ACT and Region Catchment Management Coordination Group

Annual Report
2021–22

Cover images:
Landcare group site tour at Kuringa Drive Woodlands and Mt Taylor Scouts with bags of leaves for a Leaf Collective competition weigh-in, with Ministers Vassarotti and Rattenbury and other supporters.

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Chair's Foreword

It is my pleasure to present the 2021-2022 Annual Report for the ACT and Region Catchment Management Coordination Group ('the Coordination Group') and in so doing, I acknowledge the Ngunnawal people as traditional custodians of the ACT and surrounding areas. I honour their continuing culture and the contribution they make to the life of Canberra and the region. I also acknowledge all other First Nations people in the region and across Australia, and pay my respect to all Elders past, present and emerging.

I am delighted to report that I have recently received nominations from the Dhawura Ngunnawal Caring for Country Committee for a male and female traditional custodian to join the Coordination Group. The Minister will be informed of the nominations, and he will make the final decision. Following the lead of our First Nations community is integral to caring for country here in the ACT and in the surrounding region.

The Coordination Group has had a number of very productive meetings this year, as follows:

- Quarter 1 – meeting held over two sessions on 30 July 2021 and 19 August 2021
- Quarter 2 - special meeting held on Queanbeyan Sewerage Treatment Plant (QSTP) on 14 December 2021
- Quarter 3 – meeting held over two sessions on 30 March 2022 and 31 March 2022
- Quarter 4 – meeting held on 28 June 2022.

I thank Icon Water, who volunteered to provide secretariat support during March 2022 when Environment, Planning and Sustainable Development Directorate (EPSDD) staff were unavailable.

We are lucky to have such a diverse membership, who bring to the table significant expertise in water security and quality management, policy, planning, ecological management and regional development. Their commitment to work in a cooperative, supportive manner is commendable.

I would like to thank:

» Mr Peter Tegart for his contribution to the Coordination Group during his time as Chief Executive Officer of the Queanbeyan-Palerang Regional Council (QPRC) and welcome Ms Rebecca Ryan, the new Chief Executive Officer of the QPRC.

» Ms Narelle Sargent for her contribution and welcome Dr Su Wild-River as the Environmental Protection Authority (EPA) executive observer at Coordination Group meetings.

» Mr Michael Ross for his support and welcome Mr Ryan Breen and Ms Rinzin Lhamo from EPSDD who have taken on the roles of adviser and secretariat, respectively.

Much has been achieved by Coordination Group members in 2021-22. Water quality has been a strong focus for the group, particularly given the QSTP upgrades and the need to ensure that discharges from it are managed so that the water quality of Lake Burley Griffin is protected. There were various opportunities for the group to contribute to policy and planning discussions, share research to inform decision-making and promote community understanding of, and engagement with catchment management issues.

2021-2022 Highlights

Advice Provided to the Minister

The Coordination Group hosted Minister Rattenbury at our quarter 1 meeting where we discussed the complexities involved in upgrading the QSTP, including the need for more research to inform our understanding of algal blooms in Lake Burley Griffin.

Following this meeting and another one in December, and after much careful consideration, the Coordination Group provided Minister Rattenbury with advice in March 2022. Minister Rattenbury expressed his appreciation for this advice in a response letter in July 2022.

Several Coordination Group members joined me in meeting with Minister Rattenbury on 14 June 2022 where we discussed:

» First Nations representation on the Coordination Group and the nominations that had been received from the Dhawura Ngunnawal Caring for Country Committee.

» The Coordination Group's areas of focus in the preceding six months, including matters related to the QSTP and the use of purified wastewater in inland settings.

» Regional water management issues impacting the water security for communities and the environment along the upper Murrumbidgee River.

Stakeholder and Community Engagement

Coordination Group members and the Upper Murrumbidgee Catchment Network (UMCN), which is funded by the group, were active in the community this year, facilitating discussions and promoting educational messages about issues affecting catchments in the ACT and surrounding regions.

» The UMCN, hosted a number of educational events, including a virtual tour of an award-winning ecological farm, a cool burn with Traditional Custodian Wally Bell and an on-line Water Security forum.

» The Australian River Restoration Centre (UMCN member) undertook a range of activities to increase awareness of the declining health of the Upper Murrumbidgee River, including hosting a community meeting and developing a new website called The Forgotten River. The website aims to stimulate community action towards a sustainable future for the upper Murrumbidgee River.

» EPSDD provided funding to support the continuation of the H2OK program being run through the ACT Healthy Waterways partnership. "Only rain down the stormwater drain" is the take home message of this program, which is aimed at improving the health of Canberra's urban waterways.

» Concurrently, Icon Water has been running a community engagement program, Let's Talk Water and Wastewater, to understand Canberrans' priorities and views on issues such as water security, pricing and affordability.

» The ACT Government and Icon Water also continued co-funding of the Cooma Waterwatch Coordinator contributing to water quality protection and monitoring in the Upper Murrumbidgee.

» We were also fortunate during 2021-22 to have a variety of academic, policy and regulatory experts joining our meetings to share their knowledge and expertise.

August 2021

» Professor Fiona Dyer from the University of Canberra provided insights into the relationship between phosphorous and algal blooms in Lake Burley Griffin.

» Hunter H2O, the engineering firm advising on the upgrades to the QSTP, participated in discussions about managing effluent flow into ACT waterways.

» Dr Ralph Ogden, Program Manager for Healthy Waterways, provided an update on the Healthy Waterways education program and an outline of future initiatives under the program.

March 2022

» Peter Hyde from the New South Wales Department of Planning and Environment (NSW DPE) delivered a presentation and participated in discussion about NSW Regional Water Strategies.

» Mahala McLindon and Paul Simpson from NSW DPE presented to the Group on the Snowy Water Licence Review, which defines the water rights and obligations of Snowy Hydro Pty Ltd.

Emma Collins from the Natural Resources Commission participated in a discussion of the key issues raised in the Coordination Group's February 2022 submission to the review of the Water Sharing Plan to the Murrumbidgee Unregulated River Water Sources 2021 (copy at **Appendix C**).

» Danielle Francis from the Water Services Association of Australia provided insights and participated in an "all options on the table" discussion about diversified water supply.

June 2022

» Dr Sophie Lewis, ACT Commissioner for Sustainability and the Environment, presented an overview on the investigation report on the State of the ACT's Lakes and Waterways.

» Dr Su Wild-River from the EPA provided an overview of the organisation's role and the activities it is undertaking to protect catchments in the ACT and surrounding regions.

2022-23 Priorities

The Coordination Group will continue to advise, and respond to requests by the Minister for Water, Energy and Emissions Reduction and undertake actions to achieve the ACT and Region Catchment Strategy 2016-2046.

Priorities for 2022-23:

- undertake the first review of the inter-jurisdictional investment and resourcing framework that guides members' contributions and expenditure efforts (Action 1 in Strategy)
- advance actions to inform a catchment wide assessment of vulnerability to climate change (Action 4)
- continue to support the roles and work undertaken by peak stakeholder groups, volunteers, landowners, and managers (Action 7)
- continue to build community understanding about catchment health (Action 9)
- contribute to an integrated catchment planning approach for growth and settlement patterns in the ACT and Region (Action 10)
- advance actions to build water security and protect the catchments of the ACT and region (Action 12)
- further progress Ngunnawal representation on the Coordination Group (Action 14).

The Coordination Group will stay abreast of water planning policies and regional planning reviews that are underway in the ACT and NSW to inform the timing for reviewing the *ACT and Region Catchment Strategy 2016-2046 and 2016 – 2021 Catchment Management Implementation Plan*. Furthermore, the *ACT and Region Catchment Post Emergency Recovery Plan* (2018) will be examined to determine if it needs amending.

My thanks go to all those who worked with the Coordination Group throughout the year, as well as our members whose ongoing contributions are integral to preserving the health of ACT and Region catchments now and into the future.

Dr Maxine Cooper
Independent Chair
September 2022

1. Background

The establishment of an interjurisdictional coordination body to strengthen governance and catchment management in the ACT and surrounding regions was approved by the ACT Government in October 2014. The Coordination Group was established on an interim basis on 25 February 2015.

On 4 August 2015, the ACT Legislative Assembly passed the *Water Resources (Catchment Management) Amendment Act 2015*, which amended the *Water Resources Act 2007* and established the Coordination Group as a statutory body.

The Coordination Group is also specified in the work plan for the ACT and NSW Memorandum of Understanding for Regional Collaboration, which was re-signed in 2020.

This report outlines the activities of the Coordination Group from 1 July 2021 to 30 June 2022 and fulfils the Coordination Group's obligations under Part 7A section 67D of the *Water Resources Act 2007*.

1.1 Coordination Group Functions

The Coordination Group is committed to improving governance of catchment management within the region. It works for the long-term benefit of the ACT and region catchments and the people who reside therein.

It aims to:

- be a responsive, dynamic and representative body which works in a fair, open and collaborative manner
- take a holistic approach to understanding and managing the catchment
- promote a whole-of-catchment and whole-of-government approach to improving the catchment's health in the long term, using best available science and community engagement to support its work.

The Coordination Group was established to:

- advise the ACT Minister for Water, Energy and Emissions Reduction
- improve coordination, cooperation and direction of effort in catchment management across the ACT and region
- facilitate collaborative problem solving for interjurisdiction and interagency issues
- provide advice on opportunities to align national, regional and territory investment in the context of integrated catchment management
- foster the implementation of the *ACT and Region Catchment Strategy 2016-2046*
- provide advice on proposed developments in terms of their likely impacts and strategies and actions to mitigate any risk to catchment health
- undertake other matters as determined by the Minister

1.2 Geographical area of the ACT region water catchments

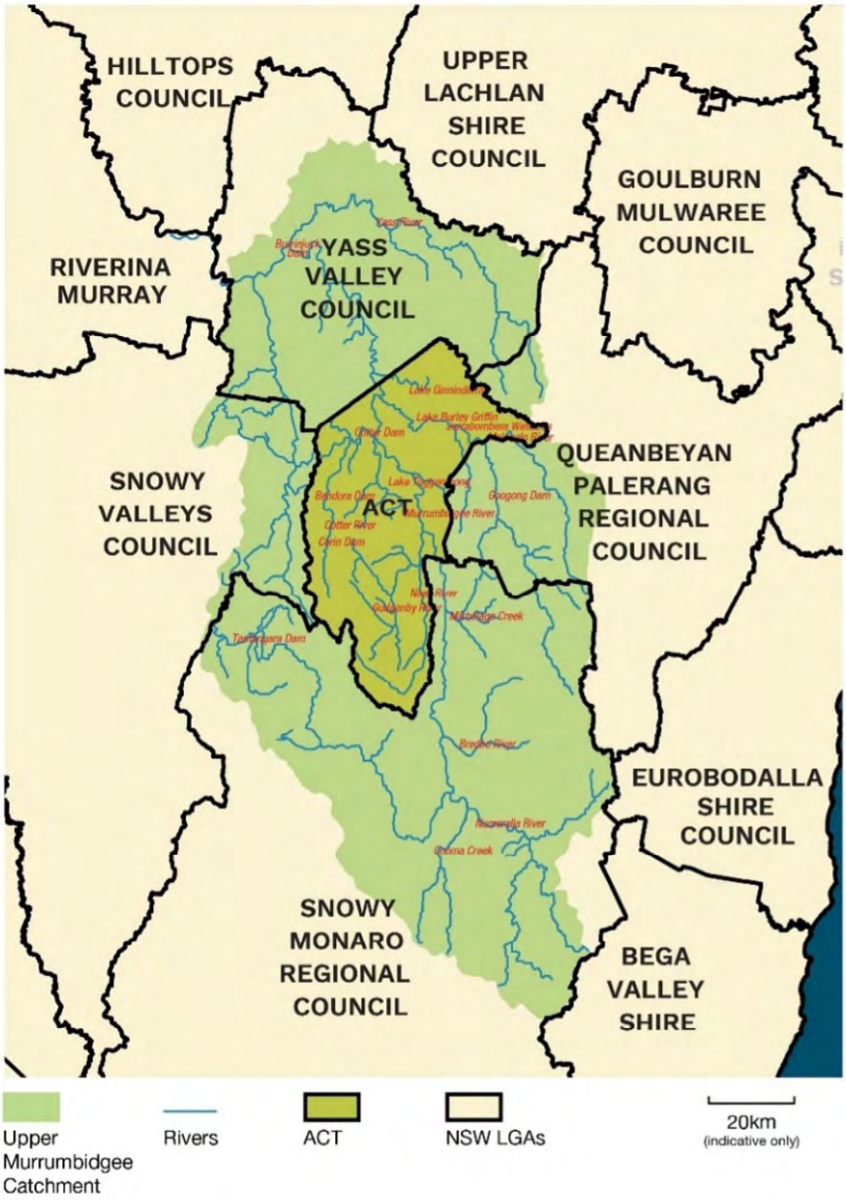
The Coordination Group's geographical area of interest is the Upper Murrumbidgee Catchment that constitutes the ACT and parts of the local government areas of:

» Snowy Monaro Regional Council

» Queanbeyan-Palerang Regional Council

» Yass Valley Council.

The Upper Murrumbidgee Catchment covers approximately 14,000 km^2 with its headwaters originating above Adaminaby and flowing through to Burrinjuck Dam.



2. Membership

ACT and Region Catchment Management Coordination Group Chair

Dr Maxine Cooper

The role of the Chair is to independently facilitate a collaborative process between jurisdictions to ensure the best outcomes are achieved. Dr Cooper, who is an adjunct Professor with the University of Canberra, has extensive leadership experience, having held key positions including ACT Auditor-General, ACT Commissioner for Sustainability and the Environment, and Chair and Executive Director of the ACT Water Security Taskforce. Dr Cooper is also the independent Chair of Landcare ACT and is Deputy Chair of the National Landcare Network.

ACT and Region Catchment Management Coordination Group Community Representative

Ms Karissa Preuss

The Community Representative's role within the Coordination Group is to contribute to discussions about the role and work undertaken by peak stakeholder groups, volunteers, community groups, property owners and land managers in maintaining and improving the region's catchments and waterways. Ms Karissa Preuss was appointed to the role of independent Community Representative in October 2019 and brings a wealth of experience in community engagement and representation in natural resource management from both a practical and theoretical level. Ms Preuss currently holds a number of key community leadership roles including CEO of Landcare ACT, ACT representative on the National Landcare Network Members Council and Executive Committee Member of the UMCN.

ACT Emergency Services Agency (ESA)

Commissioner, Ms Georgeina Whelan – Proxy is SES Chief Officer, Mr Anthony Draheim

The ESA comprises the ACT Ambulance Service, ACT Fire and Rescue, the ACT Rural Fire Service, the ACT State Emergency Service and the ESA Support Services. The ESA plays a key role in helping the Coordination Group understand the impacts of natural disasters on our Region's catchments, specifically in relation to flooding and improving flood management, and in the planning required for and managing of emergency events such as storms and bushfires, which can also have significant environmental impacts.

ACT Health Directorate

Director-General, Rebecca Cross – Proxy is the Executive Branch Manager, Health Protection Service, Mr Victor Martin

In respect to environmental health, the Health Directorate protects and promotes the good health of the ACT community by fostering safe and healthy environments. It provides information, policy development, monitoring and enforcement in relation to public health activities including the Guidelines for Recreational Water Quality. The Directorate guides the Coordination Group's understanding of these issues in relation to water and provides a framework for the management of recreational water sites within the ACT, addressing the specific risks from blue-green algae as well as microbial pathogens.

ACT Chief Minister, Treasury and Economic Development Directorate

Head of Service, Ms Kathy Leigh – Proxy is the Executive Branch Manager, Economic and Regional Policy, Dr David Clapham

The Directorate manages and coordinates intergovernmental forums and the ACT's relationships with other jurisdictions, most significantly with the Australian and NSW governments and surrounding NSW councils. The Directorate assists the Coordination Group's understanding of key inter-jurisdictional issues and particularly the role that water (supply, quality and security) plays in future regional growth and development.

ACT Environment, Planning and Sustainable Development Directorate (EPSDD)

Director-General, Mr Ben Ponton – Proxy is Deputy Director-General, Environment, Water and Emissions Reduction, Mr Geoffrey Rutledge

EPSDD supports the ACT Government's interests in water resource management, environmental protection and conservation, and natural resources. The Directorate has responsibility for strategic water policy development within the urban and natural environments, inter-governmental engagement on national and Murray-Darling Basin water reforms and delivering on the Government's ACT Water Strategy.

Icon Water

Managing Director, Mr Ray Hezkial – Proxy is Principal Advisor, Finance and Strategy, Ms Nicole Vonarx

Icon Water owns and operates the ACT's network of dams for drinking water, water treatment plants, sewage treatment plants, reservoirs, water and sewage pumping stations, mains and other associated infrastructure. It provides water and sewerage services to the ACT and bulk water to Queanbeyan. Icon Water's interests in healthy catchments include the region's security, quality and sustainability of water resources for a range of uses and minimising the impact of its network on the region's waterways. Icon Water provides the Group with considerable insight into the issues associated with the Region's drinking water supply and its quality and security.

National Capital Authority (NCA)

Chief Executive, Ms Sally Barnes – Proxies are Director, Estate Management, Mr Peter Beutel and NCA Lake and Dam Manager, Mr David Wright

The NCA manages many of Canberra's nationally, iconic and culturally significant landscapes and attractions including Lake Burley Griffin and the surrounding lands. It is keen to see national land and water bodies used and enjoyed by visitors and Canberra residents for a range of recreational uses. However, it aims to ensure there is an appropriate balance between public access to national land with the protection of national assets. NCA provide a much-appreciated national perspective to the Group's discussions.

NSW Department of Primary Industries and the Environment (DPE)

Director, Mr Peter Hyde – Proxy is Director, Regional Water Strategies, Southern and Coastal, Ms Kristianne Anderson

NSW DPE - Water represents the NSW Government's interest in the ACT region catchment. The department is responsible for water security and managing NSW water resources, including surface and groundwater management. We also ensure equitable sharing of surface and groundwater resources, and that water entitlements and allocations are secure and tradeable.

The department is working towards delivering on the NSW Government's water goals through planning, policy and regulation and leading negotiations with the Commonwealth, including the Murray-Darling Basin Authority and other jurisdictions.

ACT Transport Canberra and City Services (TCCS) Directorate

Director-General, Ms Alison Playford – Proxy is Executive Group Manager, City Operations, Mr Ken Marshall

TCCS is responsible for managing the ongoing maintenance of Canberra's urban lakes and ponds, including the management of stormwater infrastructure incorporating Gross Pollutant Traps, wetlands and stormwater channels. TCCS is also responsible for providing services to manage the Territory's waste collection and other infrastructure. TCCS bring very practical advice to the Group around the management of water in the urban environment.

Regional local government members

- **Queanbeyan—Palerang Regional Council (QPRC)**
  Chief Executive Officer, Ms Rebecca Ryan
  Proxy is Portfolio General Manager, Community Connection, Mr Phil Hansen.
- **Snowy Monaro Regional Council (SMRC)**
  Chief Operating Officer, Mr Jeff Morgan
  Proxy is Coordinator Strategy Development, Gina McConkey.
- **Yass Valley Council**
  General Manager, Mr Chris Berry
  Proxy is Director, Planning and Environment, Ms Julie Rogers.

The local government areas of QPRC, SMRC and Yass Valley Council make a significant contribution to the management and protection of the region's natural resources.

Local governments undertake a wide range of activities related to catchment management, including the development and implementation of land use planning, managing public land and regulating private activities. They play a key role in translating the policies of the Australian and state governments into local and on-ground projects. As such, their input to the regional strategic planning, economic development and water management is vital to providing the best outcomes for an interjurisdictional catchment.

NSW South East Local Land Services (LLS)

General Manager, Mr Luke Pope – Proxy is Stakeholder and Investment Coordinator, Ms Rebecca Bradley

The South East LLS brings agricultural production advice, biosecurity, natural resource management and emergency management into a single organisation. Its services add value to local industries, enhance natural resources, protect industries from pests and disease and helps communities respond to, and catchments to recover from natural disasters such as floods, fire and droughts. The South East LLS will ensure the natural assets, local industries, landholders and communities of the surrounding tablelands region are represented on the Coordination Group.

Additional Attendees

On a regular basis, and by invitation, significant contributions of knowledge and expertise were shared with, and also supplied to, Coordination Group meetings from:

» **ACT Environment Protection Authority** – Dr Su Wild-River

» **ACT Commissioner for Sustainability and the Environment** – Dr Sophie Lewis.

3. Resourcing

Secretariat services and support are provided for the Coordination Group on an ongoing basis through the Water Policy Unit of EPSDD.

Members of the Coordination Group cover their own staff time from their respective budgets.

Both the Chair's and the Community Representative's positions, being independently appointed, receive honorariums as determined under the Remuneration Tribunal Determination (Determination 13 of 2021). Both positions are funded from the EPSDD budget. For 2021-22, the Chair, Dr Maxine Cooper, received remuneration from this budget.

Activities related to the region's catchment management and improvement are supported through the Coordination Group's interjurisdictional investment and resourcing framework. Coordination Group members provide funds from their respective budgets into the fund, totalling $120,000.00 per annum. Funds are managed within a holding account by EPSDD.

EPSDD provide direct investment into priority activities and resources the function of the Coordination Group through the secretariat and policy support.

» The Coordination Group's financial report for 2021-22 is at **Appendix D**.

4. 2021-2022 Highlights

As noted in section 1.1 of this Annual Report, a key function of the Coordination group is supporting the implementation of the *ACT and Region Catchment Strategy 2016-2046 (the Catchment Strategy)*.

The Catchment Strategy identifies 19 actions that bring government, community and industry together to produce healthy, productive, resilient and liveable catchments. These 19 actions are centred around five themes:

Governance, policy and planning — developing and maintaining a framework for coordination of policy, planning, research and investment.

Communities — acknowledging the outstanding contribution that catchment groups and volunteer programs play in protecting our natural resources, motivating people to connect to their catchment and increasing their capacity to adapt to change.

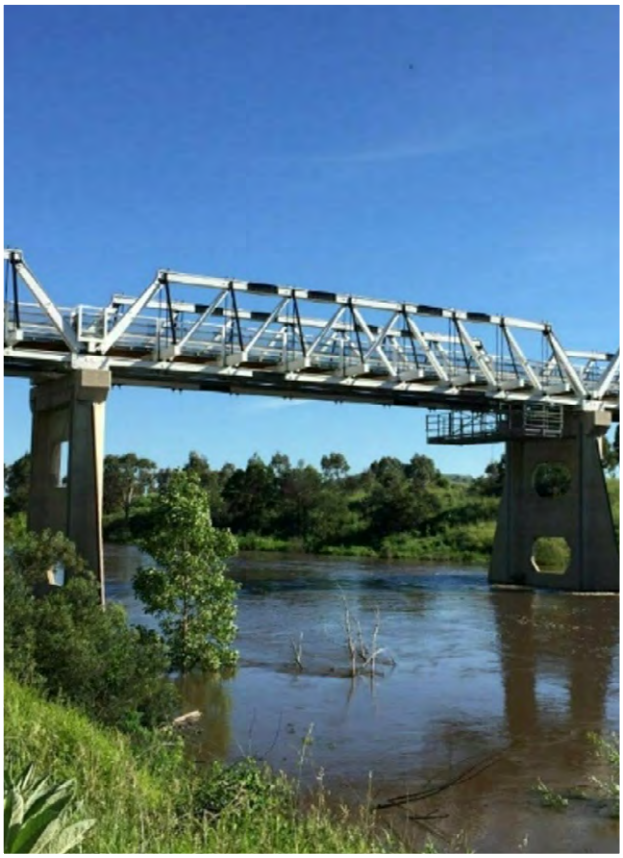
Regional development — recognising that the catchment is a growth area and strategies are needed to support the prosperity of the region with sound catchment management planning principles and technical expertise to support sustainable growth.

Water — putting in place mechanisms to support water security for the ACT and surrounding regions.

Land and biodiversity — supporting biophysical processes that maintain the resilience and health of natural resources that are essential for thriving communities and ecosystems.

A copy of the Catchment Strategy can be found at: environment.act.gov.au/water/water-strategies-and-plans/act-and-region-catchment-strategy.

In 2021-22, Coordination Group members continued to undertake significant work to implement the actions identified by the Catchment Strategy, and if these were not discussed as a specific agenda item, they were able to be mentioned in standing agenda item 'Roundtable'.



4.1 Governance, policy and planning

Theme one of the Catchment Strategy is *governance, policy and planning*. Under this theme, there are six priority actions with the objective that *governance decisions take into take into account the values of stakeholders, the evidence base, and the benefits of cross-jurisdictional collaboration, and are undertaken for the collective, long-term good of the catchment and its residents*. These actions are:

Action 1: Build an inter-jurisdictional decision-making framework related to catchment policy and planning.

Action 2: Establish an inter-jurisdictional investment and resourcing framework.

Action 3: Promote evidence-based decision making for improved healthy catchments.

Action 4: Continue to inform a catchment wide assessment of vulnerability to climate change.

Action 5: Review and align catchment

Action 2 was earmarked as a particular focus for the Coordination Group for 2021-22.

During the period, the Coordination Group established a budget allocation sub-group to advise on how member contributions could be allocated. The sub-group convened its first meeting in May 2022.

In 2022-23 the sub-group will:

» Develop a priority work plan for allocation of member funds.

» Review and establish a new investment and resourcing framework for the Coordination Group, for the next three financial years.

Another key governance activity undertaken during 2021-22 was to update the Coordination Group Charter. The charter spells out the terms of the Coordination Group's responsibilities, membership, and operational arrangements.

In 2021-22 members undertook research work that can be used to inform decision-making for improved healthy catchments.

For example:

› A study examining the trends and drivers of intestinal enterococci levels in the Murrumbidgee, Cotter and Paddy Rivers from 2009 to 2020 was published in the Journal of Water and Health. More information about the study can be found in **Case Study 1** on page 14.

› Coordination Group member Icon Water, in collaboration with the University of Canberra, submitted a paper to OzWater'22 titled 'Balancing Water Security and Fish Conservation in Managing Freshwater Systems'. Further detail about the paper can be found in **Case Study 2** on page 15.

› Icon Water initiated a Water Services Association of Australia project with peer utilities and Griffith University to research and develop an industry paper on how nutrient offsets and trading regimes can deliver environmental outcomes. It is expected that the paper will be completed during 2022-23, with further detail to be provided in the next Coordination Group Annual Report.

Case Study 1: Sources and drivers of intestinal enterococci in the Murrumbidgee River

As well as being an important source of water for the ACT and Regions, the Murrumbidgee River supports recreational activities in the ACT that are classed as 'primary contact'. Primary contact activities involve significant direct contact with water, for example through swimming. During these activities, water is likely to be swallowed or inhaled, or come in contact with ears, nasal passages or cuts in the skin.

ACT Health maintains a monitoring program throughout the designated swimming season (September – April). In line with World Health Organisation recommendations, intestinal enterococci is used as the preferred faecal indicator. Despite water quality generally being high, swimming sites along the Murrumbidgee River are periodically closed to primary contact recreation because of elevated levels of intestinal enterococci being detected. Exposure to water with elevated intestinal enterococci levels may lead to adverse health outcomes such as gastroenteritis, respiratory illnesses, ear infections or skin problems.

A study recently published in the ***Journal of Water and Health*** (Vincent et al. 2022) examined the trends and drivers of intestinal enterococci levels in the Murrumbidgee, Cotter and Paddys Rivers from 2009 to 2020. The study aimed to determine if flow, flow variability and water quality (e.g. turbidity) could be used to predict incidences of high intestinal enterococci levels. The study was a collaboration between ACT Health, EPSDD and the Australian National University. Key findings include:

- Incidences of high intestinal enterococci levels occurred across a wide range of environmental conditions, but the most readily detectable pattern was elevated levels of intestinal enterococci during high flow events, when turbidity (muddiness) was high. This indicates that intestinal enterococci may be entering the waterways in runoff from primarily agricultural land.
- High levels of intestinal enterococci can occur in the Murrumbidgee River during low flow conditions. Under these conditions, livestock are unlikely to be the source of intestinal enterococci. Further data is necessary to understand the causes of increases to intestinal enterococci levels during low flow conditions.

The study highlights that continued collection of data and expansion of the evidence base is critical to ensuring the holistic preservation of our unique water catchment area. This body of work was undertaken by a collaborative group working to promote a whole of government approach to understanding the catchment's historical and current status.

Case Study 2:
Lessons learnt balancing water security and fish conservation a decade on from the Cotter Dam expansion

The University of Canberra and Icon Water submitted a paper to OzWater'22 titled 'Balancing Water Security and Fish Conservation in Managing Freshwater Systems' under the theme of Resilience and Water Security. The paper was presented by Icon Water at the Brisbane Convention and Exhibition Centre in May 2022.

The paper reflected on what was achieved in balancing water security and fish conservation in the Enlarged Cotter Dam, particularly the importance of the collaborative and comprehensive approach to long-term fish management with lessons learnt balancing water security and fish conservation.

The presentation described Icon Water's story, from the Enlarged Cotter Dam's planning and construction to the project's outcomes and all the programs and achievements to conserve native endangered fish since its conception.

The story emphasized the effective collaboration between water utilities, scientists, regulators and land managers to meet modern-day challenges, the production of over 50 academic journal papers, and demonstrated that water utilities can play a significant role in achieving conservation outcomes.

4.2 Communities

Theme two of the Catchment Strategy is communities. Under this theme, there are three actions that Coordination Group members are committed to undertaking with the objective that *the community values and remains strongly connected to the catchment, and has the capacity to quickly adapt to environmental, economic and policy changes*. These actions are:

Action 7: Strategically support the role and work undertaken by peak stakeholder groups, volunteers and land owners and managers.

Action 8: Develop an integrated catchment emergency response plan.

Action 9: Build community understanding about catchment health to promote behaviour change through a broad range of communication and education strategies.

Action 7: was a particular focus for the Coordination Group in 2021-22. As part of this focus, the Group has continued to provide funding to, and work closely with, the UMCN.

UMCN is a not-for-profit organisation that brings together community organisations with an interest in the management of the upper Murrumbidgee catchment. They help to facilitate conversations between these groups on issues such as water security and positive ecological land management techniques. UMCN host events, facilitates conversations between the community, private and government sectors and runs community education campaigns. An overview of the UMCN's activities during 2021-22 are outlined in the UMCN Annual Report at **Appendix A.**

The Coordination Group includes a Community Representative, Ms Karissa Preuss. Ms Preuss actively contributes to discussions about the role and work undertaken by peak stakeholder groups, volunteers, community groups, property owners and land managers in maintaining and improving the region's catchments and waterways. Ms Preuss' community representative annual report can be found at **Appendix B**.

The award-winning ACT Healthy Waterways partnership continued with gusto this year. The partnership is a joint initiative between ACT Catchment Groups and the ACT Government that was developed to improve the quality of water entering our lakes and waterways. More information on the Healthy Waterways partnership can be found at **Case Study 3** on page 17.

One of the flagship programs being run through the Healthy Waterways partnership is the H2OK education program, which received financial support from EPSDD during 2021-22. "Only rain down the stormwater drain" is the take home message of the program, which is aimed at improving the health of Canberra's urban waterways. A highlight of the H2OK program this year was The Leaf Collective, a series of education activities and incentives to reduce leaf litter going down stormwater drains. You can find more information about The Leaf Collective in **Case Study 4** on page 18.

UMCN member, the Australian River Restoration Centre (ARRC) has undertaken a range of activities during the year to increase awareness of the declining health of the Upper Murrumbidgee River, including hosting a community meeting and developing a new website called The Forgotten River. Further information about the ARRC's work in this space can be found at **Case Study 5** on page 19.

Icon Water has been undertaking a community engagement program, Let's Talk Water and Wastewater, to understand Canberrans priorities and views on issues such as water security, pricing and affordability. Further information about the program can be found in **Case Study 6** on page 20.

During 2021-22, several community organisations received funding to undertake education and land care programs as a result of EPA Enforceable Undertakings. See **Case Study 7** on page 22 and **Case Study 8** on page 24 for more details.

Case Study 3:
ACT Healthy Waterways Partnership

Debbie Paton's competition-winning artwork selected by public vote at the ACT Healthy Waterways wetland at Eyre St Kingston.

The ACT Healthy Waterways partnership is a joint initiative between the Southern ACT Catchment Group, Molonglo Conservation Group, Ginninderra Catchment Group and the ACT Government. The partnership was developed to improve the quality of water entering our lakes and waterways and flowing downstream into the Murrumbidgee River. It provides community education about causes of stormwater pollution, how recently built water quality assets including wetlands, ponds and rain gardens filter pollution, and why the actions of residents are critical to improving water quality. Key outcomes of the program so far include:

- **Community stewardship** - Twenty new wetlands, ponds and raingardens were developed as part of the Healthy Waterways. The partnership has supported Landcare groups (now over 70 across the ACT) who volunteer their time and energy to care for natural spaces in ACT catchments.
- **Stormwater Literacy** - all project partners undertook a program to educate the Canberra community about what stormwater is, where it flows to and what pollutes it. In the first year of the partnership this was achieved through 20 public events, engagement with schools, over 100 communications pieces, and educational stencils painted on hundreds of stormwater drain covers.
- **Behaviour change** - was another key part of the project to address leaf litter in road gutters, which is one contributor of the nutrient pollution pouring into our waterways. Further information about the Partnership's behaviour change program The Leaf Collective can be found in **Case Study 4** on page 18.

The 'walk-n-talk' events organized by the Catchment Groups introduced local residents to their new waterway assets and assisted recruitment of community leaders and volunteers to form stewardship groups. Through this coordinated approach, local residents around most of the large ACT Healthy Waterways sites have had an opportunity to learn more about the purpose, structure and function of the sites.

Over 33 other community groups have engaged in one or more of the partnership's key projects, as well as businesses, business associations, schools and ACT Government agencies. Community members have hosted educational events, joined planting or clean-up events, participated in Leaf Collective activities, or formed new stewardship groups to do regular landcare activities at new constructed wetlands, ponds and raingardens.

The partnership has recently been recognised as a finalist in the 2022 National Landcare Awards.

Case Study 4:
The Leaf Collective

Members of Sea Change Tuggeranong volunteering at a pop-up Leaf Collective drop-off point

Research in the Lake Tuggeranong Catchment shows that five times the amount of nutrient pollution needed for a blue-green algal bloom enters the lake annually, and that it comes from stormwater drains right across the urban catchment. One of the ubiquitous sources of nutrients is leaf litter from the growing, and needed, urban forest – from both native and introduced tree species.

The Leaf Collective program came out of a co-design process funded by ACT Government and run by Griffith University in 2021 with Canberra householders and other stakeholders. Following a successful pilot campaign focused on autumn leaves in the autumn of 2021, a second pilot was designed and tested in summer of 2022, focusing on eucalyptus leaf litter. Both pilot programs included around five postcodes and 11,000 households.

The Leaf Collective program includes multiple elements, such as:

- Give-aways of sturdy, reusable bags to help people collect, move and store leaf litter more easily.
- Discounted compost equipment from project partner, the Compost Revolution.
- An Adopt-a-Tree-or-Drain project to gather public commitments and display them on a live map.
- A citizen science app that collects estimates of volumes of leaves diverted from areas near stormwater drains and displays collective results here: https://arcg.is/0ezizj.
- Pop-up locations to drop off leaf litter closer to home.
- Educational videos and articles about the science of the connection between leaf litter and blue-green algae.
- Educational content about composting, including busting myths about eucalyptus leaves not being good for compost or mulch – they can be used for both.
- Six-week publicity campaigns to tell households about the ways to participate and incentives offered.

Case Study 5:
Working together to recover the Upper Murrumbidgee River

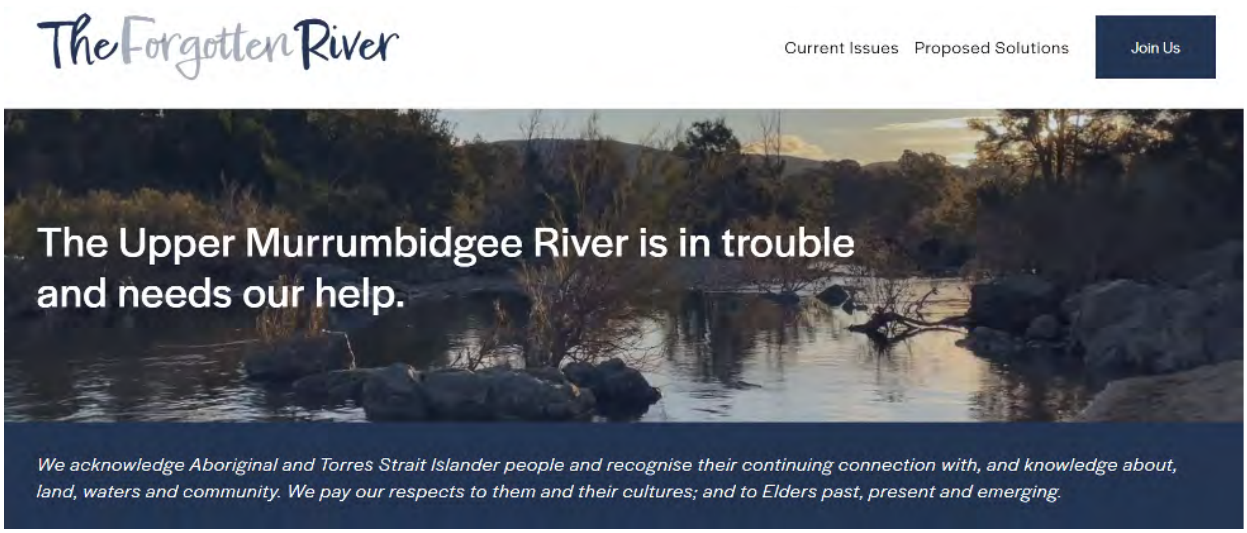
The Australian River Restoration Centre (ARRC) has been working with the ACT Government, the ACT and Region Catchment Management Coordination Group and a range of other agencies to increase awareness of the declining health of the Upper Murrumbidgee River.

In April 2022, the ARRC convened a meeting of concerned community members to discuss the current poor state of the Upper Murrumbidgee River – including a lack of water in dryer years – and identify avenues to improve flows. The river ceasing to flow in 2019 is seen by many as the catalyst for change, with that event highlighting the legislative and policy issues in relation to water management in this part of the Murray Darling Basin.

This work builds on issues raised at the Fish and Flows Forum held by the Upper Murrumbidgee Demonstration Reach Program in June 2021, which showed how the current flow regime and operating rules are posing a threat to local populations of aquatic fauna, including one of the few remaining populations of the threatened Macquarie Perch. It also highlights issues identified at the regional Water Quality and Security Forum hosted by the Upper Murrumbidgee Catchment network in 2022, and raised by the EPSDD in their Basin Annual reporting, which show how the current legislative and policy environment is a risk to critical water needs of the region, including the ACT.

To help raise awareness, the ARRC has developed a new website called The Forgotten River, to reflect that the river has been left behind by water management reforms. The website aims to show how the current operating rules and complex management arrangements are seeing the continued demise of river health. With the river ceasing to flow in 2019, this campaign highlights concerns for regional water security and seeks community support for a review of management arrangements.

The ARRC is also sharing the message that although there is a lot of rain at the moment and our rivers are running high, this is the perfect time to have these conversations so we are better prepared for the next drought.



Case Study 6:
Let's Talk Water and Wastewater

Icon Water's vision is to be a valued partner in the community. They strive for ongoing dialogue with their customers and for these conversations to translate into meaningful outcomes for the ACT community.

It was clear from previous research and more recent engagement with the ACT community that there is enormous value placed on water security and water conservation. Icon Water were eager to have in-depth and complex conversations to inform their future strategic direction.

Over the past 18 months Icon Water built on past research to create deeper connections with their customers, stakeholders and the ACT community as part of the Let's Talk Water and Wastewater engagement program. Icon Water engaged with more than 17,500 Canberrans, including customers, community groups, industry and an expert panel of recognised academics from various ACT based universities and federal government departments. The engagement program spanned short term decisions as well as beginning some long-term conversations that will continue over many years on topics such as water security and alternative supply options, liveability and sustainability.

Through these activities Icon Water explored a wide range of topics, including priorities for water security, service standards and customer experience, pricing, affordability and sustainability. What Icon Water heard from the ACT community on these topics has shaped the price proposal for the 2023–28 regulatory period.

It was also clear that the community considers Icon Water an essential service provider, and that to be a value partner in the community customers want Icon Water to be more visible – this means being targeted in partnering initiatives, education and supporting activities, and proactively talking about the Icon Water business with the community.

In June 2022, Icon Water submitted their 2023–2028 price proposal to independent economic regulator, who are responsible for reviewing Icon Water's services and price setting. The 2023–28 price proposal outlines Icon Water's priorities and the resources that are needed to provide Canberra with clean, safe drinking water and reliable wastewater services for the next five years.

Infographic 1. What was heard by Icon Water

Case Study 7:
Enforceable Undertaking to fund work by Ginninderra Catchment Group

Scouts ACT Event

Background

In 2020, the EPA was advised by Ampol Petroleum Pty Ltd (formerly Caltex) that losses had been identified from an underground fuel storage tank and had entered the environment. The EPA issued an Environment Protection Order requiring action to manage the risk of contamination both on and off-site. An Audit and Management Plan was completed and the leak was deemed to have caused serious environmental harm.

The ACT Environment Protection Act provides for Enforceable Undertakings, which are legally binding agreements between the EPA and a party alleged to have breached environmental legislation. They are designed to achieve improved environmental outcomes, which need not be directly related to an alleged breach. On 12 May 2021 the EPA accepted an Enforceable Environmental Undertaking from Ampol to contribute $200,000 towards specified projects including $50,000 allocated to the Ginninderra Catchment Group.

Outcomes

In 2022, the Ginninderra Catchment Group reported the following outcomes from this investment:

- Increased waterway and catchment environment knowledge.
- Encouragement of positive behaviour change with young people.
- Increased youth stewardship of urban waterways and reserves through Landcare.
- Improved catchment area.
- Engagement with local citizen science projects and community groups.

4.3 Regional Development

Theme three of the Catchment Strategy is *regional development*. Under this theme, there are two actions that Coordination Group members are committed to undertaking with the objective that *human development across the ACT and region is resilient and sustainable*. These actions are:

Action 10: Provide an integrated catchment management planning approach for growth and settlement patterns in the ACT and Region.

Action 11: Develop regional capacity to implement and manage sustainable water infrastructure.

Discussion of NSW Regional Water Strategies was a significant agenda item for the Coordination Group meeting on 30 March 2022. The NSW DPE presented to the Coordination Group on these Strategies, including the Murrumbidgee regional water strategy and Murrumbidgee unregulated water sharing plan. NSW DPE also provided information about the water rights and obligations of Snowy Hydro Ltd.

On 31 March 2022, Icon Water and the Water Services Association of Australia led a Coordination Group discussion about supply options for diversified water supply including purified recycled water in inland settings. Most Australian communities are reliant on surface water but this can lead to water shortages in dry years. Looking at alternative water supply options, particularly for inland, regional communities, is an important element of future water security for these areas.

The Coordination Group continues to engage with a variety of government and non-government organisations that are working to preserve catchment health in the ACT and Regions, and develop regional responses to threats to catchment health. One of these organisations is the EPA, who have regularly attended Coordination Group meetings in 2021-22. **Case Study 7** at page 21 and **Case Study 8** on page 23, provide a good example of the impact of the EPA's work.

Case Study 8: Enforceable Undertaking to fund work by Ginninderry Conservation Trust

Releasing 200 Murray Cod fingerlings into the Triangle Dam

Background

In 2020, the ACT EPA was advised by Ampol Petroleum Pty Ltd (formerly Caltex) that losses had been identified from an underground fuel storage tank and had entered the environment. The EPA issued an Environment Protection Order requiring action to manage the risk of contamination both on and off-site. An Audit and Management Plan was completed and the leak was deemed to have caused serious environmental harm.

The ACT Environment Protection Act provides for Enforceable Undertakings, which are legally binding agreements between the EPA and a party alleged to have breached environmental legislation. They are designed to achieve improved environmental outcomes, which need not be directly related to an alleged breach. On 12 May 2021 the EPA accepted an Enforceable Environmental Undertaking from Ampol to contribute $200,000 towards specified projects including $150,000 allocated to the Ginninderry Conservation Trust.

The Leaky Dam (photo credit GCT)

Outcomes

In 2022, the Ginninderry Conservation Trust reported the following outcomes:

- Improved knowledge and understanding of farm dam restoration and capabilities within Conservation Trust capability.
- Collection of baseline data showing current environmental conditions at the dams, to compare with future data to see improvements.
- Improved fish populations in farm dams targeted for restoration works.
- Data has been gathered to facilitate targeted restoration activities and engage local residents in citizen science projects.
- Data has been obtained to identify stream stability issues, invasive species incursions, changes in cover and species diversity to facilitate targeted restoration.
- A database of volunteers has been developed, including relevant skills and training.
- Improved habitat has been achieved via control of a weed of national significance and declared pest plants.
- Better understanding of the water health of the Murrumbidgee River has been gained.

4.4 Water

Theme four of the Catchment Strategy is water. Under this theme, there are four actions that Coordination Group members are committed to undertaking with the objective that *water is managed in a total water cycle management regime*. These actions are:

Action 12: Secure long term water supplies for the ACT and Region.

Action 13: Improve water quality, protect and restore aquatic ecosystem health and reduce nutrient, sediment and pathogen loads at key sites across the catchment.

Action 14: Ensure Indigenous and other values are recognised.

Action 15: Develop a better understanding of groundwater resources (quantity and quality) within the region.

Action 12 and action 14 were particular areas of focus for the Coordination Group in 2021-22.

A significant item on the Coordination Group's agenda during the year was the upgrading of the QSTP. Information about the proposed upgrades is included in **Case Study 9** on page 25. Throughout the year, QPRC and Hunter H2O (the engineering firm guiding the proposed upgrade) discussed with Coordination Group members opportunities and risks associated with the upgrades. The Coordination Group arranged for Minister Rattenbury to attend their August 2021 meeting to receive a status update on the QSTP upgrade. The Coordination Group also facilitated input from water quality experts such as Professor Fiona Dyer from the University of Canberra who presented at the Group's August 2021 meeting on the relationship between phosphorous and algal bloom in Lake Burley Griffin.

Following the August 2021 meeting, the Coordination Group committed to providing Minister Rattenbury with advice and considerations regarding managing discharge from the proposed upgraded QSTP and water quality in Lake Burley Griffin. After careful consideration and lengthy discussions by Coordination Group members, this advice was provided to Minister Rattenbury in March 2022. Minister Rattenbury expressed his appreciation for this advice in a response letter in July 2022.

In February 2022, the Coordination Group provided a submission to the Natural Resource Commission's review of the impact the Water Sharing Plan to the Murrumbidgee Unregulated River Water Sources 2021. A copy of the submission is at **Appendix C.** A representative from the Natural Resource Commission attended the Coordination Group's meeting on 30 March 2022 to discuss the submission and provide further information about the review.

In June 2022, Dr Sophie Lewis, ACT Commissioner for Sustainability and Environment, presented the investigation report on the state of ACT Lakes and Waterways to Coordination Group members. The report provides 12 recommendations to the ACT Government to improve water quality management of urban lakes and waterways.

Another significant focus for 2021-22 was facilitating the addition of First Nations representatives to the Coordination Group's membership. The Dhawura Ngunnawal Caring for Country Committee has nominated two Traditional Custodians to be included in the Coordination Group. As the Group's membership is decided by the Minister, the names of the Traditional Custodians will be provided to the Minister via EPSDD.

Case Study 9: Queanbeyan Sewage Treatment Plant upgrade

The QSTP has been treating sewage from Queanbeyan before discharging it into the Molonglo River since its construction in the mid-1930s. While QPRC has delivered multiple upgrades and regular maintenance works since, the facility is no longer fit-for-purpose. QPRC is undertaking a significant upgrade project to replace the existing treatment plant with a modern facility on the same site.

The existing plant has a design capacity of 34,500 equivalent persons (EP) and is currently operating above this capacity, servicing an estimated 52,000 EP. The QSTP currently services the NSW neighbourhoods of Crestwood, Jerrabomberra, Karabar, Queanbeyan, Queanbeyan East, Queanbeyan West, and Greenleigh, and the ACT suburb of Oaks Estate. Additional capacity is required for current and future population growth, including the development of South Jerrabomberra. Master planning and concept designs for the upgraded plant have prioritised capacity for 75,000 EP.

Upgrades to the QSTP are also required to address issues with structural failure, equipment obsolescence, and work health and safety. The existing facility no longer conforms to industry best practice for the protection of public health or the environment and is becoming increasingly difficult to operate to meet licence conditions.

The upgraded QSTP is being designed using the Infrastructure Sustainability Council framework to achieve design and as-built ratings of 'Excellent' through innovation, energy and water efficiency, materials and waste management considerations. The treatment plant will be powered by 100% renewable energy and will include climate change adaptation measures, such as backup power generators to enable full service to be maintained in the event of mains power supply loss during floods, storms or bushfires.

The proposed tertiary treatment process for the new plant will produce a high quality of effluent. Recycled water from the process will initially be used onsite and will also be provided for offsite applications such as dust suppression. The plant will be 'recycled water ready' and with some further capital work could supply a larger scale recycled water scheme.

Key design features to improve water quality outcomes in the Molonglo River include storm flow treatment measures allowing treatment up to 5.5 average dry weather flow, phosphorus removal measures including biological and chemical phosphorus removal with ferric and lime dosing, and dissolved air floatation filters, and the operational flexibility to enable low nitrogen effluent if required.

The project is currently being assessed through the ACT Government Impact Track approvals pathway and is at the revised Environmental Impact Statement (EIS) stage. As part of the EIS, QPRC prepared a hydrodynamic model of Lake Burley Griffin to understand the impacts of the proposed upgraded QSTP effluent on the lake and to allow for QPRC to mitigate against the impacts.

The project will decommission and remove the existing maturation ponds and landscape this area to create a well vegetated riparian community. The landscaping plan for the decommissioned maturation ponds has been prepared with community and stakeholder involvement.

Subject to Queanbeyan receiving the appropriate statutory approvals the project could commence in 2023-24 with construction to take approximately 2 years.

4.5 Land and Biodiversity

Theme five of the Catchment Strategy is land and biodiversity. Under this theme, there are four actions that Coordination Group members are committed to undertaking with the objective that *the ACT and Region is a healthy ecological system that is resilient to stress and adaptive to change.* These actions are:

Action 16: Implement an approach to biosecurity planning and risk management.

Action 17: Develop a regional approach to strategic land and biodiversity management practices.

Action 18: Mitigate soil erosion at priority sites.

Action 19: Consider regional approaches to dealing with contaminated land, illegal dumping of contaminated waste and dumping of sub-soil construction waste.

While not identified as a target area for the Coordination Group in 2021-22, members continue to work to support health ecological systems across the ACT and Region. In 2021-22, for example, Coordination Group member TCCS (via Roads ACT) undertook an audit of all gross pollutant traps in the ACT network to ensure they were effectively trapping leaves, litter, coarse sediment and other solid waste before it reaches the Murrumbidgee River. As part of the audit, locations impacted by erosion were identified and appropriate rectification actions are being taken. More information can be found in **Case Study 10** on page 27.

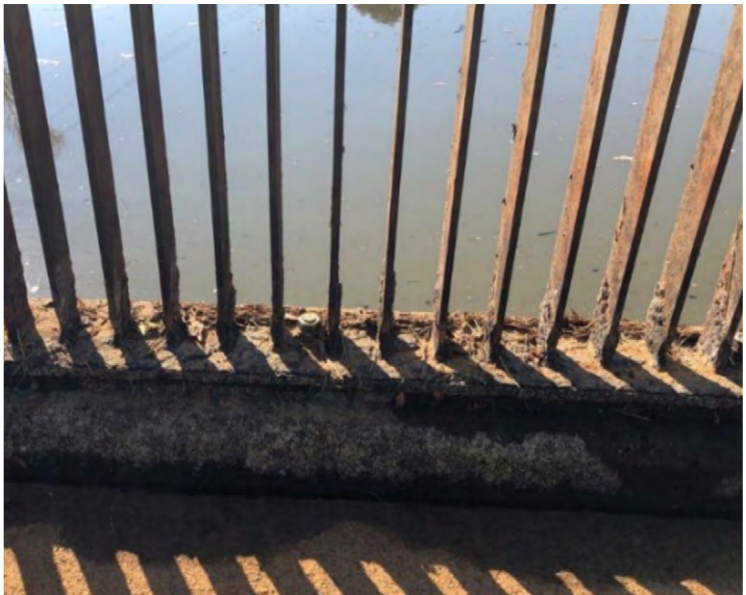
Picture (below) of embankment erosion identified as a result of GPT audit

Case Study 10: Gross pollutant trap audit

Background

Roads ACT (part of the TCCS Directorate) owns, operates and maintains Canberra's urban stormwater network. This includes sumps, stormwater pipes, stormwater channels, water quality pond embankments, biofiltration structures, cut off drains, retarding basins, gross pollutant traps (GPTs), dams and weirs.

Urban development significantly increases the area of impervious surfaces from which rainfall quickly runs off. These surfaces include building roofs, paved areas, roads and car parks. As stormwater runoff flows over the landscape it collects pollutants. The stormwater network in the ACT incorporates various pollution control systems intended to remove pollution from water before it flows into the Murrumbidgee River. To reduce the number of pollutants entering downstream receiving waters, the Territory started building GTPs in the 1970s and now has over 267 such structures. The GPT structures are designed to trap solid waste like leaves, litter and coarse sediment for removal from the stormwater network.



GPT Audit

Roads ACT engaged a consultant to undertake a site-specific audit of all GPT assets with particular focus on their effectiveness, pollution retention, ease of cleaning, overall public and maintenance personnel safety, maintenance access, suitability of design, maintenance methods and maintenance frequency. The audit also identified opportunities for cost effective upgrades that would improve performance, reduce long-term maintenance costs, improve water quality outcomes and increase social amenity and environmental enhancement. The Audit was carried out in stages and was completed in February 2022.

Roads ACT started implementing audit recommendations during the first half of 2022 and is currently in the process of establishing contracts to implement other audit recommendations.

Recommendations of the GPT related to:

1. Improving minor and major vehicular access and hard stand surfaces to allow more efficient and thorough maintenance.
2. Making minor and major improvements to reduce soil erosion at GPT sites.
3. Ensuring all sediment and vegetation build-up on exclusion bars, trash racks and within GPT structures are removed as part of general maintenance actions to increase efficiency of the GPT.
4. Making minor and major structural remedial actions to increase the longevity of the GPT structures, for example, repair of concrete spalling and corrosion of racks.
5. Making minor and major modifications to improve overall efficiency, self-cleaning of racks, pollution capture and retention of GPT structures. Recommended modifications include installation of larger racks to capture more pollution, modifications to placement and orientation of racks for greater efficiency, modification of low flow bypass to avoid permanent low flow bypass.

5. 2022–2023 Priorities

In 2022–23 the Coodination Group will further progress all actions in the *ACT and Region Catchment Management Catchment Strategy 2016-2046*, with an emphasis on the following priorities:

Action 2: Establish an inter-jurisdictional investment and resourcing framework.

The Coordination Group will review the inter-jurisdictional investment and resourcing framework that guides members voluntary contributions. This will be the first review since the framework was agreed in 2018. A budget sub-group was established in 2021-22 to advise the Catchment Group on budget allocation.

Action 4: Continue to inform a catchment wide assessment of vulnerability to climate change.

Understanding the exacerbated threat of climate change on catchments, the Coordination Group will work with EPSDD to conduct a Vulnerability Assessment of water security. The assessment will include indicators relating to water supply, water quality, environmental and socio-economic. The project will provide an analytical tool for assessing the drivers of water security vulnerability and informing adaptation planning for climate change. This work will complement water planning being conducted by NSW in developing their Regional Water Strategy for the Murrumbidgee.

Action 7: Strategically support the role and work undertaken by peak stakeholder groups, volunteers, landowners and managers.

The Coordination Group will focus efforts on ensuring sustainable and ongoing support is provided to peak stakeholder groups, volunteers, landowners, and managers in protecting the ACT region's catchments and water health. The Coordination Group will continue to advocate for support on behalf of these groups and identify potential funding sources. The Coordination Group financially supports the UMCN, however, on-going funding is dependent on the Coordination Group member's voluntary contributions.

COVID-19 restrictions delayed the roll-out of a small grants program that was scheduled to occur in 2019-20 but was rescheduled for 2020-21. Again, this program has not been rolled out due to ongoing COVID-19 constraints. The issue of whether or not the small grant program progresses or the funds are redirected to meet other priorities will be considered by the Coordination Group in 2022-23.

Action 9: Build community understanding about catchment health to promote behaviour change through a broad range of communication and education strategies.

This action is often undertaken as part of other actions. However, for 2022-23 it is included as a priority to give it emphasis. The case studies in the Annual Report are designed to build community understanding.

Action 10: Provide an integrated catchment planning approach for growth and settlement patterns in the ACT and Region.

The South East Tablelands Regional Plan 2036 is to be reviewed and updated in 2022-23 so that it guides regional planning actions to 2041. This plan reflects a collaborative approach that integrates and aligns with the strategic planning of the ACT and NSW. It provides a framework for having a 'borderless region' which is critically important in catchment management. The Coordination Group will seek to reinforce the importance of taking a catchment-wide approach and identify ways for strengthening such an approach that can be included in the updated plan.

Action 12: Secure long-term water supplies (and provide water security) for the ACT and region.

The Coordination Group will maintain efforts to monitor and advance actions to secure the ACT region's long-term water security for the environment and human use.

The Vulnerability Analysis noted at Action 4 will provide an important line of evidence to inform planning for securing the long-term water security for the ACT and region. This analysis will support the EPSDD mid-term review and guide a refresh of the ACT Water Strategy.

Efforts of the Coordination Group to shape water planning policies and initiatives to foster healthy regional waterways will continue, especially in relation to the Murrumbidgee River.

Action 14: Ensure Indigenous and other values are recognised.

The Coordination Group has received nominations from the Dhawura Ngunnawal Caring for Country Committee for Traditional Custodian members for the Coordination Group. Their nominations will be submitted to the Minister for consideration. Hence, the Coordination Group is, and will continue to investigate ways to incorporate Aboriginal perspectives in water management and biodiversity enhancement in the region.

EPSDD has recently commenced a project to conduct Aboriginal Waterway Assessments (AWAs) within the ACT and region. The AWAs will be facilitated by the Ngunnawal Traditional Custodians with the aim of collecting information on cultural values and uses that could be used to inform water policy and planning. Six AWAs are being planned for 2022-23. The Coordination Group will be invited to advise on the strategic site selection for the AWAs with Ngunnawal nominated representatives

Coordination Group functions and governance

The Coordination Group agreed to implement a number of the recommendations of the independent review of the functions and operations of the Coordination Group. Outstanding recommendation items that will be pursued as part of progressing Action 9 in 2022-23 includes considering avenues for proactive promotion of the role of the Coordination Group and its achievements to increase awareness and effectiveness of the Coordination Group's initiatives.

The Coordination Group is aware that two of its policy documents need updating; *ACT and Region Catchment Strategy 2016-2046* and *2016 – 2021* Catchment Management Implementation Plan. While updating these has been flagged in previous Annual Reports, this now needs to be timed so that consideration can be given to including information from reviews underway, or likely to commence in 2022-23, of water planning policies and regional planning being undertaken by NSW and the ACT Governments.

The ACT and Region Catchment Post Emergency Recovery Plan (2018) will be examined in 2022-23 to determine if it needs amending. The ACT Emergency Services Agency, who is a member of the Coordination Group, is well placed to help guide such an examination.

Appendix A – Upper Murrumbidgee Catchment Network Annual Report

The UMCN continued to go from strength to strength. Our growing membership bas (27 financial members 2021-2022) reflects the growing reputation of UMCN as the go-to organisation for everything natural resources management in the region. More than ever, UMCN is connecting practitioners to share knowledge, network and collaborate to gain the best environmental outcomes for the ACT region.

The organisation continues to demonstrate resilience to disruptions caused by COVID-19. UMCN has taken the opportunity to explore and expand into flexible networking modes, with online meetings becoming the norm. We have also taken "the pause" as an opportunity to reflect on the role of UMCN in the region. To this end we have continued high level discussions around the strategic role of UMCN, including investing in a brand story video to raise the organisation's profile.

We have also continued to promote topics aligned to the ACT and Region Catchment Strategy: water, land and biodiversity, communities, governance, policy and planning, and sustainable development.

UMCN General Meeting 18 May 2022, MDBA Community Engagement

Water

UMCN has undertaken a number of actions to address the issue of managing water in the region, with a focus on cross-jurisdictional coordination. The 2022 Year of Water was launched with an infographic, created in consultation with the membership, highlighting water issues in the Upper Murrumbidgee catchment.

Members attended the NSW Government's Regional Water Strategy workshop in Queanbeyan on 18 May 2022. In response, a written submission was lodged, in coordination with other like-minded member groups.

Ongoing communications with the Murry Darling Basin Authority led to a presentation at the general meeting in May to share information about community engagement with the membership.

On 9 March 2022 we also held a Water Quality and Security online forum to discuss what is needed to ensure best practice management of water in the Upper Murrumbidgee Catchment.

Visibility within the busy landscape of natural resource management in the ACT Region is challenging but vital for UMCN to be an effective networking hub. To maintain our profile and interest and to increase accessibility, all meeting and forum presentations, submissions, infographics can be found on the UMCN news page. These resources serve to increase knowledge sharing, raise profile and are an archive of UMCN impact.

John Ive inspecting pastoral land at his property "Talaheni".

Tour of Talaheni

One of the UMCN's greatest successes in the face of COVID-19 restrictions was the presentation of a virtual Tour of Talaheni at an online General Meeting on 10 November 2021. The tour of John Ive's property was a great opportunity for this award-winning farmer to share his knowledge around managing pastoral land for the best ecological and economical outcomes.

The tour focussed on building resilience in the land to manage soil acidity, erosion, salinity and maintain groundwater quality and levels. The tour was well received, and views of the video recording demonstrates the growing reach of UMCN events with 167 views to date.

Cool Burn with Wally Bell

UMCN collaborated with Icon Water and Wally Bell to hold a cool burn event on 6 July 2022.

This event helped to fill knowledge gaps around cultural land management with a focus on improving ecological outcomes. The day was a great success with many local landholders, catchment groups, environmental NGOs, government groups and corporate members experiencing hands-on learning around managing land using fire.

The video story of the day has also extended the reach of this knowledge exchange with a total of almost 200 views on the UMCN YouTube channel to date.

Participants learning from local indigenous knowledge holder, Wally Bell, about managing land using a low-level fire "cool burn".

Appendix B – Independent community representative report

Community members and the organisations and networks that support them have continued to contribute significantly to catchment management in the ACT region during the 2020-2021 financial year.

During this period, the ACT Commissioner for Sustainability and the Environment produced a report on environmental volunteering in the ACT, further highlighting the community as a critical partner in catchment management in the ACT. Environmental volunteers were shown to contribute in ways that are "vast and varied, including removing weeds and planting trees, collecting data on health of waterways and native species, caring for injured wildlife and running the organisations that underpin these activities". This report showed that it would cost over $21.5 million each year if the ACT's environmental volunteers were paid for the work they do. Involvement in environmental volunteering is also good for the individuals and communities involved and the report calculated that environmental volunteering in the ACT saves over $13 million per year in avoided healthcare costs. For more information see https://envcomm.act.gov.au/latest-from-us/act-environmental-volunteers-report/.

The Upper Murrumbidgee Catchment Network (UMCN) continued as a cross-jurisdictional network, providing opportunities for knowledge sharing and collaboration between individuals and natural resource management organisations in the Upper Murrumbidgee catchment. UMCN continued as a conduit of information between community organisations and the Group under the guidance of new Chair, Michael Wrathall, an experienced Senior Executive in the Commonwealth Environmental Water Office and NSW Government. The UMCN held workshops on topics aligned to the ACTRCMCG strategy: water, land and biodiversity, communities, governance, policy and planning, and sustainable development, further detailed in the UMCN Annual Report.

Landcare ACT, working with the three Catchment Groups (Ginninderra Catchment Group, Southern ACT Catchment Group and Molonglo Conservation Group) have continued to represent and support the over 70 Landcare groups and thousands of volunteers who are maintaining and improving catchment health in the region. The three Catchment Groups also implemented healthy waterways behaviour change programs with the broader catchment communities, funded by ACT Government, as shown in **Case Study 4** on page 18. Landcare ACT launched a Wellbeing through Nature program, preliminary evaluation indicates that it is diversifying the pool of landcare volunteers and improving the mental health and social connectedness of ACT residents.

Key issues the community representative raised with the Group from the community during this period include:

'Illegal fill dumping' - Community members again raised the issue of illegal building waste being moved from ACT developments into neighbouring NSW. The Group advised that their issues have been conveyed to the Cross Border Illegal Waste Dumping Steering Committee via Mr Clapham; and advised community members that they can bring issues to the attention of the Cross Border Illegal Waste Dumping Steering Committee via Mr Clapham or Mr Berry. Dr Su-Wild River has offered to be involved in her new role with the EPA.

Water security - Despite the wet year, water security continued to be an issue for the Community and UMCN launched 2022 as the UMCN Year of Water. More information about this work is in their annual report.

Urban Rivers - Landcare ACT received a Federal Labour pre-election commitment of $2.7 million over 3.5 years to lead a project focussed on engaging a diverse catchment community to improve and maintain urban waterways of the ACT. Led by Landcare ACT, in partnership with well-established Catchment Groups, this project will 1) enable community-driven on ground waterway restoration activities including revegetation, weed control, and water flow management in priority locations, 2) support Ngunnawal and other Aboriginal people in caring for waterways, 3) engage youth, including pre-school to young adults in waterways restoration, 4) diversify and grow the existing volunteer community environmental groups stewarding local catchments.

"The Forgotten River" - The River Restoration Centre is leading a consortium focusing on addressing the poor state of the Upper Murrumbidgee River. The Group has created a website that shows negative consequences of the current legislative framework on the biodiversity, water quality and security, and cultural and recreation values of the Upper Murrumbidgee. The Group is calling for better governance, transparency and accountability and management to improve the current situation. For more information see https://theforgottenriver.au/.

The Murrumbidgee River dried to pools.

Appendix C – Coordination Group submission to the Natural Resource Commission on the Water Sharing Plan for the Murrumbidgee Unregulated River Water Sources 2012

Background

The Australian Capital Territory (ACT) and Region Catchment Management Coordination Group (the Coordination Group) welcomes the opportunity to provide a submission to support the review of the Water Sharing Plan for the Murrumbidgee Unregulated Water Sources 2012 (the WSP).

The Coordination Group is established under the ACT Water Resources Act 2007 to facilitate improved governance and coordination of water catchment activities within the ACT and the surrounding region. The ACT and Region Catchment Strategy: 2016-46 guides the priority actions for the Coordination Group, recognising the shared environmental, economic, social and cultural benefits from regional collaboration on water resource management issues. Membership of the Coordination Group includes representatives from the ACT Government, the National Capital Authority, the New South Wales (NSW) Department of Planning, Industry and Environment, the Queanbeyan-Palerang Regional Council, the Yass Valley Council, the Snowy-Monaro Regional Council, South-East Local Land Services, Icon Water and community. The Coordination Group supports the Upper Murrumbidgee Coordination Network (UMCN), which facilitates knowledge sharing and identifies issues for consideration by the Coordination Group. The UMCN connects a diverse range of community members, experts and operational managers for the Upper Murrumbidgee catchment above Burrinjuck Dam.

Water is managed in the ACT under the ACT Water Resources Act 2007. The Act and subordinate instruments set conservative limits on water take from within the ACT designated watercourses. All water in the ACT, including Murrumbidgee River inflows entering the ACT, are subject to the ACT Environmental Flow Guidelines, which aim to protect base flow and limit average water take to 10% of the flow above the protected base flow.

The upper Murrumbidgee catchment provides run-of-river water supply for Cooma and Tharwa, as well as Canberra and Queanbeyan, both directly and via the Murrumbidgee to Googong transfer pipeline. Regional development in the ACT-NSW border region is increasing demand for water supply, with the Murrumbidgee River regarded as a key water source for burgeoning townships such as Michelago.

While the Murrumbidgee River is classified as unregulated under the NSW WSP, it is a system that is impacted by flow regulation, with resultant environmental, social and cultural impacts.

This submission highlights information of relevance to the evaluation of the WSP. In particular, the information and recommendations/ suggested actions relate to the “Unregulated Murrumbidgee above Burrinjuck Dam Extraction Management Unit” (hereafter simplified as the upper Murrumbidgee River), and specifically the Murrumbidgee I, Murrumbidgee II and Tantangara water sources.

This submission is structured as:

1. Evaluating the effectiveness of the Water Sharing Plan, and;
2. Recommendations to improve outcomes.

Detailed scientific monitoring information for the upper Murrumbidgee River is collected by the ACT Government (Environment, Planning and Sustainable Development Directorate – EPSDD) and is available on request by the Natural Resource Commission (NRC) to support the review.

1. Evaluating the effectiveness of the Water Sharing Plan

Achieving the environmental, social and cultural objectives of the WSP (Part 2) in the upper Murrumbidgee River is most directly influenced by strategies designed to affect the daily flow regime. Of primary importance are strategies for establishing flow classes to reserve a portion of the natural flow regime (Division 2 of Part 8), and provisions for low flow protection (clauses 56 and 57) and compliance with those provisions.

This section provides a summary of issues and information directly relevant to the evaluation of these current strategies and performance indicators. Collectively, the summaries provided below indicate that:

- Minimum low base flow conditions are not being preserved to support longitudinal connectivity:
  - this has led to river reaches becoming disconnected and ceasing to flow
- Native fish populations are heavily impacted by flow regulation as evidenced through:
  - low survival of Murray Cod sub-adults
  - intermittent detection of fish
  - low abundance of key species
  - loss of critical habitat because of sedimentation.
- Water quality (specifically bacteria and harmful blue-green algae) is poor which impacts on the ecological health, and social and cultural uses of the waterway.

The summaries below highlight a need for a thorough review of the settings for the existing flow management and take provisions, and the inclusion of additional provisions within a revised WSP. Recommendations/suggested actions follow in Section 2.

Murrumbidgee River cease-to-flow event, 2019

In October and November 2019, during one of the worst droughts on record and unprecedented bushfires, the Murrumbidgee River ceased to flow at Angle Crossing, near Tharwa. Water was required to be trucked to the township of Tharwa for supplying stock and domestic water, and for fire-fighting reserves (ABC 2019). Large sections of the Murrumbidgee River became impassable for native fish, unsuitable for platypus, and created a heightened risk of fish kills. Yet, inflows into Tantangara Dam varied from 200 ML/day during October and November 2019, to 40 ML/day in December 2019 and January 2020.

Water licenses in the Murrumbidgee I and Murrumbidgee II water sources are managed via allocations and cease-to-pump rules. In the Murrumbidgee II area, the cease-to-pump rule is 27 ML/day at the Billilingra streamflow gauge. Figure 1 indicates that the streamflow during November 2019 dropped well below the cease-to-pump threshold.

There are four issues leading to this cease-to-flow event:

» extreme climatic conditions

» insufficient releases from Tantangara Dam to maintain the minimum river base flow

» non-compliance with water take licence conditions within the Murrumbidgee II area (MDBA 2020).

Climate projections (discussed below) increase the likelihood of these cease-to-flow events becoming more frequent if left unmitigated by the WSP.

Figure 1. Daily streamflow (ML/Day) at Billilingra, Murrumbidgee River between October and November 2019. The cease-to-pump rule is 27 ML/Day. Minimum observed streamflow of 3 ML/Day. Source: WaterNSW.

Tantangara Dam and Snowy Water Licence

Tantangara Dam and Snowy Water Licence Tantangara Dam became operational in 1960 as part of the Snowy Mountains Hydro-electric Scheme. Approximately 96% of flow in the upper Murrumbidgee River is diverted to Lake Eucumbene for hydropower generation. Tantangara Dam is operated under the NSW Snowy Water Licence (2002).

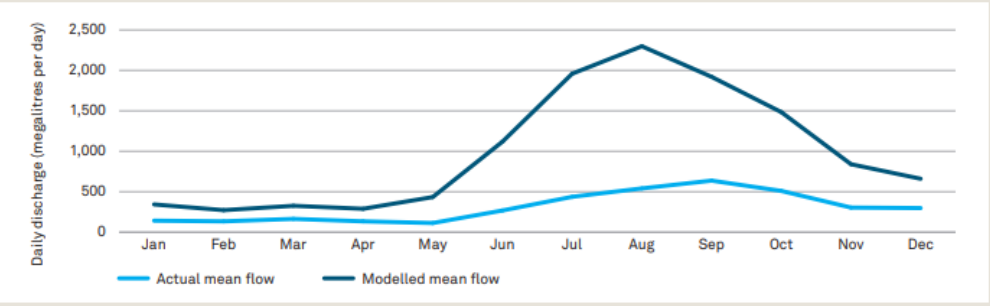


Figure 24:
Modelled and actual flows in the Murrumbidgee River downstream of Tantangara Dam at Mittagang crossing near Cooma.

Date sourced from: Environment, Planning and Sustainable Development Directorate.

Note: Modelled flows are those predicted in the absence of any river regulation or abstraction. The graph shows mean monthly discharge only, upper and lower ranges may vary considerably.

Figure 2.
Modelled vs actual mean daily streamflow by month for Murrumbidgee River downstream of Tantangara Dam. