ul style="list-style-type: none"> <li>Australian smelt</li> <li>carp–gudgeon</li> <li>Murray–Darling rainbowfish</li> </ul>	<ul style="list-style-type: none"> <li>golden perch</li> <li>Murray cod</li> </ul>	<ul style="list-style-type: none"> <li>bony herring</li> <li>spangled perch</li> </ul>
<b>Birds</b>	39 water-dependent bird species recorded, including <ul style="list-style-type: none"> <li>black-necked stork</li> <li>brolga</li> <li>gull-billed tern</li> </ul>		
<b>Native vegetation</b>	Sixteen water-dependent PCTs, including <ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>black box floodplain woodlands</li> <li>coolibah woodlands and coolibah wetland woodlands</li> <li>lignum shrubland wetlands</li> <li>water couch marsh grasslands</li> </ul>		
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Modified trees</li> </ul>		

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

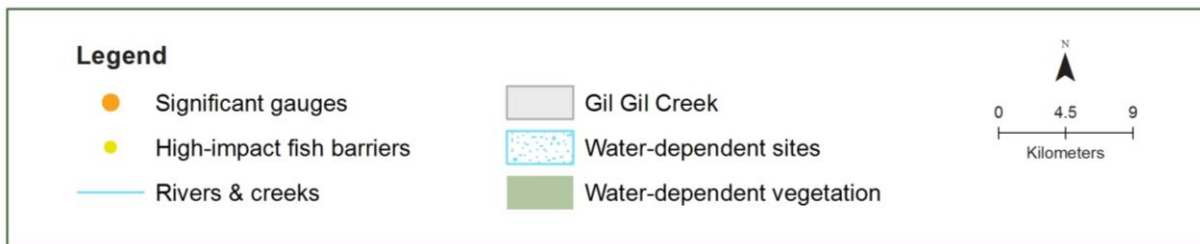
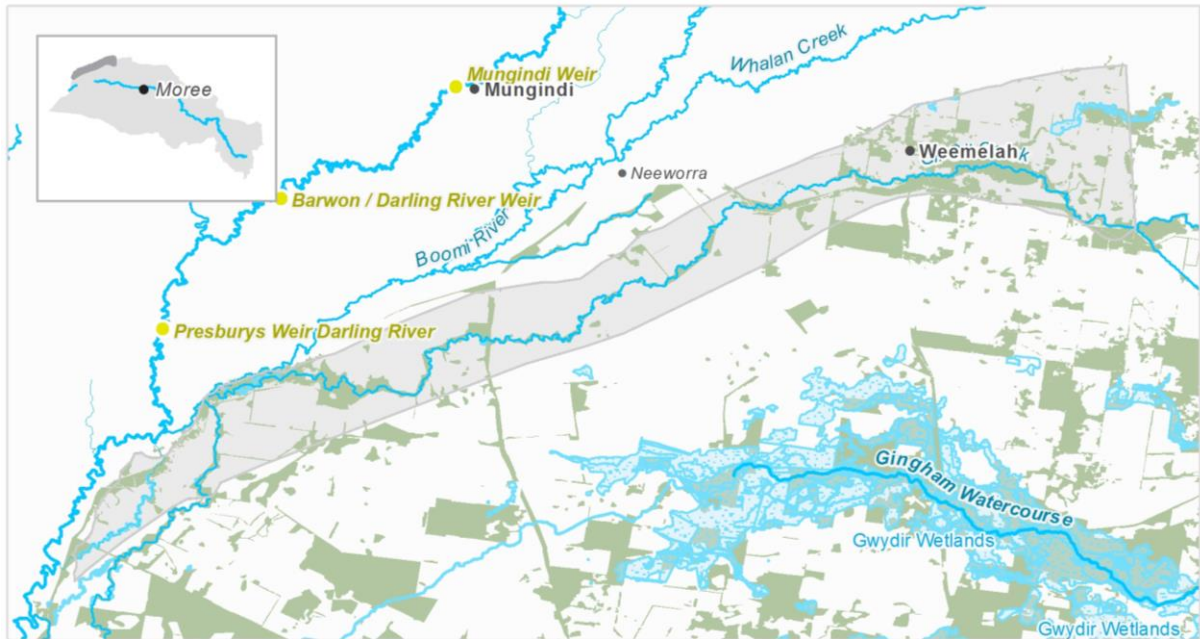
Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Carole near Garah (418052)	0 ML/d	N/A	In line with historical low flow season, typically April to June	40–60 days maximum (hot conditions) or 60–80 days maximum (cooler conditions)	Should occur in no more than 100% of years	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to prevent stratification of pools.
Baseflow	BF1	Carole near Garah (418052)	>70 ML/d	1 year	Any time	160 days minimum (or 100 days minimum in very dry years)	Annual	
	BF2	Carole near Garah (418052)	>70 ML/d	2 years	September to March	140 days minimum (or 90 days minimum in very dry years)	5–10 years in 10	
Small fresh	SF1	Carole near Garah (418052)	>200 ML/d	1 year	October to April (but can occur any time)	10 days minimum	Annual	These EWRs can be met with current volumes of HEW under current constraints in addition to irrigation deliveries and PEW at flows <1,500 ML/d. Remaining natural flows must be protected to ensure the higher range of flows can occur in the system.
	SF2	Carole near Garah (418052)	200-900 ML/d	2 years	September to April	14 days minimum	5–10 years in 10	
Large fresh	LF1	Carole near Garah (418052)	>900 ML/d	2 years	July to September (but can occur any time)	5 days minimum	5–10 years in 10	These EWRs may not be able to be met by HEW alone with the current volumes that are available and under current constraints. Flows >1,500 ML/d are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
	LF2	Carole near Garah (418052)	>900 ML/d	4 years	October to April	5 days minimum	3–5 years in 10	

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Bankfull	BK1	Carole near Garah (418052)	>1,500–2,000 ML/d	N/A	August to February (but can occur any time)	3 days minimum (or 1 days minimum in very dry years)	8–9 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >1,500 ML/d are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
Small overbank	OB1	Carole near Garah (418052)	>2,000 ML/d	2 years	September to March (but can occur any time)	2–8 months of habitat inundation	7–8 years in 10	
	OB2	Carole near Garah (418052)	>3,000 ML/d	3 years	October to April	10 days minimum, 2–6 months of habitat inundation	4–7 years in 10	
	OB3	Carole near Garah (418052)	>5,000 ML/d	4 years	August to February (but can occur any time)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10	
Large overbank	OB4	Carole Creek DS Regulator (418011)	130,000 ML event (3 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	
	OB5	Carole Creek DS Regulator (418011)	160,000 ML event (3 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	



## 1.19 Gil Gil Creek



### Priority environmental assets

Gil Gil Creek, associated inchannel habitat, and fringing and floodplain wetland vegetation communities

Bengerang Waterhole  
Gunnyanna Waterhole  
Wadden Wadden Waterhole

<b>Native fish</b>	<ul style="list-style-type: none"> <li>carp gudgeon</li> <li>Murray–Darling rainbowfish</li> </ul>	<ul style="list-style-type: none"> <li>spangled perch</li> <li>golden perch</li> <li>Australian smelt</li> </ul>	<ul style="list-style-type: none"> <li>Murray cod</li> <li>bony herring</li> </ul>
<b>Birds</b>	54 water-dependent bird species recorded, including <ul style="list-style-type: none"> <li>black-necked stork</li> <li>brolga</li> <li>eastern great egret</li> <li>Latham's snipe</li> </ul>		
<b>Native vegetation</b>	18 water-dependent PCTs, including: <ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>lignum shrublands</li> <li>coolibah woodlands and coolibah wetland woodlands</li> <li>black box woodland</li> <li>water couch marsh grasslands</li> </ul>		
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Modified trees</li> <li>Fishing areas</li> <li>Ceremonial ring</li> </ul>		

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

Flow component	Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Cease-to-flow	CF1	Gil Gil @ Weemalah (416027) Gil Gil @ Galloway (416052)	0 ML/d	N/A	In line with historical low flow season, typically April to June	Events should not persist longer than 35 days	Should occur in no more than 97% of years
Baseflow	BF1	Gil Gil @ Weemalah (416027)	1 year	Any time	130 days minimum (or 70 days minimum in very dry years)	Annual	When restarting flows, avoid harmful water-quality impacts, such as de-oxygenated refuge pools. Flows should ideally be >0.03–0.05 m/s to prevent stratification of pools.
		Gil Gil @ Galloway (416052)			120 days minimum (or 40 days minimum in very dry years)		
	BF2	Gil Gil @ Weemalah (416027)	2 years	September to March	90 days minimum (or 50 days minimum in very dry years)	5–10 years in 10	
Small fresh	SF1	Gil Gil @ Weemalah (416027)	1 year	October to April (but can occur any time)	10 days minimum	Annual	These EWRs can be met with current volumes of HEW under current constraints in addition to irrigation deliveries and PEW at flows <1,000 ML/d at Gil Gil @ Weemalah gauge and <750 ML/d at Gil Gil @ Galloway. Remaining natural flows must be protected to ensure the higher range of flows can occur in the system.
	SF2	Gil Gil @ Weemalah (416027)	2 years	September to April	14 days minimum	5–10 years in 10	
	SF3	Gil Gil @ Galloway (416052)	4 years	October to April (but can occur any time)	10 days minimum	Within 12 months following LF5	

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Large fresh	LF1	Gil Gil @ Weemalah (416027)	>1,900 ML/d	2 years	July to September (but can occur any time)	5 days minimum	5–10 years in 10	These EWRs cannot be met by HEW with the current volumes that are available and under current constraints. Flows >1,000 ML/d at Gil Gil @ Weemalah gauge, >750 ML/d at Gil Gil @ Galloway, and >1,500 ML/d at Carole Creek DS Regulator are dependent on the remaining natural events. Remaining natural flows must be protected to meet these flows.
	LF2	Gil Gil @ Weemalah (416027)	>1,900 ML/d	4 years	October to April	5 days minimum	3–5 years in 10	
	LF5	Gil Gil @ Galloway (416052)	>750 ML/d	4 years	July to September (but can occur any time)	5 days minimum	Triggered when LF1 at Barwon @ Collarenebri is detected within 18 months of LF2 at Darling @ Wilcannia	
Bankfull	BK1	Gil Gil @ Weemalah (416027)	>2,700-3,700 ML/d	N/A	August to February (but can occur any time)	4 days minimum (or 1 days minimum in very dry years)	8 years in 10	
Small overbank	OB1	Gil Gil @ Weemalah (416027)	>3,700 ML/d	2 years	September to March (but can occur any time)	2–8 months of habitat inundation	7–8 years in 10	
	OB2	Gil Gil @ Weemalah (416027)	>10,000 ML/d	3 years	October to April	10 days minimum, 2–6 months of habitat inundation	4–7 years in 10	

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

Flow component		Gauge	Flow rate / volume (event window)	Maximum inter-event period	Timing	Duration	Frequency	Additional water requirement descriptions and current management limitations
Large overbank	OB3	Gil Gil @ Weemalah (416027)	>20,000 ML/d	4 years	August to February (but can occur any time)	5 days minimum, 2–3 months of habitat inundation	3–5 years in 10	
	OB4	Carole Creek DS Regulator (418011)	130,000 ML event (3 months)	5 years	September to May (but can occur any time)	3–8 months of habitat inundation	2–3 years in 10	
	OB5	Carole Creek DS Regulator (418011)	160,000 ML event (3 months)	10–15 years	Any time	1–6 months of habitat inundation	1 year in 10	



## Zone B planning units

Zone B PUs are located upstream of Zone A planning units and cannot be managed with held environmental water. Instead, they rely on natural inflows, rules and conditions that provide planned environmental water in the planning unit, and planned environmental water from upstream planning units to meet the water needs of the priority assets and functions they support.

Rules in the Gwydir WSP that govern access to water for consumptive use are the primary mode of environmental water management in Zone B planning units. To accommodate for this policy-based approach to environmental water management, Zone B planning unit boundaries are based on the water source boundaries described in the *Gwydir Water Resource Plan Risk Assessment*. This means that the water requirements of priority assets and functions in Zone B can be more easily managed through the policy mechanisms that govern planned environmental water in these areas.

### Key to hydrological alteration from *Lachlan Water Resource Plan Risk Assessment* (NSW DOI-W, in prep)

L= Low: less than 20% departure (+/-) from the base case for each hydrologic metric

M = Medium: 20-50% departure (+/-); from the base case for each hydrologic metric

H = High: greater than 50% departure (+/-) from the base case for each hydrologic metric

N/A = no risk outcome or modelling available due to no hydrological data available

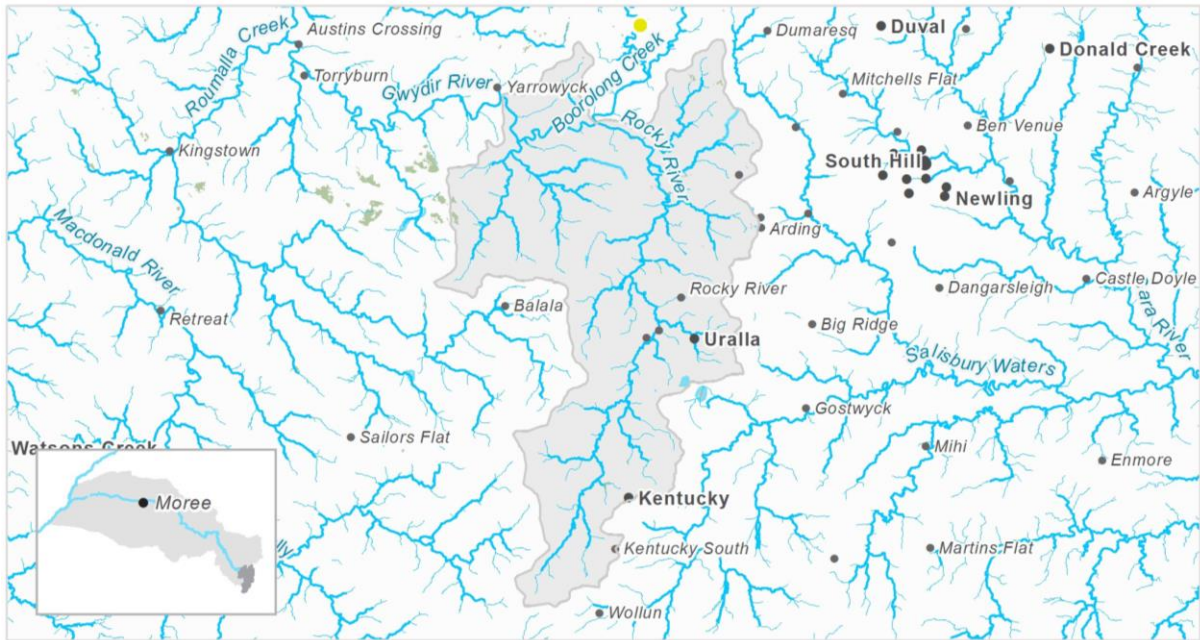
+ increase near-natural condition

- decrease near-natural condition

<sup>0</sup> no change from near-natural condition



## 1.20 Rocky River water source



### Priority environmental assets

Wilsons Creek

Tolleys Gully

Tributaries to Rocky River

Racecourse Lagoon

Rocky River and its associated inchannel habitat and fringing vegetation communities

**Native fish** • purple-spotted gudgeon • freshwater catfish

73 water-dependent bird species recorded, including:

**Birds**

- sharp-tailed sandpiper
- common greenshank
- cattle egret
- Latham's snipe
- marsh sandpiper
- eastern great egret
- blue-billed duck

**Native vegetation** Five water-dependent PCTs, including: river red gum woodlands, sedgeland fens wetlands and upland wetlands

**Registered cultural assets** None registered

### Hydrology

Gauge – Gwydir River at Yarrowick (418014)	80 <sup>th</sup> percentile – 1.9 ML/day	50 <sup>th</sup> percentile – 16.8 ML/day	20 <sup>th</sup> percentile – 98 ML/day
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Cease-to-flow periods and low flows are moderately altered as assessed by the *Gwydir WRPA Risk Assessment*. Cease-to-flow periods currently occur more frequently and low flows occur less frequently compared to the 'without development' model scenario.

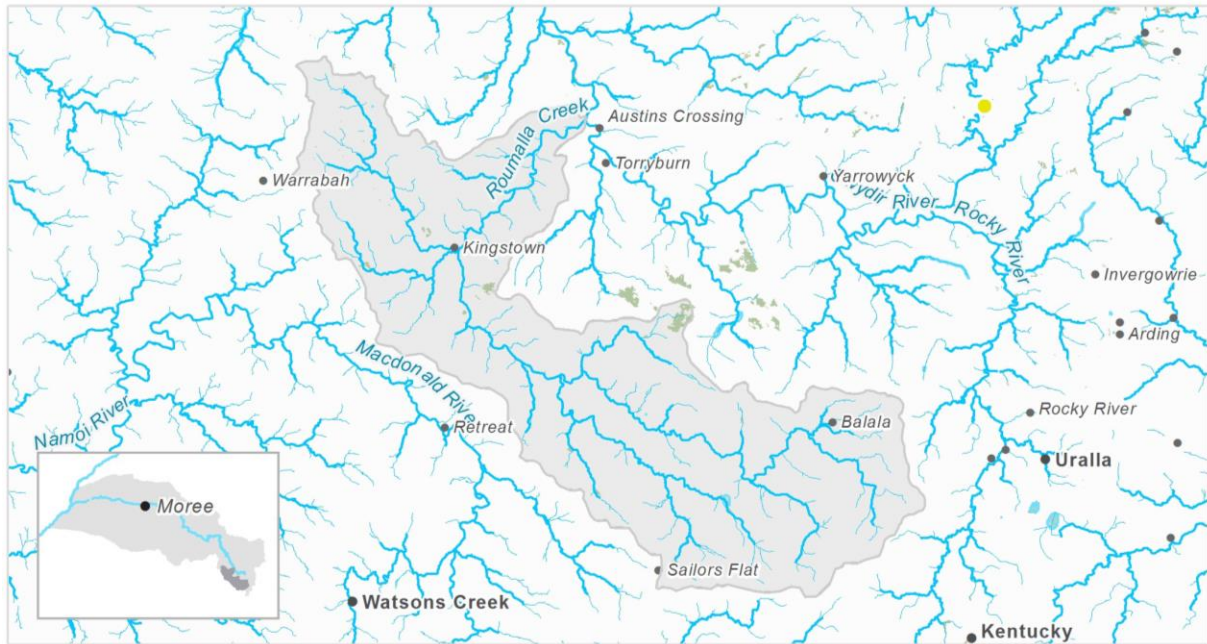
One large licence exists on Kentucky Creek and several small licences are dispersed in the upper part of this planning unit. It is characterised by very low flows, and water is mainly diverted when the

rainfall has been inadequate. This means that lower flows may be impacted by extraction (as confirmed by the risk assessment).

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	M <sup>+</sup>	M <sup>-</sup>	L <sup>-</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			
Recommendations				

- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on baseflows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.

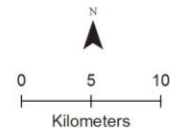
## 1.21 Roumalla Creek water source



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks

- Roumalla Creek Water Source
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

Roumalla Creek and its associated inchannel habitat and fringing vegetation communities

**Native fish** • purple-spotted gudgeon • freshwater catfish

**Birds** 32 water-dependent bird species recorded

**Native vegetation** Four water-dependent PCTs, including river red gum woodlands, sedgeland–forbland wetlands & sedgeland fens wetlands

**Registered cultural assets** None registered

### Hydrology

Gauge – Roumalla Creek (418024)	80 <sup>th</sup> percentile – 2.4ML/day	50 <sup>th</sup> percentile – 17.6ML/day	20 <sup>th</sup> percentile – 103.9ML/day
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Cease-to-flow periods are highly altered and low flows are moderately altered as assessed by the *Gwydir WRPA Risk Assessment*. Cease-to-flow periods currently occur more frequently and low flows occur less frequently compared to the ‘without development’ model scenario.

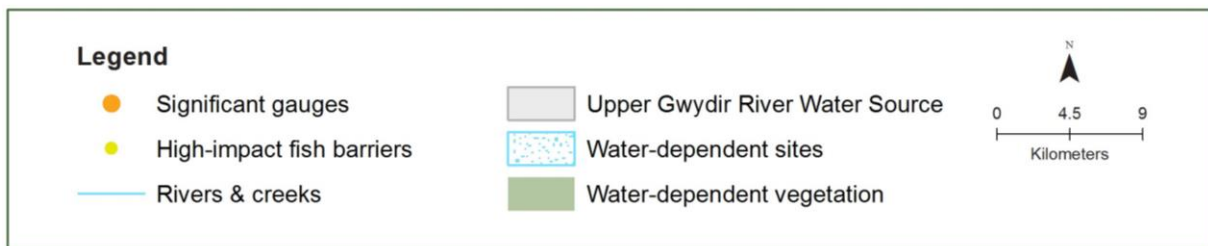
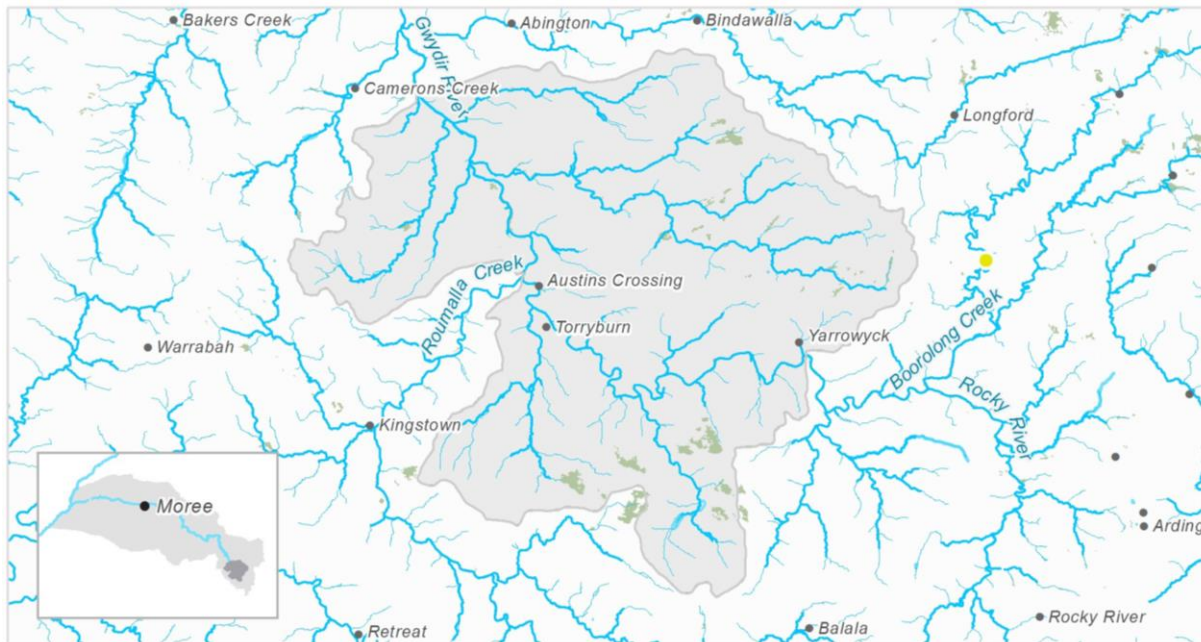
Several small licences are distributed along Roumalla Creek. It is characterised by very low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	M <sup>-</sup>	L <sup>0</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			
Recommendations				

- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on baseflows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.



## 1.22 Upper Gwydir River water source



### Priority environmental assets

Gwydir River and its associated inchannel habitat and fringing vegetation communities

Tributaries to the Gwydir River

<b>Native fish</b>	• Murray cod	• golden perch	• bony herring
	• carp–gudgeon	• Darling river hardyhead	• Australian smelt
	• river blackfish	• freshwater catfish	• mountain galaxias

**Birds** 52 water-dependent bird species recorded, including blue-billed duck, Latham's snipe & eastern great egret

**Native vegetation** Three water-dependent PCTs, including river red gum woodlands & sedgeland fens wetlands

**Registered cultural assets** None registered

### Hydrology

Gauge – Gwydir River at Stonybatter (418029)	80 <sup>th</sup> percentile – 4.6ML/day	50 <sup>th</sup> percentile – 44.6ML/day	20 <sup>th</sup> percentile – 285.3ML/day
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Cease-to-flow periods and low flows are highly altered as assessed by the *Gwydir WRP* Risk Assessment. Cease-to-flow periods currently occur more frequently and low flows occur less frequently compared to the 'without development' model scenario.

Several small licences are distributed throughout the Upper Gwydir River. It is characterised by low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

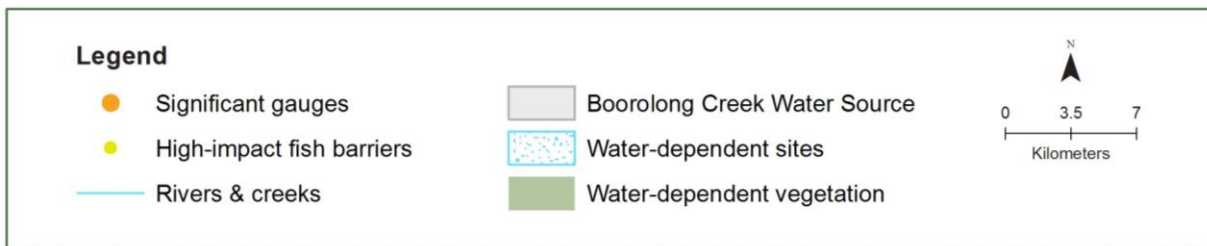
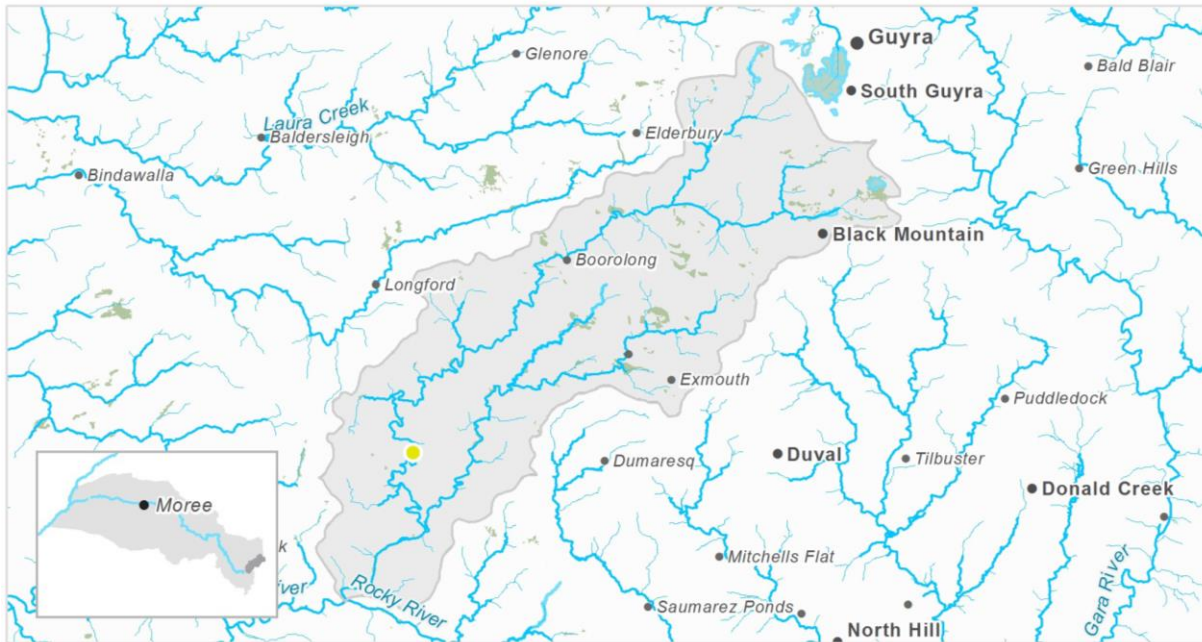
	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H+	H-	L-	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

### Recommendations

- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on baseflows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.



## 1.23 Boorolong Creek water source



### Priority environmental assets

Toms Creek

Boorolong Creek and its associated inchannel habitat and fringing vegetation communities

Tributaries to Boorolong Creek

<b>Native fish</b>	<ul style="list-style-type: none"> <li>purple-spotted gudgeon</li> <li>freshwater catfish</li> </ul>
<b>Birds</b>	28 water-dependent bird species recorded, including the magpie goose
<b>Native vegetation</b>	Five water-dependent PCTs, including <ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>sedgeland fens wetlands</li> <li>heath swamps</li> <li>upland wetlands</li> </ul>
<b>Registered cultural assets</b>	None registered

### Hydrology

Gauge – Boorolong Creek (418020)	80 <sup>th</sup> percentile – 0ML/day	50 <sup>th</sup> percentile – 6.2ML/day	20 <sup>th</sup> percentile – 58.9ML/day
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Baseflows are moderately altered, as assessed by the *Gwydir WRP* Risk Assessment. They currently occur less frequently compared to the 'without development' model scenario.

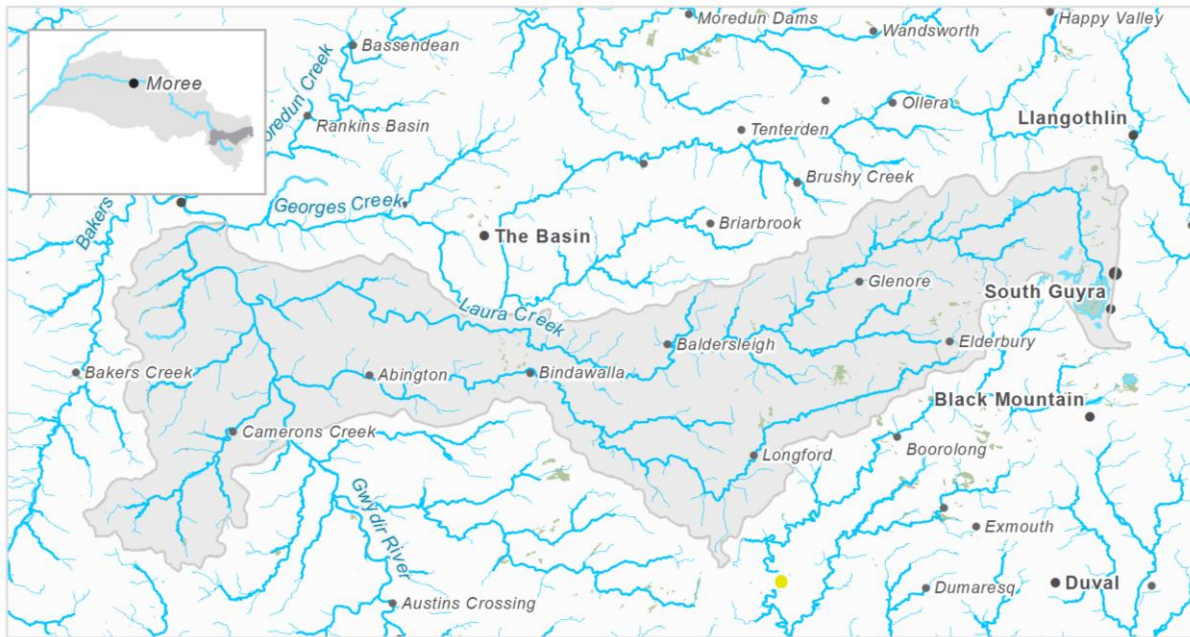
A small number of small licences are distributed along Boorolong Creek. This planning unit has very low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	L <sup>0</sup>	M <sup>-</sup>	L <sup>-</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

### Recommendations

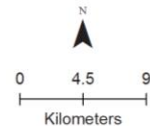
- Investigate opportunities to reduce impact on baseflows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.

## 1.24 Laura Creek water source



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks
- Water-dependent sites
- Water-dependent vegetation
- Laura Creek Water Source



### Priority environmental assets

Laura Creek and its associated inchannel habitat and fringing vegetation communities

New England Wetlands

Mother of Ducks Lagoon

<b>Native fish</b>	<ul style="list-style-type: none"> <li>• freshwater catfish</li> <li>• Australian smelt</li> <li>• golden perch</li> </ul>	<ul style="list-style-type: none"> <li>• Darling river hardyhead</li> <li>• river blackfish</li> <li>• mountain galaxias</li> </ul>	<ul style="list-style-type: none"> <li>• carp gudgeon</li> <li>• purple spotted gudgeon</li> <li>• Murray cod</li> </ul>
<b>Birds</b>	<p>85 water-dependent bird species recorded, including</p> <ul style="list-style-type: none"> <li>• curlew sandpiper</li> <li>• Australian painted snipe</li> <li>• brolga</li> <li>• Latham's snipe</li> <li>• blue-billed duck</li> <li>• gull-billed tern</li> <li>• white-winged black tern</li> <li>• sharp-tailed sandpiper</li> <li>• red-necked phalarope</li> <li>• cattle egret</li> <li>• eastern great egret</li> <li>• marsh sandpiper</li> <li>• Pacific golden plover</li> <li>• comb-crested jacana</li> </ul>		
<b>Native vegetation</b>	<p>Seven water-dependent PCTs, including:</p> <ul style="list-style-type: none"> <li>• river red gum woodlands</li> <li>• heath swamps</li> <li>• montane bogs</li> <li>• sedgeland-forbland wetlands</li> <li>• sedgeland fens wetlands</li> <li>• upland wetlands</li> </ul>		
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>• Aboriginal ceremony and dreaming sites</li> </ul>		

## Hydrology

Gauge – Laura Creek (418021)	80 <sup>th</sup> percentile – 0.1ML/day	50 <sup>th</sup> percentile – 9ML/day	20 <sup>th</sup> percentile – 63.1ML/day
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Flows do not seem to be altered by more than 20% compared to the 'without development' model scenario as assessed by the *Gwydir WSPA* Risk Assessment.

A small number of small licences are distributed along Laura Creek. This planning unit has very low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows could be substantially impacted by extraction.

