Great Forester River Water Resources Information - Summary

REVIEW AND AMENDMENT OF THE GREAT FORESTER CATCHMENT WATER MANAGEMENT PLAN

JULY 2020

Water and Marine Resources Division
Department of Primary Industries, Parks, Water and Environment

Tasmanian Government

Preferred Citation:

DPIPWE (2020). *Great Forester River Water Resources Information. Review and Amendment of the Great Forester Catchment Water Management Plan. Summary*. Version 4 - June 2020. Department of Primary Industries, Parks, Water and Environment, Hobart, Tasmania.

The Department of Primary Industries, Parks, Water and Environment (DPIPWE)

The Department of Primary Industries, Parks, Water and Environment provides leadership in the sustainable management and development of Tasmania's natural resources. The Mission of the Department is to support Tasmania's development by ensuring effective management of our natural resources.

The Water Resources Group provides a focus for water management and water development in Tasmania through a diverse range of functions, including implementing the *Water Management Act 1999* and the National Water Initiative; design of policy and regulatory frameworks to ensure sustainable use of surface water and groundwater resources; monitoring, assessment and reporting on the condition of the State's freshwater resources; and facilitating water infrastructure development projects.

Summary

The Great Forester Catchment Water Management Plan was the first plan to be prepared in Tasmania and was adopted in 2003. The Plan is currently being reviewed by the Department of Primary Industries, Parks, Water and Environment. This is being conducted in consultation with key stakeholders, including organisations and community members with an interest in water management, through the Great Forester River Catchment Water Management Plan Consultative Group. As part of the review process, a range of scientific and technical information has been collated to look at what has changed in the catchment over time and how effective the Plan has been in delivering its water management objectives.

This report provides a summary of the scientific and technical, demographic and industry information to inform the Consultative Group about the current status of the catchment and trends in hydrological, ecological and water management indicators. This information is based on the best available data and knowledge, and provides the background needed to make evidence-based decisions. A list of key findings are provided below.

Key knowledge about the Great Forester River catchment

Climate

- Rainfall analysis shows a decreasing trend with the annual average over the last 10 years being 6% less than the historical average.
- Evaporation analysis does not clearly show a long-term trend over the 48 years; however, the last 20 years shows a marked increasing trend.

- Temperature analysis shows an increasing trend of about 0.2°C per decade.
- Annual average water yield across the Great Forester-Brid catchment is predicted to reduce by 14% under a dry future climate.

Surface water hydrology

- The Great Forester River has a strong seasonal flow pattern that is wetter in winter and drier in summer.
- Since the Plan was adopted, average water yields at the stream flow gauge (upstream of the Forester Road Bridge) have decreased from 81 GL/year to 65 GL/year, while rainfall has decreased by approximately 6% and water allocation has increased.
- 7-day low-flows show a decreasing trend over the period of record.

Groundwater systems

- The majority of higher yielding bores have been drilled in the northern half of the Tertiary Sedimentary Basin (lower catchment). Groundwater quality in the catchment is generally very good (Salinity (Total Dissolved Solids) concentrations averaging 393 mg/L with a median of 170 mg/L).
- Groundwater extraction is believed to be low in the Great Forester-Brid catchment; however, there is uncertainty regarding actual extraction rates and a limited ability to monitor the resource condition.
- Groundwater levels can be affected by changes in the amount of recharge to the groundwater system and by extraction of groundwater from the system.
- There is potential for further groundwater development of groundwater resources in the catchment, especially in Tertiary and connected Quaternary aquifers. This could increase as surface water resources become fully allocated and scarce.
- Poorly understood and planned groundwater development may lead to unsustainable levels of extraction over time, particularly at the local scale. This could cause a number of adverse impacts (e.g. well drawdown interference, reduced groundwater discharge to streams or to groundwater-dependent ecosystems, seawater intrusion in coastal sediment aquifers, etc.).
- The largest component of flow into the aquifers is rainwater recharge and the major discharge component is baseflow to rivers. Current understanding indicates that groundwater discharge is a significant contributor to stream flows in the catchment, which has important implications both for surface water availability and for water quality.
- Water level data from the available monitoring bores indicates a stable condition over the last 28 years, and demonstrate similar winter-summer recharge, and discharge trends, which are predominantly influenced by climate (variable rainfall). Steady winter recharge rates and the flow of water from the upper part

of the aquifer is keeping the aquifer system in equilibrium in the lower part of the catchment and along the coast.

- Despite the limitations with available monitoring data, all available information suggests that current levels of groundwater extraction are not having lasting, significant impacts on groundwater levels in monitored areas of the catchment.
- Existing monitoring bores at Waterhouse and Scottsdale are used to monitor water levels. Future development of the monitoring network will be considered in accordance with management priorities.
- Given the current estimated 'low risk', the Department will amend the Plan to remove the existing requirement for groundwater licensing and allocation.
- A Groundwater Risk Management and Evaluation Framework will monitor and evaluate changes to risk to support future groundwater management.

Freshwater ecosystem values

- There are a range of important freshwater ecosystems in the Great Forester River catchment including: McKerrows Marsh, Bridport estuary (Trent Water) and sections of river along the Great Forester, and lower parts of the Hurst Creek, Coxs Rivulet and Tuckers Creek.
- McKerrows Marsh is a blackwood-paperbark swamp of state and regional significance, providing important habitat for a range of animal and plant species and communities, including those that are threatened.
- Freshwater ecosystems within the Great Forester River support many threatened animal and plant, species and communities, including the endangered Scottsdale burrowing crayfish, and the vulnerable giant freshwater crayfish and Australian grayling.
- Knowledge of the ecology of the green and gold frog and the striped marsh frog is limited, particularly in relation to their reliance on surface water hydrology and groundwater level fluctuations. They breed and recruit in densely vegetated, permanent, fresh waterbodies, where aquatic vegetation is abundant. During their early developmental stages (tadpole), both species are totally reliant on standing water.
- Burrowing crayfish may be directly connected to streams and waterbodies, may connect to groundwater, or may simply rely on runoff for water. In the Great Forester River catchment, *Engaeus* burrows are found in drainage channels, riverbanks and wetland areas, where there is a clear connection to a permanent water supply.
- Large, adult giant freshwater crayfish inhabit deeper pool habitat in rivers, preferring locations with an abundance of decaying timber and with good riparian cover. These areas are generally less impacted by changes in flow associated with summer water extraction. However, in smaller streams risks are greater.

- Juvenile giant freshwater crayfish prefer shallow (0.1 – 0.25 m) riffle habitat dominated by larger rocks (boulder and cobble) where fine sediments and silt are absent. When flow reduces juvenile crayfish don't move from shallow areas, instead they burrow deeper into the substrate.
- Australian grayling require adequate flows (especially during autumn) to allow for movement down the river to use downstream habitats for spawning and then migrate up rivers for the remainder of the year, to seek refuge and food resources.

Aquatic ecosystem condition

- According to waterbugs, the health of the Great Forester River system, appears to have declined in recent years, particularly since 2014.
- There are healthy populations of native fish in the Great Forester River and there is an abundant population of introduced brown trout (a valuable species for recreational angling) in the upper reaches of the river.
- Despite a long-term decline in inundation events in the wetland, the dominant forest communities (blackwood and coastal paperbark) within McKerrows Marsh are in good condition and appear to be stable.
- The presence of burrowing crayfish chimneys within McKerrows Marsh suggests that suitable water regime conditions are being maintained to sustain their populations.

Surface water management

- The main industries in the Great Forester catchment that rely on water are cropping (vegetables), dairying and beef cattle. Perennial horticulture and aquaculture are also present.
- Since 2003, there has been an increase in the volume of licensed surface water allocated for commercial use (primarily irrigation) by approximately 31,000 ML. Surety level 5 water has increased by 6000 ML, Surety 6 by 22,500 ML (noting that approximately 21,100 ML represents the volume allocated in relation to historic summer use prior to 2003) and Surety 7 by 2200 ML.
- The volume of extractions in the summer take period relates to water allocated to authorise historic water use in 2003. This volume was allocated prior to the development of the Department's current Surface Water Allocation Decision Framework. The allocated volume in summer is well in excess of limits that would be applied under the current policy, and no new water allocations will be made.
- Despite the high volumes of allocation in summer, the risk of extraction impacting low flows is managed through daily access rules (30 ML/day Managed Minimum Flow threshold) that restricts access when flows fall to low levels.

- The higher than normal levels of summer allocation will mean that there is a lower likelihood that full volumes of Surety 6 allocations will be accessible in summer.
- Water is available for allocation during winter. The Department will take unallocated historic water use into account when determining how the remaining water will be allocated.
- Forty dam permit applications have been approved since the Plan was adopted in 2003; most of them for irrigation purposes.
- There has been a slight decrease in the number of dam permits granted per year in the last 16 years.
- Excluding two large dams (>2000 ML), the storage capacity of dams approved since 2003 ranges widely (0.2 ML to 640 ML).
- Dam permit approvals tend to increase following dry years (e.g. 2007/08 and 2015/16).
- In dry years, small summer freshes are very short-lived and increase flows in the river for only 2 to 3 days.
- Based on an analysis of days of summer access over the last 15 years:
  - Surety 5 licence holders had unrestricted access for more than 80% of days 9 out of 15 years; and unrestricted access for more than 50% of days 12 out of 15 years.
  - Surety 6 licence holders had unrestricted access for more than 80% of days 6 out of 15 years; and unrestricted access for more than 50% of days 12 out of 15 years.
- For summer, using the existing 30 ML/day managed minimum flow and the Surety 5/Surety 6 allocation, there is a low probability that full allocation volumes will be available within a given year (~ 45% of years or 9 years in the last 20 years).
- Winter water has higher reliability with winter volumes being available 9 years in 10 over the same period 20 year period.
- Almost 100% of licensed water users who take directly from the Great Forester River during the summer irrigation season have meters on their offtake points. It is unknown what proportion of winter takes are metered.

Demographic and industry profile

- The agriculture, forestry and fishing sector employs the greatest number of people in the Great Forester River catchment.
- The main agriculture businesses operating in the Great Forester River catchment area are specialised beef cattle farming, vegetable growing, grain-sheep and grain beef cattle farming, and dairy farming.

- There is potential for an additional 9.7% or 62 km^2 of the Plan area to be expanded for irrigation purposes, assuming all irrigable land (land capability classes 1 to 4) is available for further development.
- Tourism in the Great Forester River region is important but how it relates to the waterways is unknown.
- The brown trout fishery in the Great Forester River is not important in a statewide context.

Water entities within the Plan area

- The Great Forester Irrigation Scheme (managed by Tasmanian Irrigation), with the capacity to supply 1980 ML of water, commenced operation during the 2011/12 irrigation season and supplies water to users within the Great Forester Irrigation District, from Headquarters Road Dam (South Springfield) down the Great Forester River.
- The Scottsdale Irrigation Scheme has recently been constructed and is expected to be fully operational by December 2020. It will have the capacity to supply 8600 ML of water to users within the Scottsdale Irrigation District, via pipe from Headquarters Road dam (South Springfield) and down the Great Forester River and Hurst Creek.

Water regime

- The existing Great Forester River WMP does not contain environmental water provisions for the winter period. A monthly 10^{th} percentile flow statistic is proposed for further consideration with the aim of preserving seasonality in the baseflow component of the water regime whilst ensuring reasonably certain access for water extraction.
- The current 30 ML/day Managed Minimum Flow (that applies during the summer irrigation season) maintains adequate water depth through shallow parts of the middle and lower river system to enable fish movement upstream and downstream, which can be a critical mechanism by which fish can escape adverse environmental conditions (e.g. high water temperature and low dissolved oxygen).
- Daily flow pulsing is evident in both the upper and lower Great Forester River. This appears to have increased in magnitude during the life of the Plan and at times can now reduce stream flow by as much as 70%.
- An analysis of conservation value (CFEV) showed that the middle and lower reaches of Hurst Creek contain significant conservation values while the upper reaches have moderate to low conservation priority. The majority of Coxs Rivulet is of moderate conservation priority. The upper catchment sections of both these streams are in poor condition, mainly due to catchment modifications and the proliferation of instream dams.

- Baseflow environmental water provisions based on 20th percentile winter flows and 30th percentile summer flows have been reviewed for Hurst Creek and Coxs Rivulet. The provisions may be reduced to simple seasonal minimum flows as follows:

	Summer (Oct – Apr)	Winter (May – Sep)
Hurst Creek	15 ML/day	35 ML/day
Coxs Rivulet	20 ML/day	45 ML/day

- Important ecosystem values that occur within, or utilise habitat provided by McKerrows Marsh, include: Australian grayling and other migratory native fish, burrowing crayfish, paperbark-blackwood forest vegetation and several frog species.
- The groundwater aquifer beneath the marsh is an important water source sustaining the wetland ecosystem and a water level threshold has been identified which can be used to manage future local groundwater extraction to minimise impact on the water budget of the wetland.
- As streamflow at the Forester Road gauging station approaches the 30 ML/day restriction trigger under the Water Management Plan, it has been shown that local groundwater beneath the marsh does not substantially increase local streamflow in the lower Great Forester River. It is therefore appropriate that water access in the lower water management zone be subject to similar restriction thresholds as users elsewhere in the catchment.
- High flow events or floods (those of a magnitude of 1800 ML/day) are an important component of the Great Forester River flow regime that need to be preserved to maintain ecosystem processes and character. In addition to watering the wetland itself, flood events also replenish the local groundwater system.