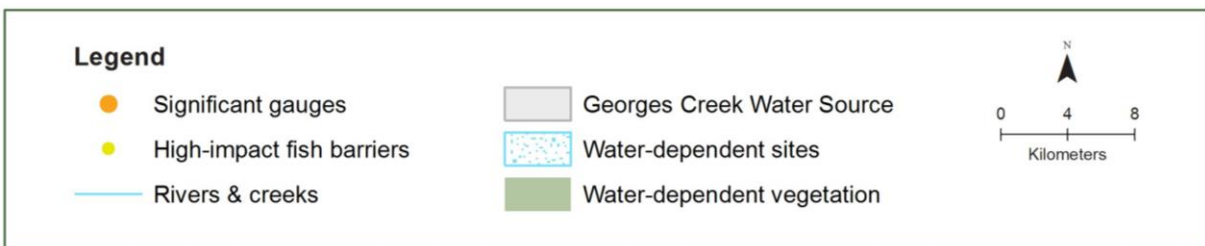
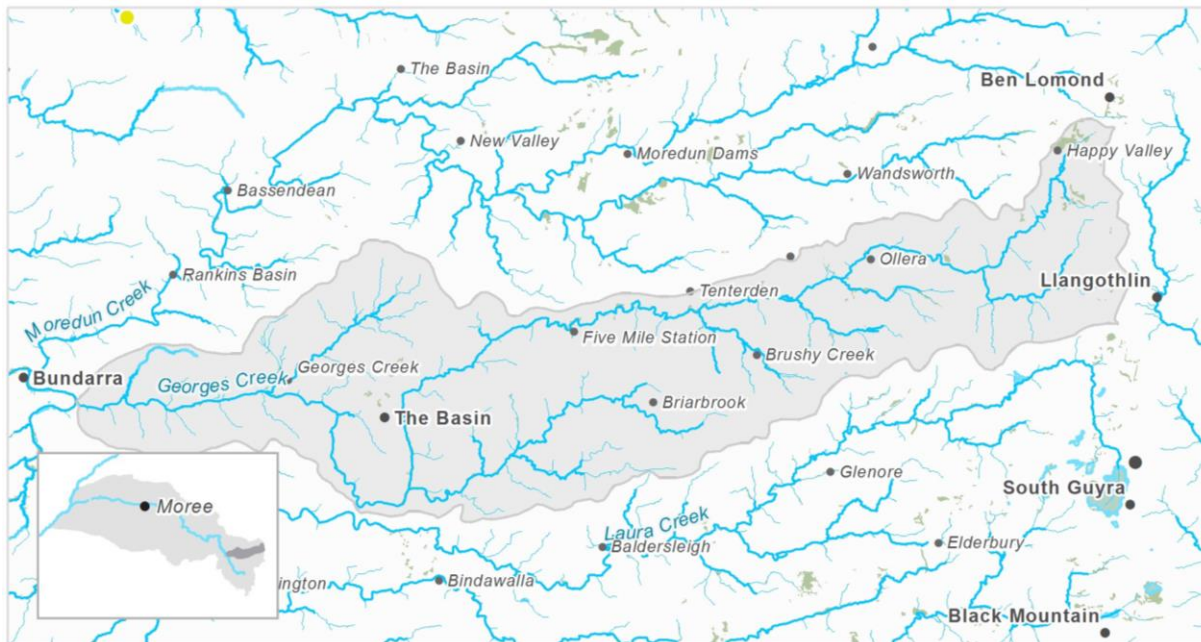
	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	L <sup>0</sup>	L <sup>-</sup>	L <sup>-</sup>	L <sup>-</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

## Recommendations

- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.



## 1.25 Georges Creek water source



### Priority environmental assets

Winter Station Creek

Georges Creek and its associated inchannel habitat and fringing vegetation communities

<b>Native fish</b>	<ul style="list-style-type: none"> <li>Purple-spotted gudgeon</li> <li>freshwater catfish</li> </ul>
<b>Birds</b>	28 water-dependent bird species recorded
<b>Native vegetation</b>	Five water-dependent PCTs, including <ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>sedgeland fens wetlands</li> <li>heath swamps</li> <li>upland wetlands</li> </ul>

**Registered cultural assets**  
None registered

### Hydrology

Gauge – Georges Creek (418022)	80 <sup>th</sup> percentile – 0.1ML/day	50 <sup>th</sup> percentile – 8.8ML/day	20 <sup>th</sup> percentile – 91.4ML/day
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Cease-to-flow periods are highly altered, as assessed by the *Gwydir WSPA Risk Assessment*. Cease-to-flows currently occur more frequently compared to the 'without development' model scenario.

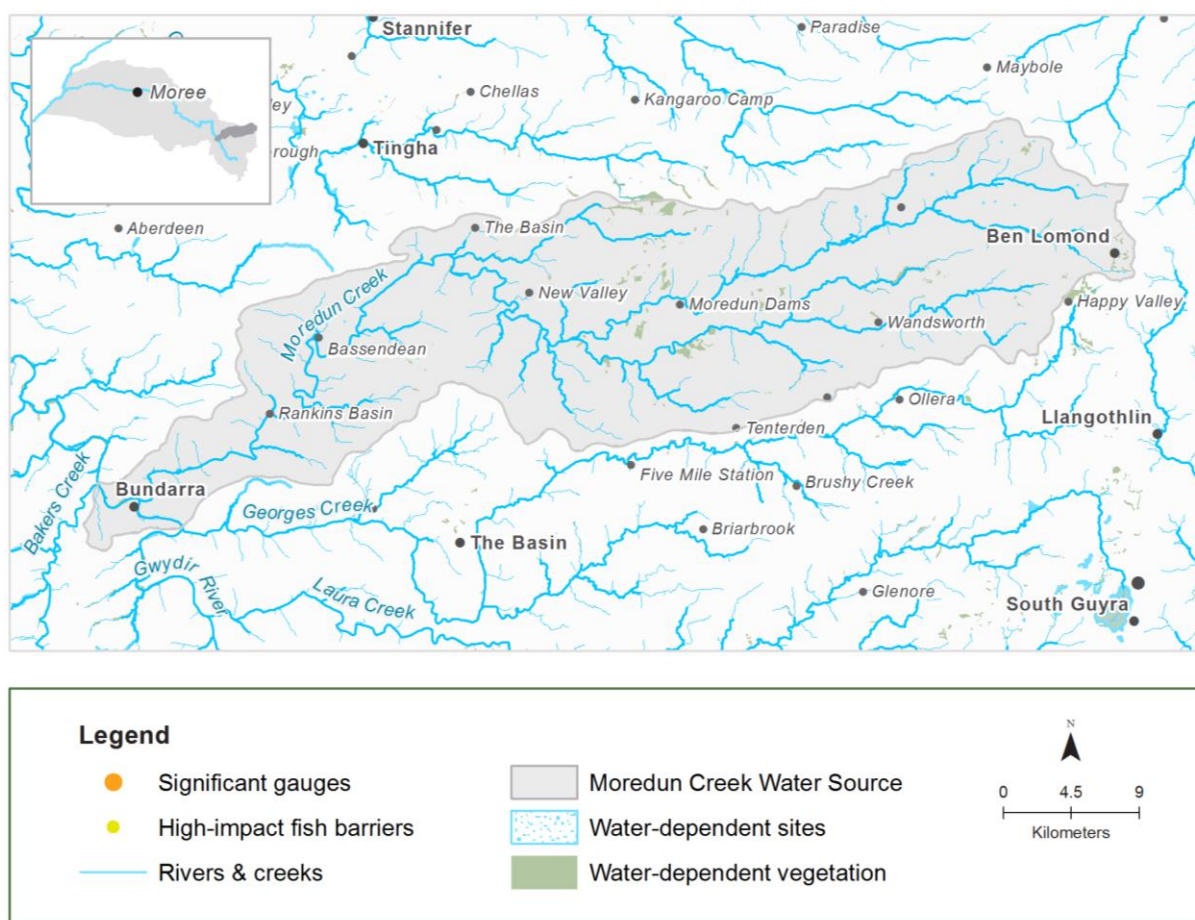
A small number of small licences are distributed along Georges Creek. This planning unit has very low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	L <sup>-</sup>	L <sup>-</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			
Recommendations				

- Investigate opportunities to reduce length of cease-to-flow periods in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect against extended cease-to-flow periods, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.



## 1.26 Moredun Creek water source



### Priority environmental assets

Moredun Creek and its associated inchannel habitat and fringing vegetation communities

<b>Native fish</b>	<ul style="list-style-type: none"> <li>Australian smelt</li> <li>mountain galaxias</li> <li>river blackfish</li> <li>golden perch</li> <li>carp–gudgeon</li> <li>Murray cod</li> <li>freshwater catfish</li> <li>Darling river hardyhead</li> <li>purple spotted gudgeon</li> </ul>
<b>Birds</b>	47 water-dependent bird species recorded, including blue-billed duck, Latham's snipe & eastern great egret
<b>Native vegetation</b>	<p>Seven water-dependent PCTs, including</p> <ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>sedgeland–forbland wetlands</li> <li>sedgeland fens wetlands</li> <li>upland wetlands</li> <li>heath swamps</li> </ul>
<b>Registered cultural assets</b>	None registered

### Hydrology

Gauge – Moredun Creek (418023)	80 <sup>th</sup> percentile – 3.2ML/day	50 <sup>th</sup> percentile – 26ML/day	20 <sup>th</sup> percentile – 153.1ML/day
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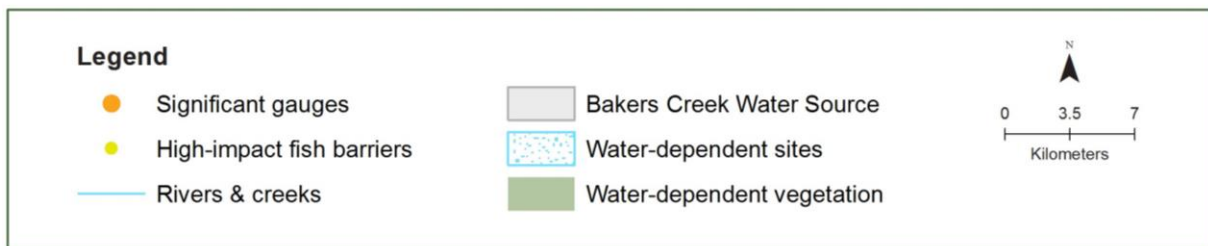
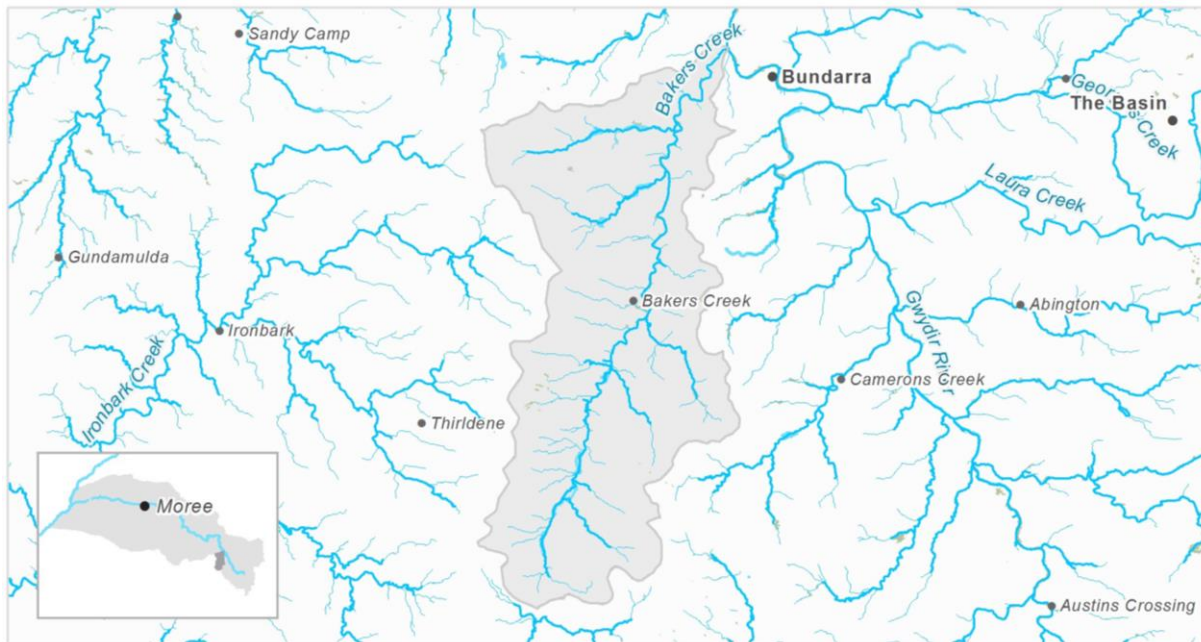
Cease-to-flow periods and low flows are highly altered, as assessed by the *Gwydir WSPA Risk Assessment*. Cease-to-flow periods currently occur more frequently and low flows occur less frequently compared to the 'without development' model scenario.

Several small licences are distributed along Moredun Creek. Water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	H <sup>-</sup>	L <sup>0</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			
Recommendations				

- Investigate opportunities to reduce length of cease-to-flow periods in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes

## 1.27 Bakers Creek water source



### Priority environmental assets

Bakers Creek and its associated inchannel habitat and fringing vegetation communities

**Native fish** • purple-spotted gudgeon • freshwater catfish

**Birds** 20 water-dependent birds recorded

**Native vegetation** Five water-dependent PCTs, including river red gum woodlands, montane bogs & sedgeland fens wetlands

**Registered cultural assets** None registered

### Hydrology

Gauge – Bakers Creek at Bundarra (418033)	80 <sup>th</sup> percentile – 1.1ML/day	50 <sup>th</sup> percentile – 6.5ML/day	20 <sup>th</sup> percentile – 32.7ML/day
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Cease-to-flow periods are highly altered, as assessed by the *Gwydir WRP* Risk Assessment. They currently occur more frequently compared to the 'without development' model scenario.

A small number of small licences are distributed along Bakers Creek. This planning unit has very low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

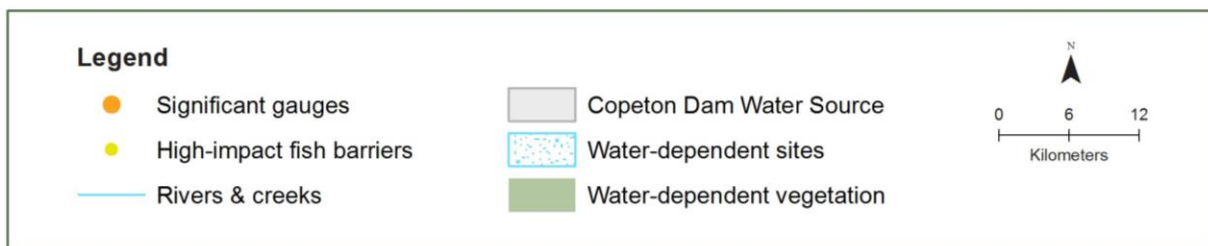
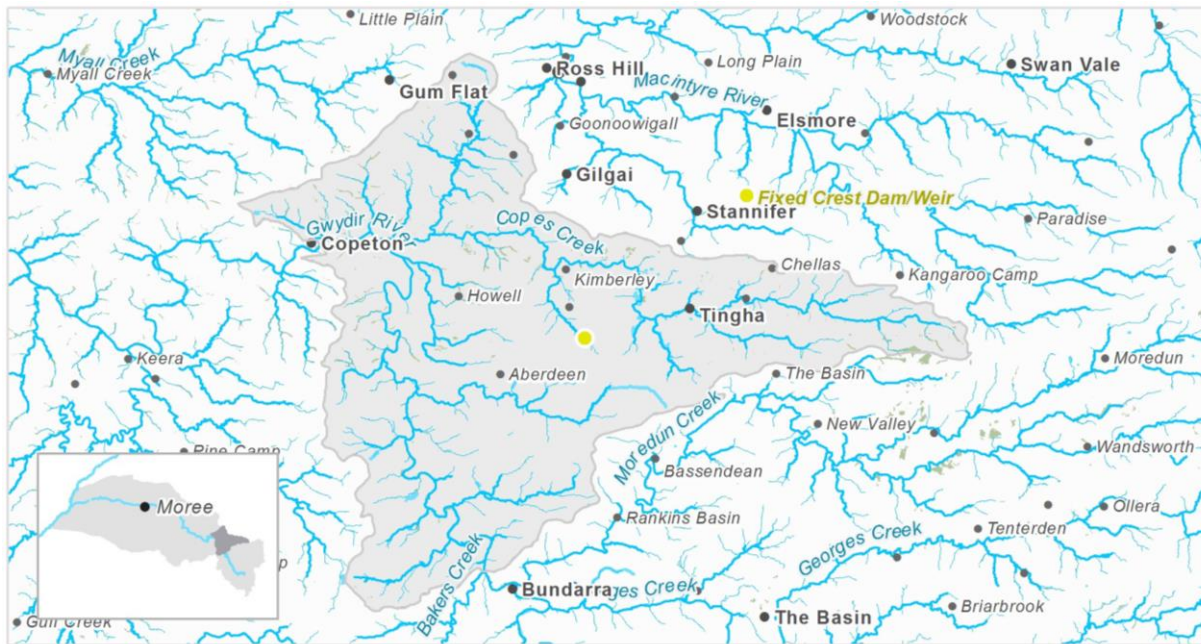
	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	L <sup>-</sup>	L <sup>-</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

### Recommendations

- Investigate opportunities to reduce length of cease-to-flow periods in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.



## 1.28 Copeton Dam water source



### Priority environmental assets

#### Murray Waters

Copes Creek and its associated inchannel habitat and fringing vegetation communities

<b>Native fish</b>	<ul style="list-style-type: none"> <li>Australian smelt</li> <li>carp–gudgeon</li> <li>golden perch</li> <li>Darling river hardyhead</li> <li>freshwater catfish</li> <li>Murray cod</li> <li>purple spotted gudgeon</li> </ul>
<b>Birds</b>	53 water-dependent bird species recorded, including the eastern great egret
<b>Native vegetation</b>	<p>Nine water-dependent PCTs, including</p> <ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>montane bogs</li> <li>sedgeland–forbland wetlands</li> <li>sedgeland fens wetlands</li> </ul>
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Modified trees</li> </ul>

### Hydrology

Gauge – Copes Creek (418005)

80<sup>th</sup> percentile – 0.4ML/day

50<sup>th</sup> percentile – 3.1ML/day

20<sup>th</sup> percentile – 16.2ML/day

Cease-to-flow periods and low flows are highly altered, and freshes are moderately altered as assessed by the *Gwydir WRPA Risk Assessment*. Cease-to-flow periods currently occur more frequently, and low flows and freshes occur less frequently compared to the 'without development' model scenario.

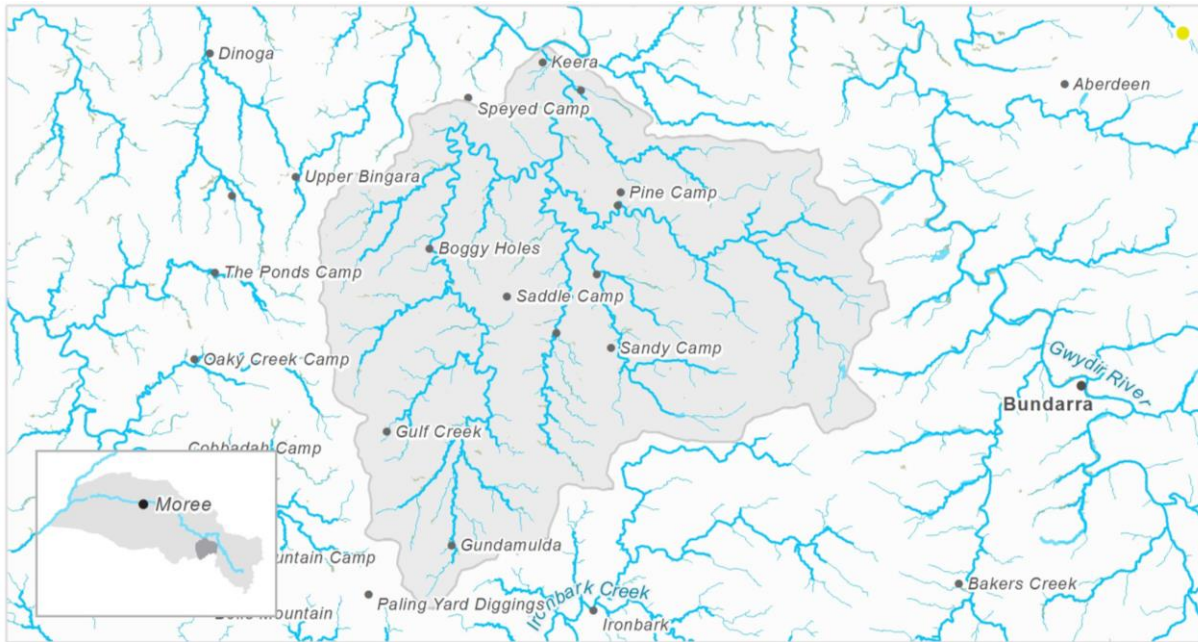
A small number of small licences are distributed within Copeton Dam water source. Water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	H <sup>-</sup>	M <sup>-</sup>	L <sup>-</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			
Recommendations				

- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on baseflows and freshes in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
  - Consider protecting freshes at ecologically relevant times to support native fish species movement, distribution and condition
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.

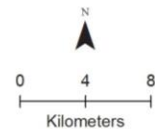


## 1.29 Keera Creek water source



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks
- Keera Creek Water Source
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

Keera Creek and its associated inchannel habitat and fringing vegetation communities

Tributaries to Keera Creek

<b>Native fish</b>	<ul style="list-style-type: none"> <li>purple-spotted gudgeon</li> <li>freshwater catfish</li> <li>unspecked hardyhead</li> <li>carp gudgeon</li> </ul>	<ul style="list-style-type: none"> <li>spangled perch</li> <li>golden perch</li> <li>Murray–Darling rainbowfish</li> </ul>	<ul style="list-style-type: none"> <li>bony herring</li> <li>Darling river hardyhead</li> <li>Australian smelt</li> </ul>

**Birds** 51 water-dependent bird species recorded, including the endangered Australian painted snipe

**Native vegetation** Seven water-dependent PCTs, including river red gum forests & woodlands, & sedgeland fens wetlands

**Registered cultural assets**

- Burial sites

### Hydrology

Gauge – Keera Creek (418018)	80 <sup>th</sup> percentile – 1.4 ML/day	50 <sup>th</sup> percentile – 10.7 ML/day	20 <sup>th</sup> percentile – 59.5 ML/day
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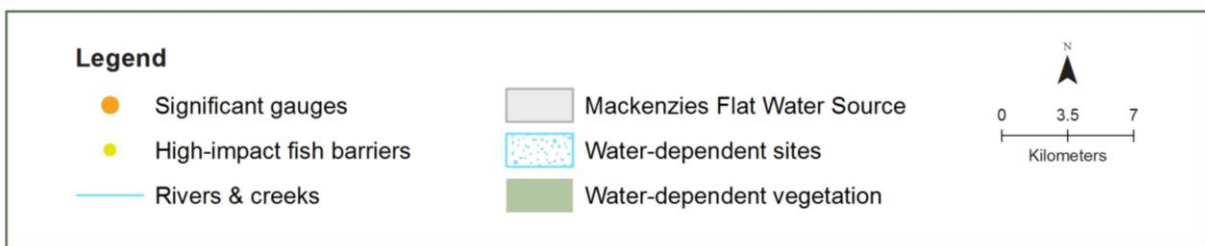
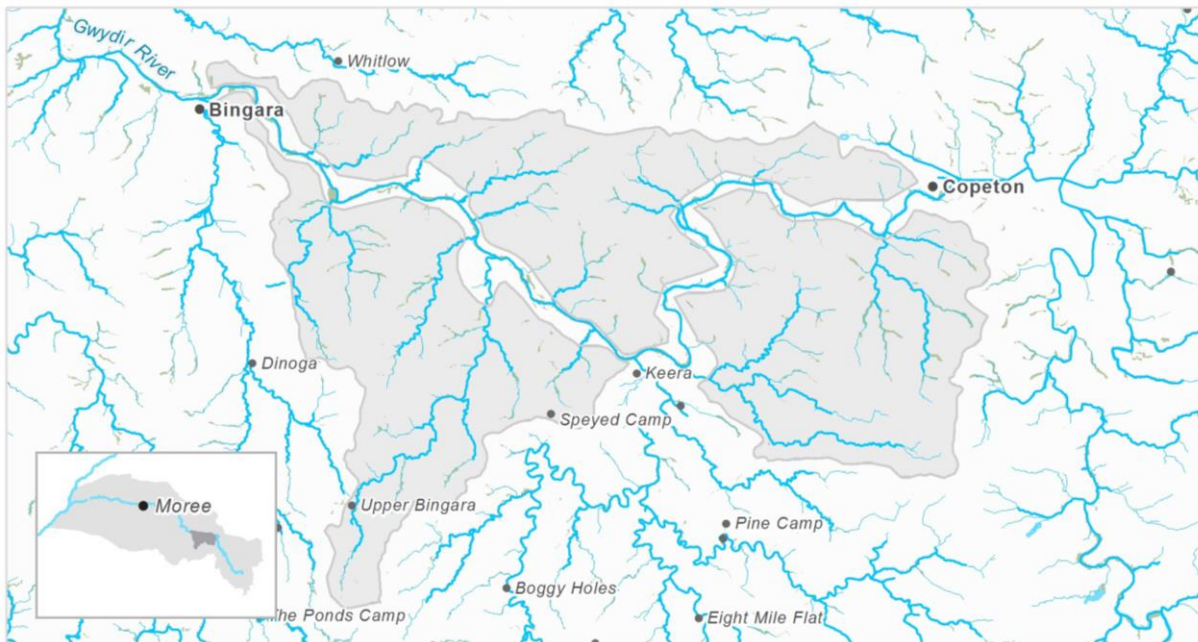
Cease-to-flow periods and low flows are highly altered, as assessed by the *Gwydir WRPA Risk Assessment*. Cease-to-flows currently occur more frequently and low flows occur less frequently compared to the ‘without development’ model scenario.

A small number of small licences are distributed along Keera Creek. This planning unit has very low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	H <sup>-</sup>	L <sup>-</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			
Recommendations				

- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on baseflows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.

## 1.30 Mackenzies Flat water source



### Priority environmental assets

Tributaries to the Gwydir River and its associated inchannel habitat and fringing vegetation communities

**Native fish**

- purple-spotted gudgeon
- darling river hardyhead
- unspecked hardyhead
- carp gudgeon

**Birds** 40 water-dependent bird species recorded, including the eastern great egret

**Native vegetation** Eight water-dependent PCTs, including river red gum woodlands & sedgeland fens wetlands

**Registered cultural assets** None registered

### Hydrology

No gauge – Halls Creek at Bingara (418025)	80 <sup>th</sup> percentile – 2.4ML/day	50 <sup>th</sup> percentile – 4.3ML/day	20 <sup>th</sup> percentile – 8.7ML/day
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Flows do not seem to be altered by more than 20% compared to the 'without development' model scenario as assessed by the *Gwydir WSPA Risk Assessment*.

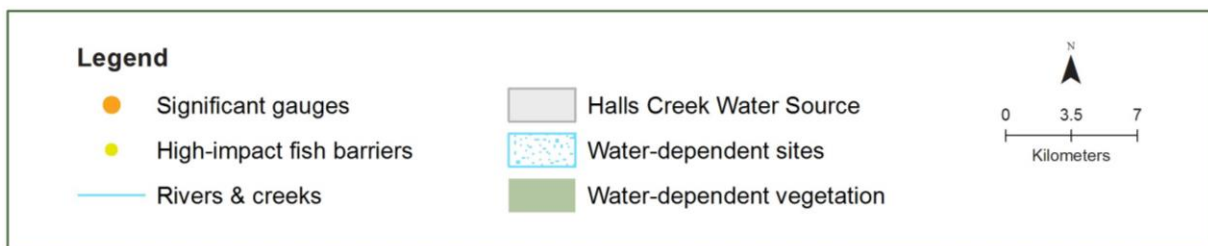
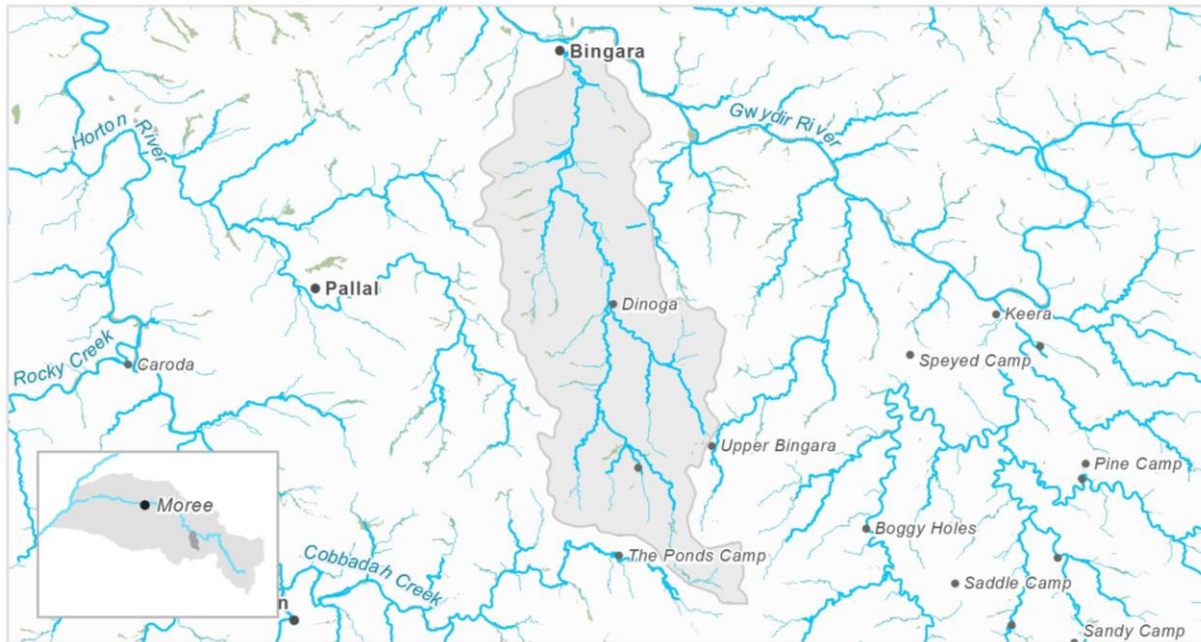
Only one small licence exists in the Mackenzies Flat planning unit, which likely minimally impacts flows.

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	L <sup>0</sup>	L <sup>0</sup>	L <sup>0</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

### Recommendations

- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.

## 1.31 Halls Creek water source



### Priority environmental assets

Halls Creek and its associated inchannel habitat and fringing vegetation communities

**Native fish**

- freshwater catfish
- purple-spotted gudgeon
- Darling river hardyhead
- carp gudgeon

**Birds** 59 water-dependent bird species recorded, including

- Australasian bittern
- eastern great egret
- Latham's snipe

**Native vegetation** Six water-dependent PCTs, including river red gum woodlands

**Registered cultural assets** None registered

### Hydrology

Gauge – Halls Creek at Bingara (418025)	80 <sup>th</sup> percentile – 4ML/day	50 <sup>th</sup> percentile – 7.3ML/day	20 <sup>th</sup> percentile – 14.8ML/day
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Cease-to-flow periods are highly altered and low flows are moderately altered, as assessed by the *Gwydir WSPA Risk Assessment*. Cease-to-flows currently occur more frequently and low flows occur less frequently compared to the 'without development' model scenario.

A small number of small licences are distributed along Halls Creek. This planning unit has very low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

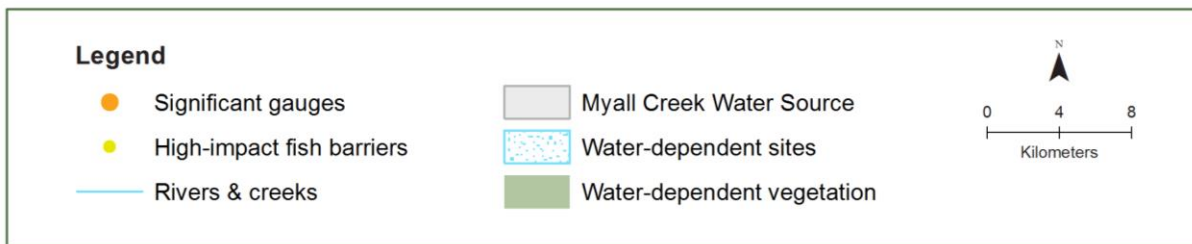
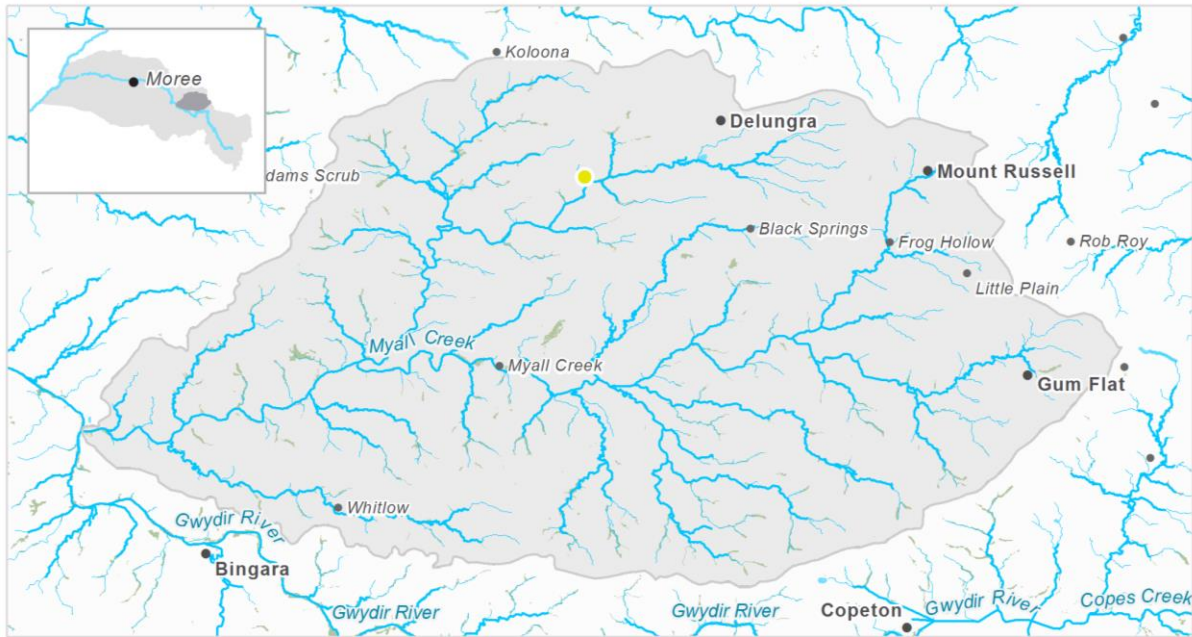


	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	M <sup>-</sup>	L <sup>-</sup>	L <sup>0</sup>
Relevant rules	Trade not permitted into the water source			
	<b>Halls Creek Tributaries MZ</b> Cease to pump when there is no visible flow		<b>Halls Creek MZ</b> Cease to pump when there is no visible flow at Halls Creek at Bingara gauge (418025)	
Recommendations				

- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on baseflows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.



## 1.32 Myall Creek water source



### Priority environmental assets

Areas of high biodiversity

Myall Creek and its associated inchannel habitat and fringing vegetation communities

Lowland Darling River endangered ecological community

Tributaries to Myall Creek

<b>Native fish</b>	<ul style="list-style-type: none"> <li>Australian smelt</li> <li>Darling river hardyhead</li> <li>carp–gudgeon</li> <li>purple-spotted gudgeon</li> </ul>	<ul style="list-style-type: none"> <li>freshwater catfish</li> <li>spangled perch</li> <li>golden perch</li> </ul>	<ul style="list-style-type: none"> <li>Murray cod</li> <li>Unspecked hardyhead</li> <li>bony herring</li> </ul>

**Birds** 47 water-dependent bird species recorded, including the eastern great egret

**Native vegetation** Nine water-dependent PCTs, including river red gum woodlands & sedgeland fens wetlands

**Registered cultural assets** None registered

### Hydrology

Gauge – Myall Creek (418017)	80 <sup>th</sup> percentile – 1.9ML/day	50 <sup>th</sup> percentile – 10.4ML/day	20 <sup>th</sup> percentile – 39.1ML/day
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Cease-to-flow periods and low flows are highly altered as assessed by the *Gwydir WRP* Risk Assessment. Cease-to-flow periods currently occur more frequently and low flows occur less frequently compared to the 'without development' model scenario.

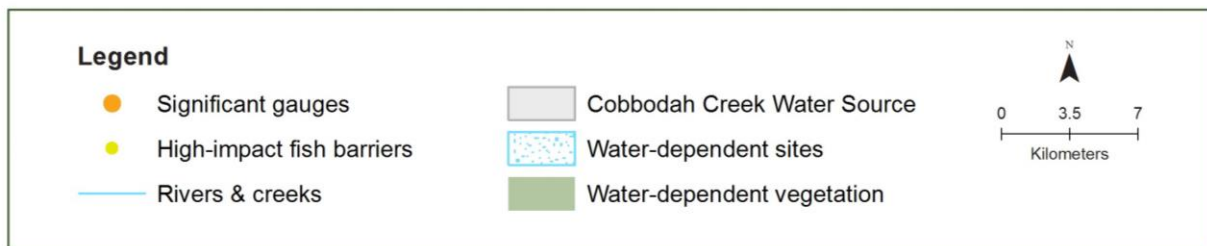
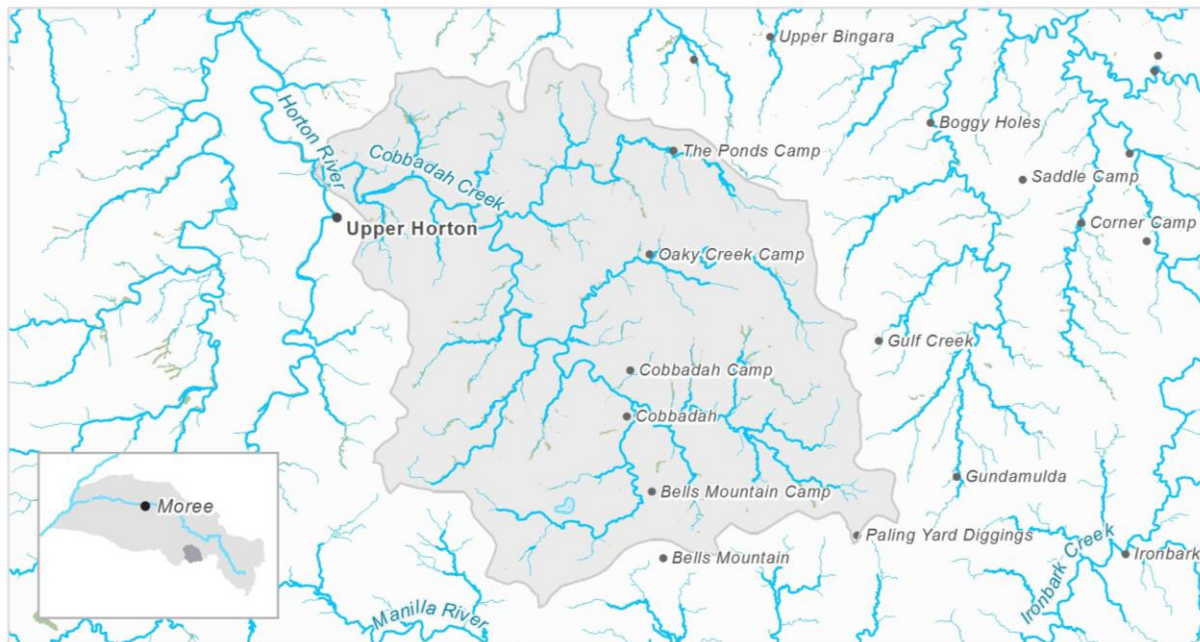
Several small licences are distributed along Myall Creek. This planning unit is characterised by very low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	H <sup>-</sup>	L <sup>-</sup>	L <sup>-</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

### Recommendations

- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on baseflows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.

## 1.33 Cobbadah Creek water source



### Priority environmental assets

#### Chain of Ponds Creek

#### Cobbadah Creek and its associated inchannel habitat and fringing vegetation communities

<b>Native fish</b>	<ul style="list-style-type: none"> <li>Australian smelt</li> <li>carp–gudgeon</li> <li>spangled Perch</li> </ul>	<ul style="list-style-type: none"> <li>freshwater Catfish</li> <li>Murray cod</li> </ul>	<ul style="list-style-type: none"> <li>Darling river hardyhead</li> <li>purple-spotted gudgeon</li> </ul>
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<b>Birds</b>	48 water-dependent bird species recorded, including the eastern great egret
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<b>Native vegetation</b>	Seven water-dependent PCTs, including river red gum woodlands
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<b>Registered cultural assets</b>	None registered
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### Hydrology

No gauge – Horton River at Horton Dam (418027)	80 <sup>th</sup> percentile – 1.1ML/day	50 <sup>th</sup> percentile – 8.5ML/day	20 <sup>th</sup> percentile – 47.4ML/day
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Cease-to-flow periods and baseflows are highly altered, as assessed by the *Gwydir WRPA Risk Assessment*. Cease-to-flows currently occur more frequently and baseflows occur less frequently compared to the 'without development' model scenario.

A small number of small licences are distributed along Cobbodah Creek. This planning unit has very low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment). Cobbodah Creek is a priority planning unit to investigate since low flows are highly impacted and there is potential to achieve significant environmental benefits with improved protection of critical flows.

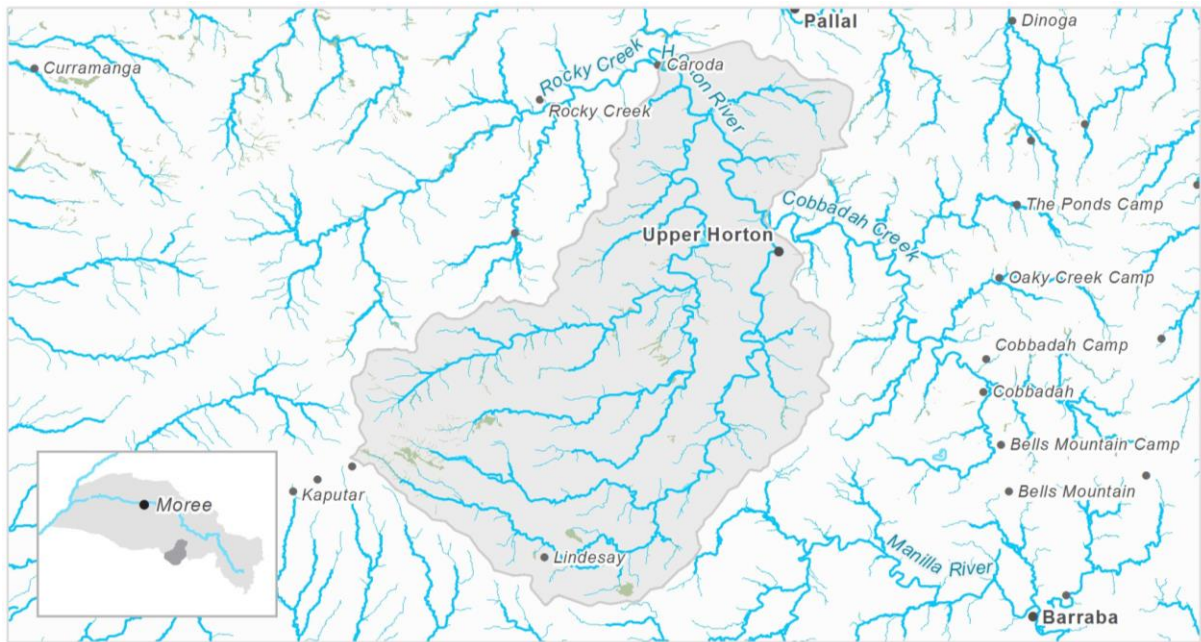
	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	H <sup>-</sup>	L <sup>-</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

### Recommendations

- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on baseflows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.



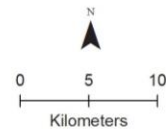
## 1.34 Upper Horton water source



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks

- Upper Horton Water Source
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

Horton River and its associated inchannel habitat and fringing vegetation communities

<b>Native fish</b>	<ul style="list-style-type: none"> <li>• Australian smelt</li> <li>• unspotted hardyhead</li> <li>• Murray–Darling rainbowfish</li> </ul> <ul style="list-style-type: none"> <li>• spangled perch</li> <li>• golden perch</li> <li>• Carp–gudgeon</li> </ul> <ul style="list-style-type: none"> <li>• Murray cod</li> <li>• freshwater catfish</li> <li>• purple spotted gudgeon</li> </ul>
--------------------	---

<b>Birds</b>	52 water-dependent bird species recorded, including
	<ul style="list-style-type: none"> <li>• Latham's snipe</li> </ul> <ul style="list-style-type: none"> <li>• eastern great egret</li> </ul>

<b>Native vegetation</b>	Eight water-dependent PCTs, including river red gum woodlands & sedgeland fens wetlands
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<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>• Modified trees</li> </ul>
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### Hydrology

Gauge – Horton River at Horton Dam (418027)	80 <sup>th</sup> percentile – 8.5ML/day	50 <sup>th</sup> percentile – 39.3ML/day	20 <sup>th</sup> percentile – 180ML/day
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Cease-to-flow periods and low flows are highly altered as assessed by the *Gwydir WRPA Risk Assessment*. Cease-to-flows currently occur more frequently and low flows occur less frequently compared to the 'without development' model scenario.

A small number of small licences are distributed along the Upper Horton River. Water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

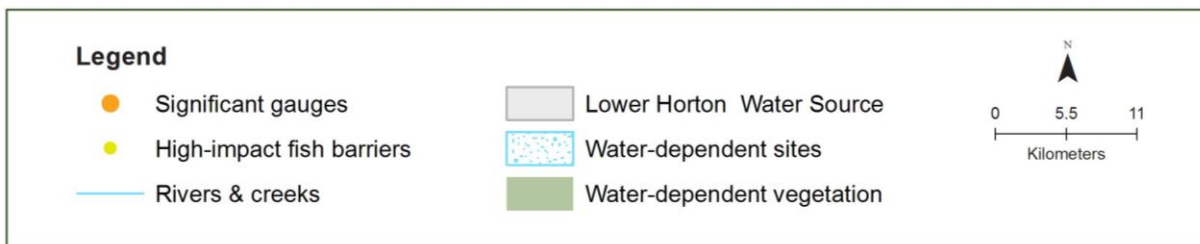
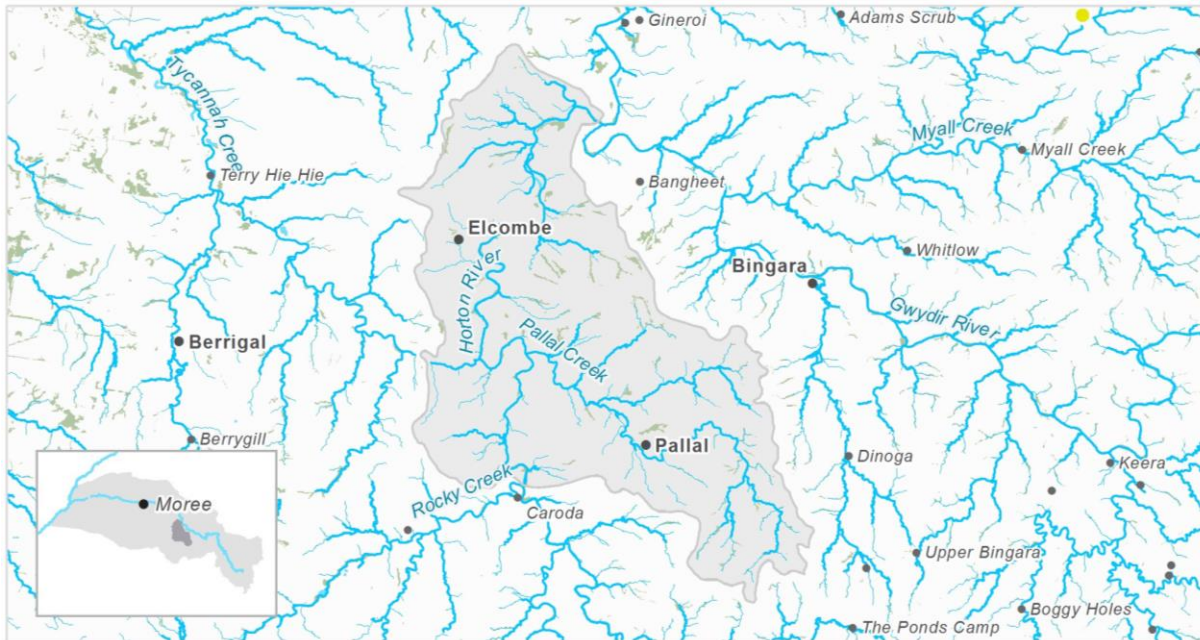
	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	H <sup>-</sup>	L <sup>-</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

### Recommendations

- Investigate opportunities to reduce length of cease-to-flow periods in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.



## 1.35 Lower Horton water source



### Priority environmental assets

Areas of Lowland Darling River endangered ecological community

Horton River and its associated inchannel habitat and fringing vegetation communities

<b>Native fish</b>	<ul style="list-style-type: none"> <li>Australian smelt</li> <li>carp–gudgeon</li> <li>Murray–Darling rainbowfish</li> <li>unspotted hardyhead</li> </ul>	<ul style="list-style-type: none"> <li>Murray cod</li> <li>golden perch</li> <li>spangled perch</li> </ul>	<ul style="list-style-type: none"> <li>bony herring</li> <li>freshwater catfish</li> <li>purple spotted gudgeon</li> </ul>
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64 water-dependent bird species recorded including

<b>Birds</b>	<ul style="list-style-type: none"> <li>common greenshank</li> <li>Latham's snipe</li> </ul>	<ul style="list-style-type: none"> <li>comb-crested jacana</li> </ul>	<ul style="list-style-type: none"> <li>brilga</li> </ul>
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<b>Native vegetation</b>	Eight water-dependent PCTs, including river red gum woodlands
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<b>Registered cultural assets</b>	None registered
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### Hydrology

Gauge – Horton River at Rider Gauge (418015)	80 <sup>th</sup> percentile – 18.5ML/day	50 <sup>th</sup> percentile – 66.4ML/day	20 <sup>th</sup> percentile – 252.9ML/day
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The Horton River is one of the main unregulated tributaries of the Gwydir River. The confluence of the Horton and Gwydir Rivers is approximately 15km downstream of Bingara. Low flows are highly altered, as assessed by the *Gwydir WRP* Risk Assessment. Low flows occur less frequently compared to the 'without development' model scenario.

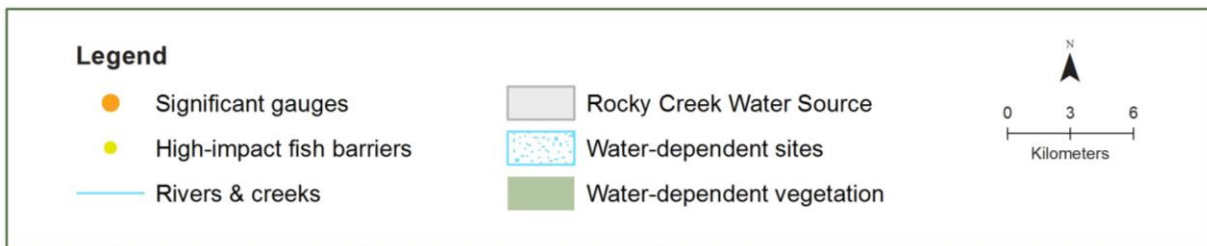
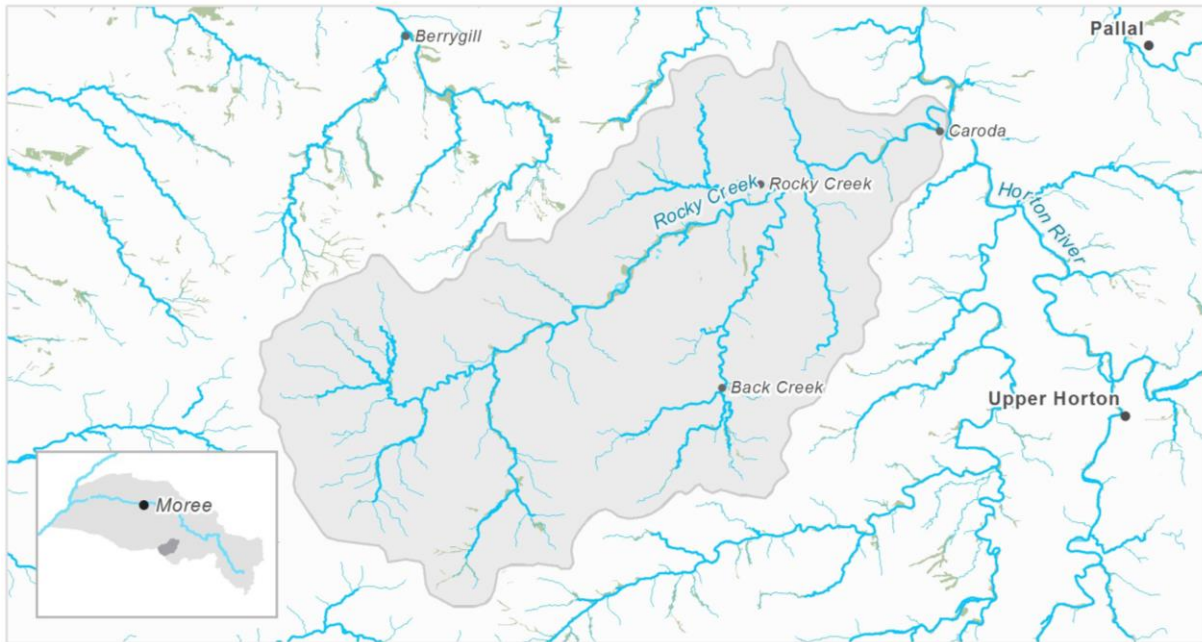
Several small and medium licences are distributed along the Lower Horton. This planning unit has very low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	L <sup>0</sup>	H <sup>-</sup>	L <sup>-</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Cease to pump at 4ML/day at Horton River at Rider Gauge (418015) Trade not permitted into the water source			

### Recommendations

- Investigate opportunities to reduce extraction pressure on low flows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider replacing perennial cease-to-pump rules with rostering low flow water access.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
    - Cease-to-pump at 10 ML/day at Horton River at Rider Gauge (418015)
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.

## 1.36 Rocky Creek water source



### Priority environmental assets

Tycannah Creek and its associated inchannel habitat and fringing vegetation communities

<b>Native fish</b>	• unspecked hardyhead	• spangled perch	• carp–gudgeon
	• Murray–Darling rainbowfish	• Murray cod	• freshwater catfish
	• Purple-spotted gudgeon	• Australian smelt	• Darling river hardyhead

**Birds** 34 water-dependent bird species recorded

**Native vegetation** Six water-dependent PCTs, including river red gum woodlands

**Registered cultural assets** None registered

### Hydrology

No gauge – Horton River at Horton Dam (418027)	80 <sup>th</sup> percentile – 0.5ML/day	50 <sup>th</sup> percentile – 9.6ML/day	20 <sup>th</sup> percentile – 75.9ML/day
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Cease-to-flow periods and low flows are highly altered as assessed by the *Gwydir WRPA Risk Assessment*. Cease-to-flow periods currently occur more frequently and low flows occur less frequently compared to the 'without development' model scenario.

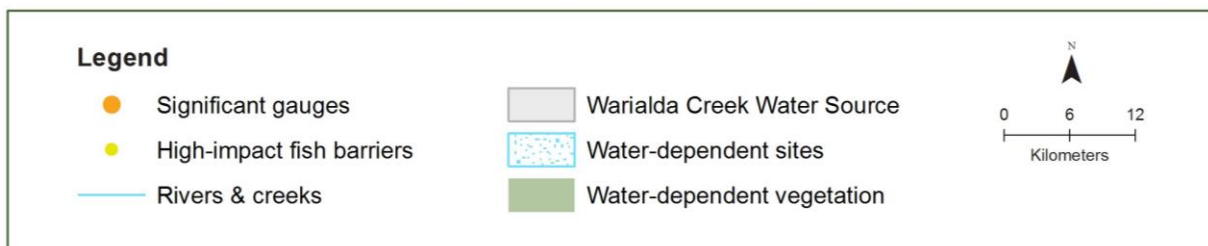
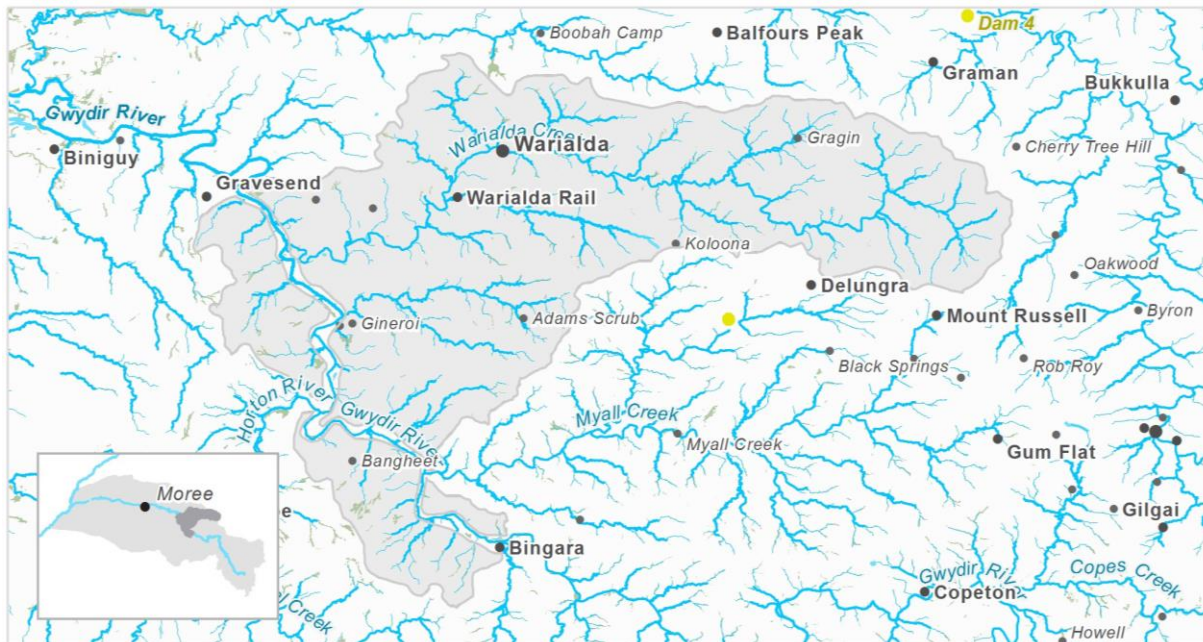
Several small licences are distributed along Rocky Creek. This planning unit is characterised by very low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	H <sup>-</sup>	L <sup>-</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			
Recommendations				

- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on baseflows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.



## 1.37 Warialda Creek water source



### Priority environmental assets

Warialda Creek and its associated inchannel habitat and fringing vegetation communities

Tributaries to Warialda Creek

Native fish	<ul style="list-style-type: none"> <li>Australian smelt</li> <li>unspecked hardyhead</li> <li>purple-spotted gudgeon</li> <li>spangled perch</li> </ul>		
	<ul style="list-style-type: none"> <li>golden perch</li> <li>bony herring</li> <li>carp–gudgeon</li> </ul>	<ul style="list-style-type: none"> <li>Murray cod</li> <li>freshwater catfish</li> <li>Darling river hardyhead</li> </ul>	

**Birds** 69 water-dependent bird species recorded, including the eastern great egret

**Native vegetation** 12 water-dependent PCTs, including

- river red gum woodlands
- river coobah wetlands
- sedgeland fens wetlands

**Registered cultural assets** None registered

### Hydrology

Gauge – Warialda Creek at Bundarra (418016)	80 <sup>th</sup> percentile – 0.3ML/day	50 <sup>th</sup> percentile – 3.2ML/day	20 <sup>th</sup> percentile – 18.8ML/day
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Cease-to-flow periods are highly altered and low flows are moderately altered, as assessed by the *Gwydir WRPA Risk Assessment*. Cease-to-flows currently occur more frequently and low flows occur less frequently compared to the 'without development' model scenario.

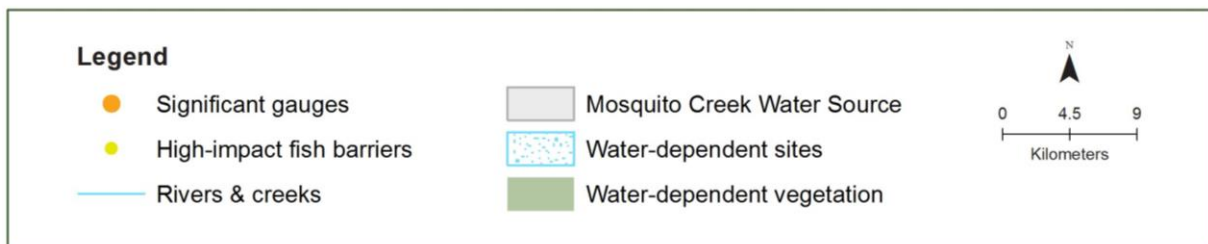
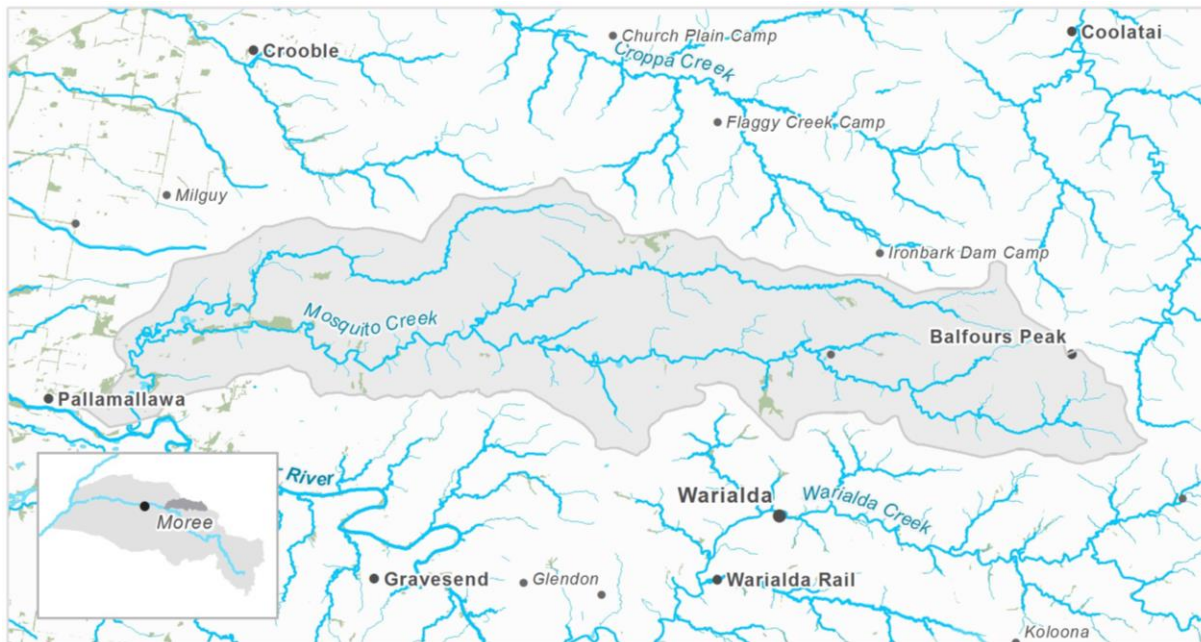
A small number of small licences are distributed along Warialda Creek. Water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment).

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	M <sup>-</sup>	L <sup>-</sup>	L <sup>-</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			
Recommendations				

- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on low flows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.



## 1.38 Mosquito Creek water source



### Priority environmental assets

No priority environmental assets in this planning unit  
Important environmental assets listed below

<b>Native fish</b>	<ul style="list-style-type: none"> <li>purple-spotted gudgeon</li> <li>freshwater catfish</li> </ul>
<b>Birds</b>	39 water-dependent bird species recorded
<b>Native vegetation</b>	14 water-dependent PCTs, including: <ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>coolibah woodlands and coolibah wetland woodlands</li> <li>water couch marsh grasslands</li> </ul>
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Modified trees</li> </ul>

### Hydrology

Gauge – N/A	80 <sup>th</sup> percentile	50 <sup>th</sup> percentile	20 <sup>th</sup> percentile
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Low flows are moderately altered as assessed by the *Gwydir WRP* Risk Assessment. Low flows and freshes occur less frequently compared to the 'without development' model scenario.

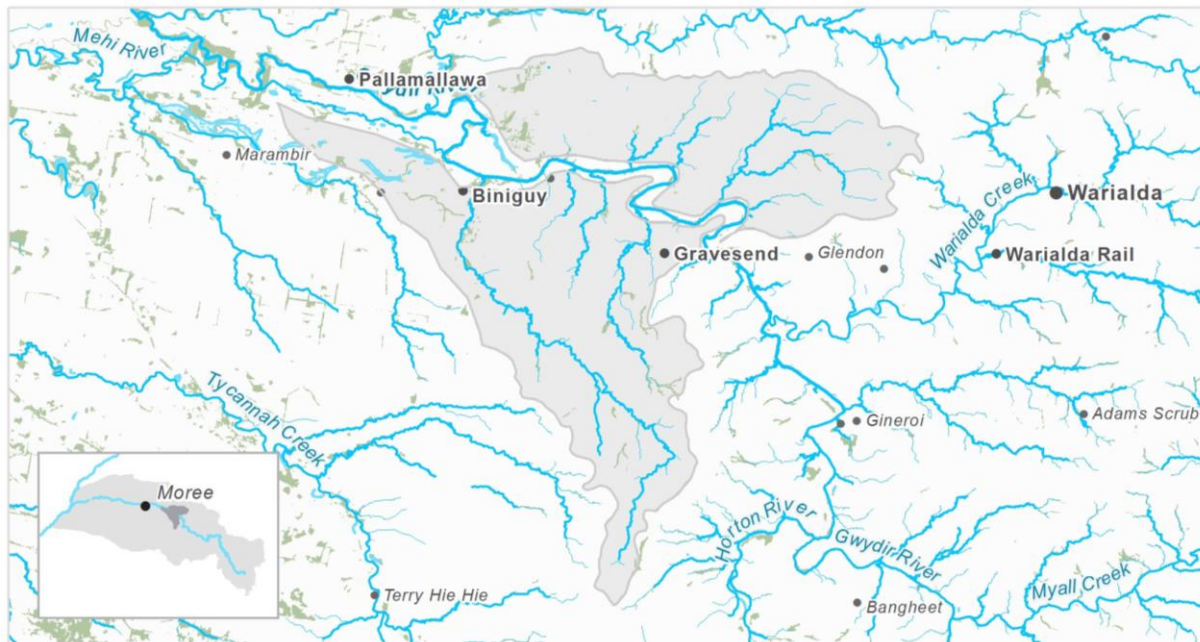
No licences exist in Mosquito Creek.

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	L <sup>0</sup>	M <sup>-</sup>	L <sup>-</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			
Recommendations				

- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.

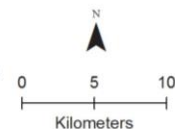
## 1.39 Slaughterhouse Creek water source



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks

- Slaughterhouse Creek Water Source
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

No priority environmental assets in this planning unit

Important environmental assets listed below

<b>Native fish</b>	<ul style="list-style-type: none"> <li>purple-spotted gudgeon</li> <li>freshwater catfish</li> </ul>		
<b>Birds</b>	50 water-dependent bird species recorded, including the eastern great egret  16 water-dependent PCTs, including		
<b>Native vegetation</b>	<ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>common reed grasslands</li> </ul>	<ul style="list-style-type: none"> <li>coolibah woodlands and coolibah wetland woodlands</li> <li>shallow freshwater wetland sedgeland</li> </ul>	<ul style="list-style-type: none"> <li>tall rushlands, reedlands and sedgeland</li> </ul>
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Modified trees</li> </ul>		

### Hydrology

No gauge – Tycannah Creek at Horseshoe Lagoon (418032)	80 <sup>th</sup> percentile – 0ML/day	50 <sup>th</sup> percentile – 0.3ML/day	20 <sup>th</sup> percentile – 1.7ML/day
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Flows do not seem to be altered by more than 20% as assessed by the *Gwydir WRP* Risk Assessment.

There are no extraction licences in this planning unit.

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	L <sup>0</sup>	L <sup>0</sup>	L <sup>0</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			
Recommendations				

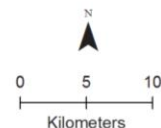
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.

## 1.40 Moree water source



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks
- Moree Water Source
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

Inchannel habitat and fringing vegetation communities associated with Marshall's Pond and other tributaries to Gwydir River, Mehi River, and Carole Creek

Mia Mia Lagoon

**Native fish** No records

**Birds** 70 water-dependent bird species recorded, including the eastern great egret

14 water-dependent PCTs, including

- Native vegetation**
- river red gum woodlands
  - river coobah wetlands
  - coolibah woodlands and coolibah wetland woodlands
  - shallow freshwater wetland sedgeland
  - water couch marsh grasslands

**Registered cultural assets**

- Modified trees

### Hydrology

No gauge – Tycannah Creek at Horseshoe Lagoon	80 <sup>th</sup> percentile – 1.1ML/day	50 <sup>th</sup> percentile – 6.5 ML/day	20 <sup>th</sup> percentile – 32.7 ML/day
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Cease-to-flow periods and low flows are highly altered, and freshes are moderately altered as assessed by the *Gwydir WRPA* Risk Assessment. Cease-to-flow periods currently occur more



frequently and low flows and freshes occur less frequently compared to the 'without development' model scenario.

One large licence at the bottom of Marshalls Ponds Creek, which may increase downstream zero flow periods, and reduce baseflows and freshes. The principle impact may be on connectivity with Carole Creek during low flow and fresh events.

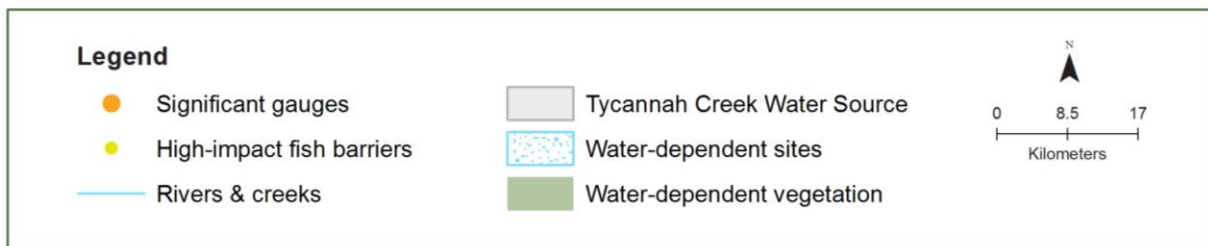
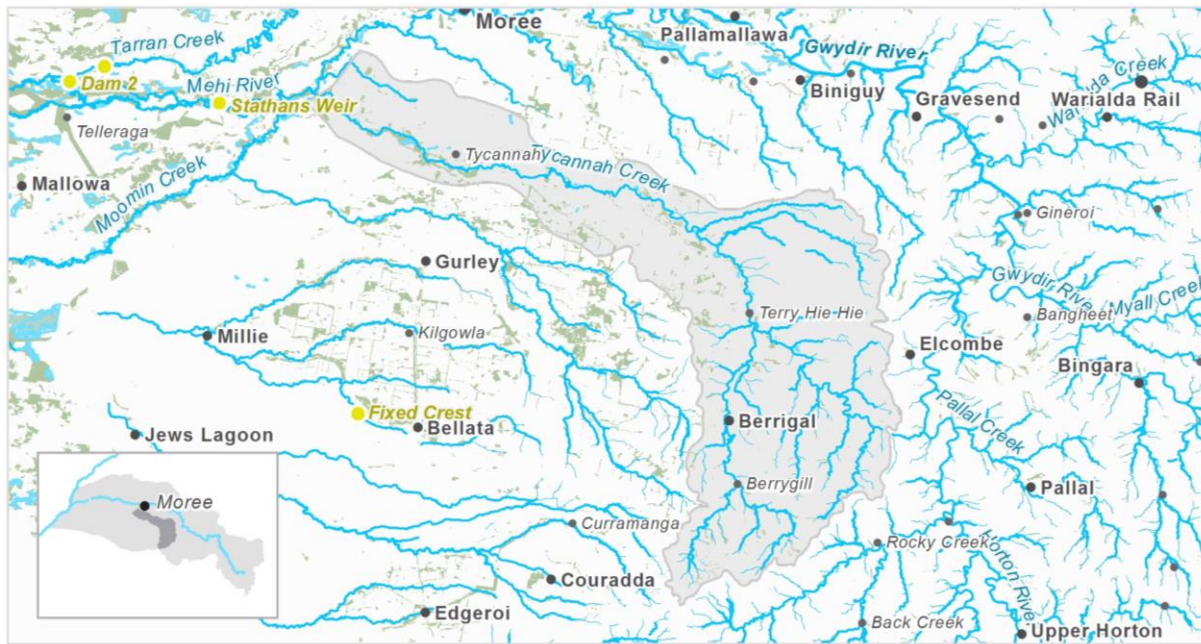
	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	H <sup>-</sup>	M <sup>-</sup>	L <sup>0</sup>
Relevant rule	Cease to pump when there is no visible flow Trade not permitted into the water source			

### Recommendations

- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on baseflows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Investigate opportunities to protect higher flows that provide connectivity with Carole Creek in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within next 5 years
- Consider implementing a total extraction limit to improve connectivity during ecologically important months
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.



## 1.41 Tycannah Creek water source



### Priority environmental assets

Horseshoe Lagoon  
Mill-Bullah Waterholes  
Menadool Lagoon

Dirty Lagoon  
Gyan Waterhole  
Tycannah Creek and its associated inchannel habitat and fringing vegetation communities

<b>Native fish</b>	• Australian smelt	• spangled perch	• carp–gudgeon
	• unspotted hardyhead	• golden perch	• bony herring
	• Murray–Darling rainbowfish	• Murray cod	• freshwater catfish

**Birds** 52 water-dependent bird species recorded, including the eastern great egret (JAMBA)

<b>Native vegetation</b>	22 water-dependent PCTs, including		
	• river red gum woodlands	• river coobah wetlands	• shallow freshwater wetland sedgeland
	• sedgeland fens wetlands	• coolibah woodlands and coolibah wetland woodlands	• water couch marsh grasslands

<b>Registered cultural assets</b>	• Modified trees	• Burial sites

### Hydrology

Gauge – Tycannah Creek (418032)	80 <sup>th</sup> percentile – 0.1ML/day	50 <sup>th</sup> percentile – 5.4ML/day	20 <sup>th</sup> percentile – 28ML/day
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Cease-to-flow periods and low flows are highly altered as assessed by the *Gwydir WRP* Risk Assessment. Cease-to-flow periods currently occur more frequently and low flows occur less frequently compared to the 'without development' model scenario.

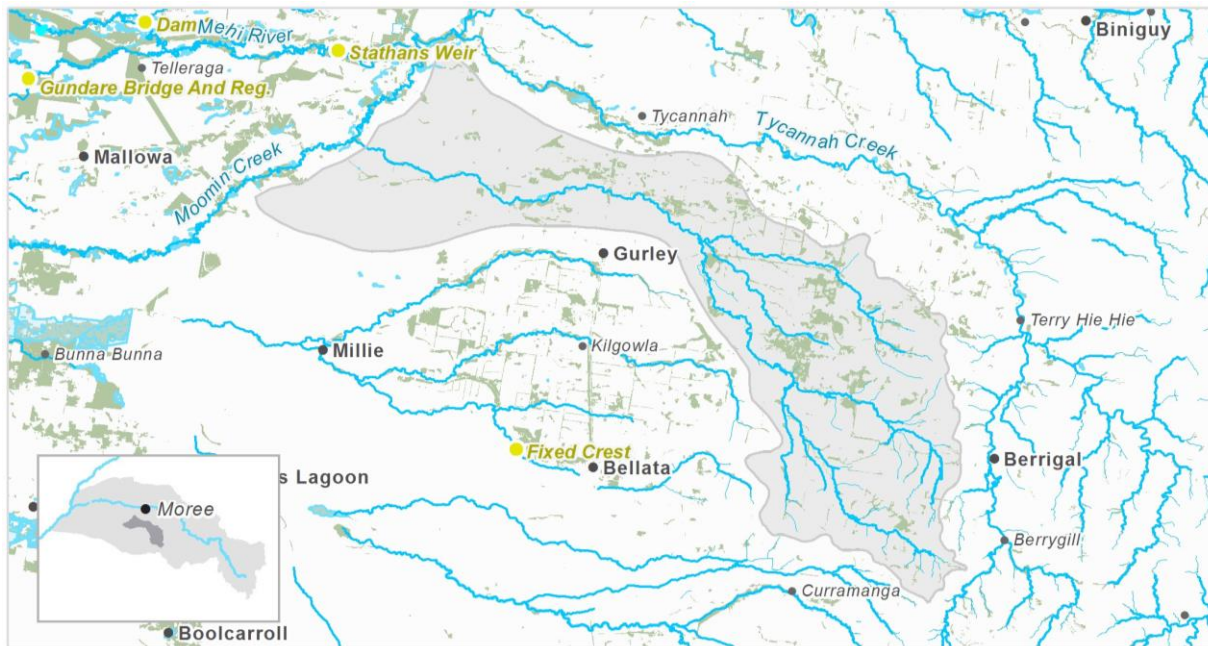
Several small licences are distributed throughout Tycannah Creek planning unit. It is characterised by very low flows, and water is mainly diverted when the rainfall has been inadequate. This means that lower flows may be substantially impacted by extraction (as confirmed by the risk assessment). In addition, one large licence exists at the bottom of Tycannah Creek, which may increase downstream cease-to-flow periods and reduce baseflows and freshes. The principle impact may be on connectivity with the Mehi River during low flow and fresh events.

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	H <sup>-</sup>	L <sup>-</sup>	L <sup>-</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

### Recommendations

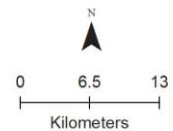
- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on baseflows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.

## 1.42 Gurley Creek water source



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks
- Gurley Creek Water Source
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

No priority environmental assets.

Important environmental assets listed below

<b>Native fish</b>	<ul style="list-style-type: none"> <li>purple-spotted gudgeon</li> <li>freshwater catfish</li> </ul>
<b>Birds</b>	<p>34 water-dependent bird species recorded, including the eastern great egret</p> <p>20 water-dependent PCTs, including</p>
<b>Native vegetation</b>	<ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>coolibah woodlands and coolibah wetland woodlands</li> <li>water couch marsh grasslands</li> <li>river coobah wetlands</li> <li>shallow freshwater wetland sedgeland</li> </ul>
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Modified trees</li> </ul>

### Hydrology

No gauge – Tycannah Creek at Horseshoe Lagoon (418032)	80 <sup>th</sup> percentile – 0.1ML/day	50 <sup>th</sup> percentile – 3ML/day	20 <sup>th</sup> percentile – 15.7ML/day
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Flows do not seem to be altered by more than 20% as assessed by the *Gwydir WRP* Risk Assessment.

There are no extraction licences in this planning unit.

Gwydir Long Term Water Plan Part B: Gwydir planning units  
Draft for exhibition

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	L <sup>0</sup>	L <sup>0</sup>	L <sup>0</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			
Recommendations				

- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.

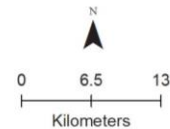


## 1.43 Millie Creek water source



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks
- Millie Creek Water Source
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

Millie Creek and its associated inchannel habitat and fringing vegetation communities

<b>Native fish</b>	<ul style="list-style-type: none"> <li>purple-spotted gudgeon</li> <li>freshwater catfish</li> </ul>
<b>Birds</b>	44 water-dependent bird species recorded
<b>Native vegetation</b>	20 water-dependent PCTs, including <ul style="list-style-type: none"> <li>coolibah woodlands and coolibah wetland woodlands</li> <li>shallow freshwater wetland sedgeland</li> <li>river red gum woodlands</li> <li>lignum shrubland wetlands</li> <li>water couch marsh grasslands</li> <li>sedgeland fens wetlands</li> </ul>
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Modified trees</li> <li>Burial sites</li> <li>Camping sites</li> </ul>

### Hydrology

No gauge – Tycannah Creek at Horseshoe Lagoon (418032)	80 <sup>th</sup> percentile – 0ML/day	50 <sup>th</sup> percentile – 0ML/day	20 <sup>th</sup> percentile – 0.6ML/day
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Cease-to-flow periods and low flows are highly altered, as assessed by the *Gwydir WRPA Risk Assessment*. Cease-to-flow periods currently occur more frequently and low flows occur less frequently compared to the 'without development' model scenario.

Two large licences exist at the bottom of Millie Creek, which may increase downstream zero flow periods, and reduce baseflows and freshes. The principle impact may be on connectivity with Moomin Creek during fresh events.

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	H <sup>+</sup>	H <sup>-</sup>	L <sup>-</sup>	L <sup>-</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			
Recommendations				

- Investigate opportunities to reduce length of cease-to-flow periods and extraction pressure on baseflows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within five years.
  - Consider rostering landholder water access during dry summer months.
  - Consider reviewing cease-to-pump rules to better protect low flows, especially during dry times or ecologically important months.
- Investigate opportunities to protect higher flows that provide connectivity with Moomin Creek in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* within next 5 years
- Consider implementing a total extraction limit to improve connectivity during ecologically important months
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use, floodplain harvesting, and water demand and review access rules if current usage is high or if the pattern changes.



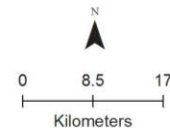
## 1.44 Thalabah Creek water source



### Legend

- Significant gauges
- High-impact fish barriers
- Rivers & creeks

- Thalabah Creek Water Source
- Water-dependent sites
- Water-dependent vegetation



### Priority environmental assets

Jews Lagoon	Thalabah Creek and its associated inchannel habitat and fringing vegetation communities	Collytootela Lagoon
Camp Lagoon		Brigalow Tree Waterhole
Pidgee Waterhole	Mallarum Waterholes	

<b>Native fish</b>	<ul style="list-style-type: none"> <li>• Carp–gudgeon</li> <li>• spangled perch</li> <li>• golden perch</li> <li>• Murray cod</li> <li>• bony herring</li> </ul>
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<b>Birds</b>	46 water-dependent bird species recorded, including the brolga
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<b>Native vegetation</b>	18 water-dependent PCTs, including
	<ul style="list-style-type: none"> <li>• black box woodland wetlands</li> <li>• coolibah woodlands and coolibah wetland woodlands</li> <li>• shallow freshwater wetland sedgeland</li> <li>• water couch marsh grasslands</li> </ul>

<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>• Modified trees</li> </ul>
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### Hydrology

No hydrological modelling data is available for this water source due to the effluent nature of the watercourse.

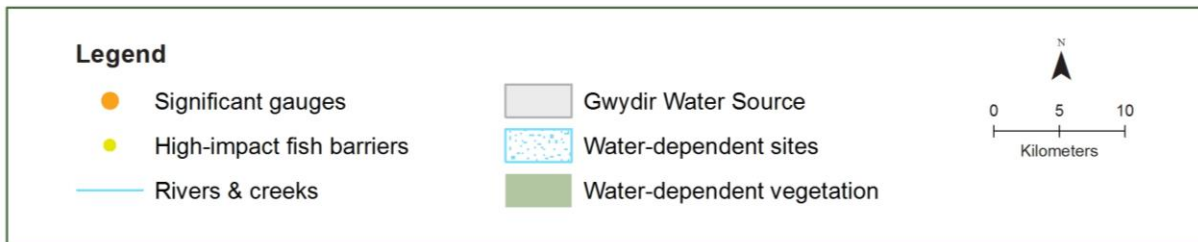
Streams are connected by overland flows.

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	NA	NA	NA	NA
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

### Recommendations

- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use, floodplain harvesting, and water demand and review access rules if current usage is high or if the pattern changes.

## 1.45 Gwydir water source



### Priority environmental assets

Outer floodplain vegetation communities associated with the Gwydir watercourse

<b>Native fish</b>	<ul style="list-style-type: none"> <li>olive perchlet</li> <li>silver perch</li> </ul>
<b>Birds</b>	27 water-dependent bird species recorded, including magpie goose, brolga & eastern great egret
<b>Native vegetation</b>	Seven water-dependent PCTs, including <ul style="list-style-type: none"> <li>black box woodland wetlands</li> <li>coolibah wetland woodlands</li> <li>river coobah wetlands</li> </ul>
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Modified trees</li> <li>Evidence of Aboriginal resources and gathering</li> </ul>

### Hydrology

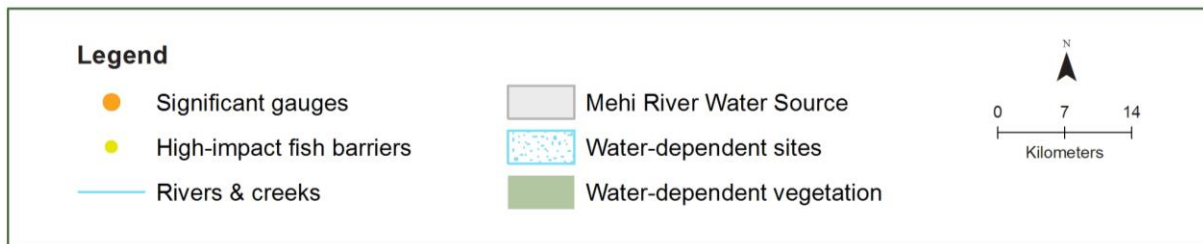
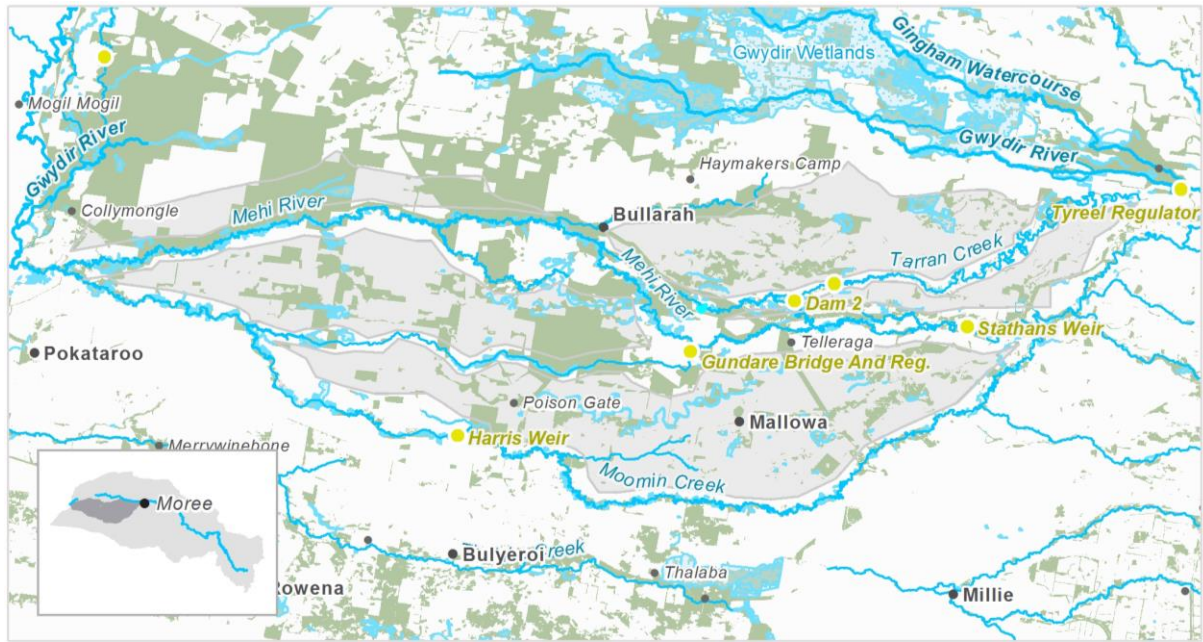
Freshes and overbank flows are highly altered as assessed by the *Gwydir WSPA Risk Assessment*. Freshes and overbank flows occur less frequently compared to the 'without development' model scenario, which may be mostly influenced by planned and held environmental water from the regulated river.

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	L <sup>0</sup>	L <sup>0</sup>	H <sup>+</sup>	H <sup>+</sup>
Relevant rules	Trade not permitted into the water source Very low flow – cease to pump when flows at Gwydir River at Millewa (418066) are ≤ 250ML/day A Class – access when flows at Gwydir River at Millewa (418066) are ≥250ML/day Access when the flow is greater than the announced environmental water flow in ML/day			
Recommendations				

- Consider protection of environmental flows from the Gingham Watercourse planning unit into the Northern Gingham Floodplain planning unit to reduce impact on freshes and overbank flows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* and the Gwydir WRPA WSP within five years.
  - Investigate providing discretionary control of a portion of planned environmental water to OEH
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.



## 1.46 Mehi water source



### Priority environmental assets

Floodplain vegetation communities

Outer floodplains associated with the Mehi River, and Mallowa and Moomin Creek

Mogo Watercourse

Wolongimba Creek

<b>Native fish</b>	• olive perchlet	• silver perch	• purple-spotted gudgeon
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70 water-dependent bird species recorded, including

<b>Birds</b>	• black-necked stork	• brolga	• wood sandpiper
	• Australian painted snipe	• Latham's snipe	• marsh sandpiper
	• eastern great egret	• cattle egret	• Caspian tern

17 water-dependent PCTs, including

<b>Native vegetation</b>	• river red gum woodlands	• coolibah woodlands and	• water couch
	• lignum shrubland	coolibah wetland woodlands	marsh
	wetlands	• black box woodland wetlands	grasslands

**Registered cultural assets**

• Modified trees

### Hydrology

Flows do not seem to be altered by more than 20% compared to the 'without development' model scenario as assessed by the *Gwydir WRPA Risk Assessment*.

Several large licences are located throughout the planning unit, which may impact on connectivity with the Mehi River during low flows or fresh events.

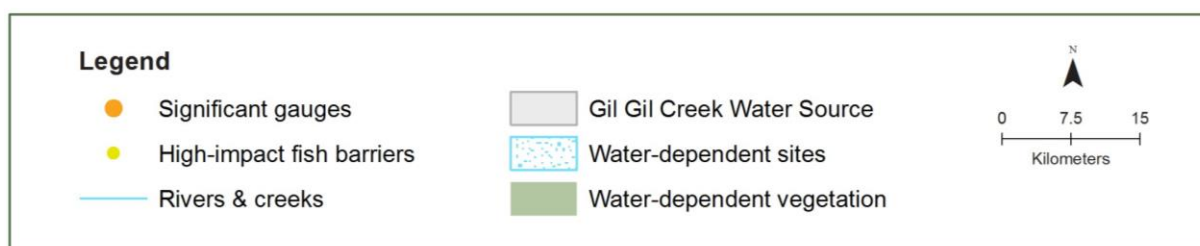
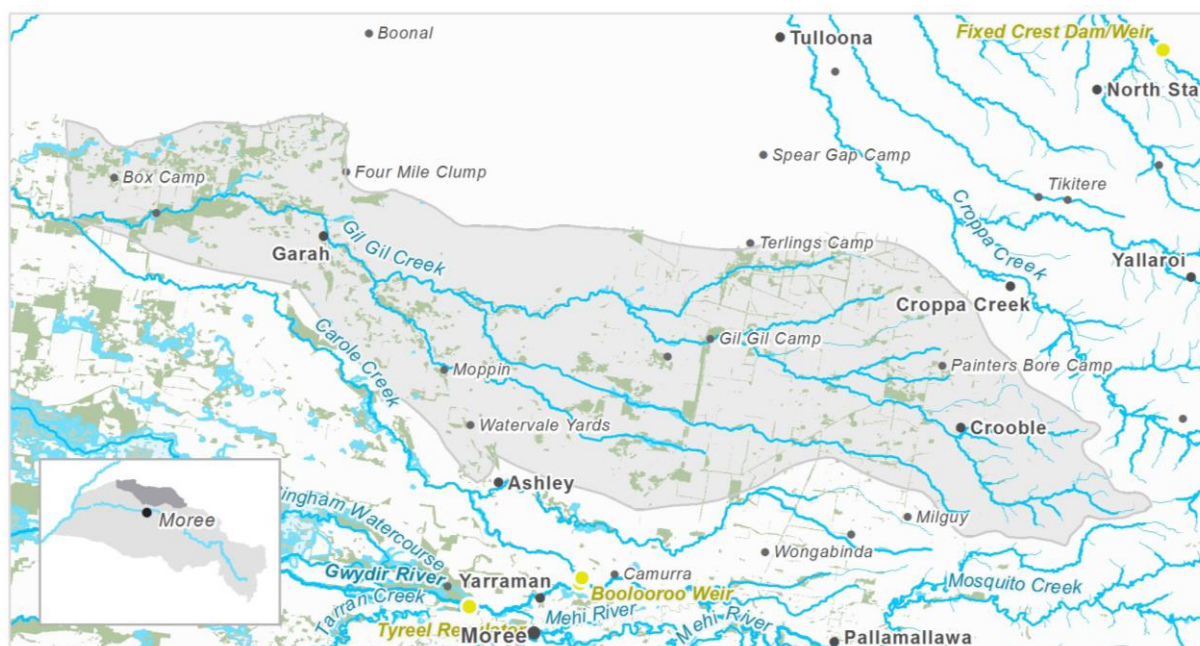
	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	L <sup>0</sup>	L <sup>0</sup>	L <sup>0</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

### Recommendations

- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use, floodplain harvesting, and water demand, and review access rules if current usage is high or if the pattern changes.



## 1.47 Gil Gil Creek water source



### Priority environmental assets

Gunnyanna Waterhole  
Wadden Wadden Waterhole  
Bengerang Waterhole

Wallon Creek  
Bengerang Waterhole  
Gil Gil Creek and its associated inchannel habitat and fringing vegetation communities

<b>Native fish</b>	<ul style="list-style-type: none"> <li>carp gudgeon</li> <li>Murray–Darling rainbowfish</li> <li>Australian smelt</li> <li>spangled perch</li> <li>golden perch</li> <li>Murray cod</li> <li>bony herring</li> </ul>
<b>Birds</b>	<p>54 water-dependent bird species recorded, including:</p> <ul style="list-style-type: none"> <li>black-necked stork</li> <li>brilga</li> <li>eastern great egret</li> <li>Latham's snipe</li> </ul>
<b>Native vegetation</b>	<p>18 water-dependent PCTs, including:</p> <ul style="list-style-type: none"> <li>river red gum woodlands</li> <li>lignum shrubland wetlands</li> <li>coolibah woodlands and coolibah wetland woodlands</li> <li>black box woodland wetlands</li> <li>water couch marsh grasslands</li> </ul>
<b>Registered cultural assets</b>	<ul style="list-style-type: none"> <li>Fishing areas</li> </ul>

## Hydrology

Cease-to-flow periods are moderately altered and low flows are highly altered, as assessed by the *Gwydir WRPA Risk Assessment*. Cease-to-flows currently occur more frequently and low flows occur less frequently compared to the 'without development' model scenario.

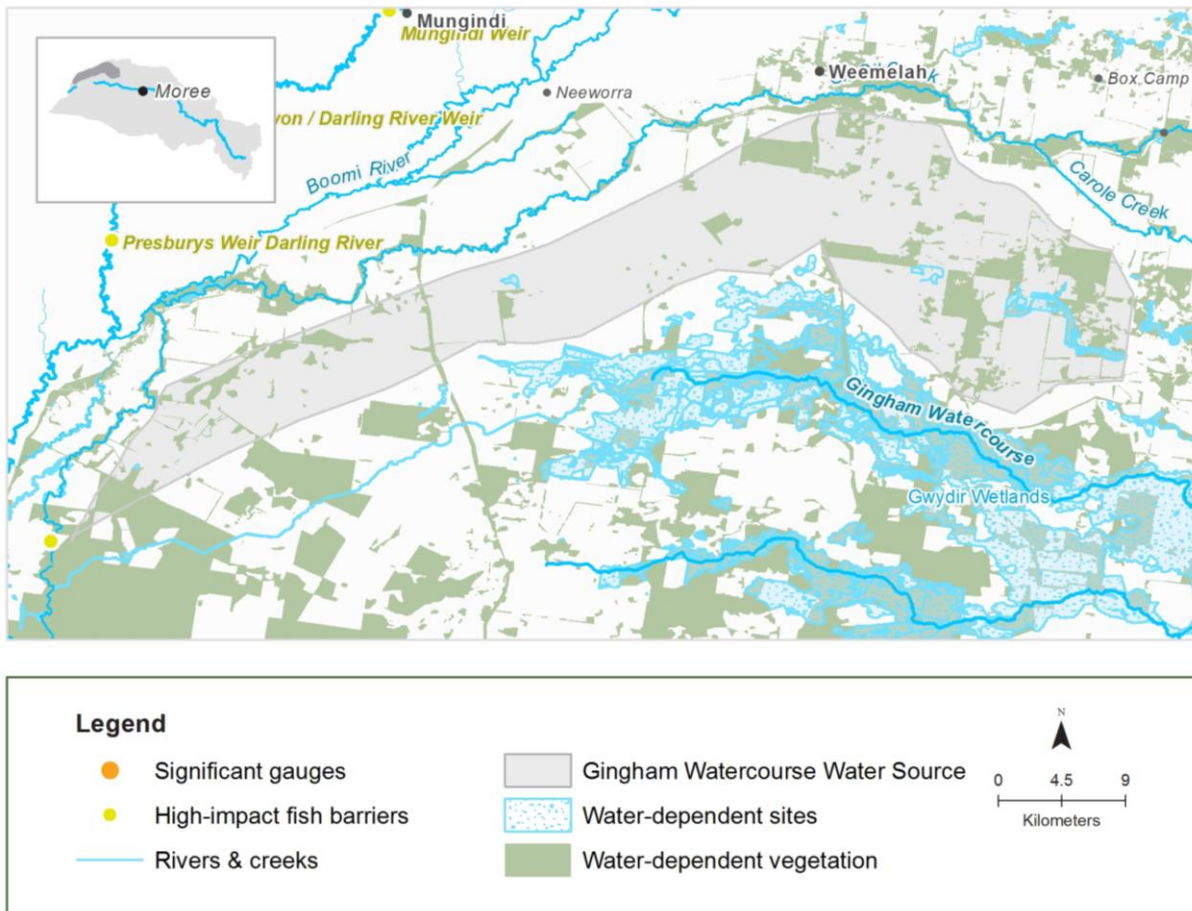
A small number of small licences are distributed along Gil Gil Creek. One large licence exists at the bottom of the unregulated section of Gil Gil Creek, which may impact on connectivity with the downstream regulated section.

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	M <sup>+</sup>	H <sup>-</sup>	L <sup>-</sup>	L <sup>0</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

## Recommendations

- Investigate potential impact of extraction pressure on ability to meet EWRs in the Gil Gil planning unit within five years.
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.

## 1.48 Gingham water source



### Priority environmental assets

Outer floodplain vegetation communities associated with the Gingham watercourse

<b>Native fish</b>	<ul style="list-style-type: none"> <li>olive perchlet</li> <li>freshwater catfish</li> <li>silver perch</li> </ul>
<b>Birds</b>	Eight water-dependent bird species recorded including the eastern great egret (JAMBA)
<b>Native vegetation</b>	13 water-dependent PCTs, including <ul style="list-style-type: none"> <li>black box woodland wetlands</li> <li>coolibah woodlands and coolibah wetland woodlands</li> <li>water couch marsh grasslands</li> </ul>
<b>Registered cultural assets</b>	None registered

### Hydrology

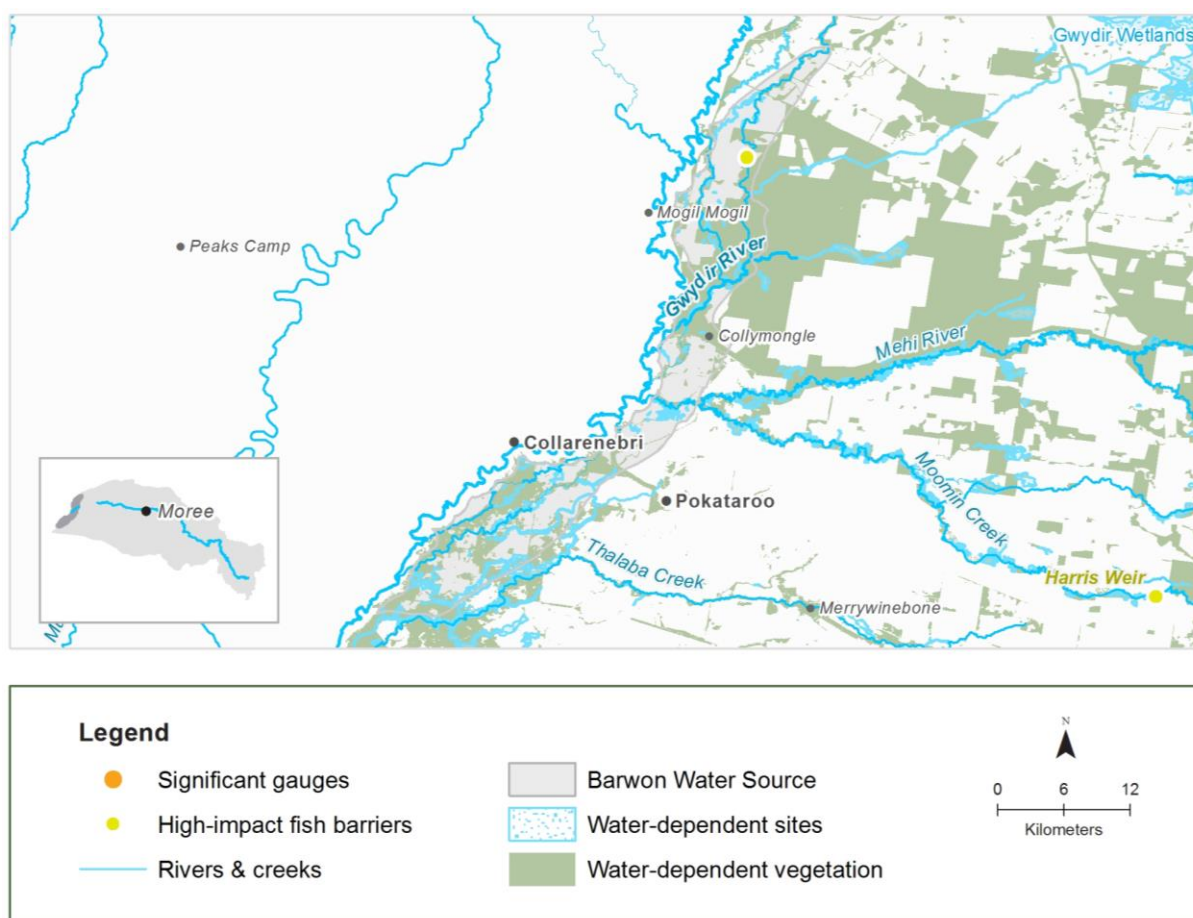
Freshes and overbank flows are highly altered as assessed by the *Gwydir WSPA* Risk Assessment. Freshes and overbank flows occur less frequently compared to the 'without development' model scenario, which may be mostly influenced by planned and held environmental water from the regulated river.

One larger licence exists within the Gingham water source planning unit.

	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	L <sup>0</sup>	L <sup>0</sup>	H <sup>-</sup>	H <sup>-</sup>
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source Access when the flow is greater than the announced environmental water flow in ML/day			
	<b>Upper Gingham Watercourse MZ</b> Cease to pump when flows at Tillaloo (418076) is≤250ML/day A Class – access when flow at Tillaloo (418076) is ≥250ML/day	<b>Lower Gingham Watercourse MZ</b> Very low flows – access when the flow depth at Gingham Bridge (418079) is >1m and <4000ML/day and there is visible flow at the Gingham Watercourse at Morialta Road A Class – cease to pump when the flow depth at Gingham Bridge (418079) is <1m and <4000ML/day and there is no visible flow at the Gingham Watercourse at Morialta Road		
Recommendations				

- Consider protection of environmental flows from the Gingham Watercourse planning unit into the Northern Gingham Floodplain planning unit to reduce impact on freshes and overbank flows in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* and the Gwydir WRPA WSP within five years.
  - Investigate providing discretionary control of a portion of planned environmental water to OEH
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*.
- Monitor for changes in land use, floodplain harvesting and water demand and review access rules if current usage is high or if the pattern changes.

## 1.49 Barwon water source



Priority environmental assets			
Collymongle Lagoon The Big Waterhole First Lagoon		Second Lagoon Butti Lagoon Floodplain and wetland vegetation communities associated with Barwon River	
Native fish	<ul style="list-style-type: none"><li>olive perchlet</li><li>silver perch</li><li>carp–gudgeon</li></ul>	<ul style="list-style-type: none"><li>golden perch</li><li>spangled perch</li><li>Murray cod</li></ul>	<ul style="list-style-type: none"><li>Murray–Darling rainbowfish</li><li>bony herring</li><li>Australian smelt</li></ul>
Birds	24 water-dependent birds recorded, including white necked heron & little pied cormorants		
Native vegetation	10 water-dependent PCTs, including <ul style="list-style-type: none"><li>river red gum woodlands</li><li>black box woodlands</li><li>coolibah woodlands and coolibah wetland woodlands</li><li>lignum shrubland wetlands</li></ul>		
Registered cultural assets	None registered		
Hydrology			

No extraction licences in this planning unit



	Cease-to-flow	Low flow and Baseflow	Freshes	Overbanks
Hydrological alteration	N/A	N/A	N/A	N/A
Relevant rules	Cease to pump when there is no visible flow Trade not permitted into the water source			

### Recommendations

- Investigate opportunities to protect flow rates from the Lower Mehi and Gil Gil planning units that provide connectivity with the Barwon River during ecologically relevant times in the *Water Sharing Plan for the Gwydir Unregulated Water Sources* and the *Gwydir Regulated River Water Sharing Plan* within five years
- Maintain current rules in the *Water Sharing Plan for the Gwydir Unregulated Water Sources*
- Monitor for changes in land use and water demand and review access rules if current usage is high or if the pattern changes.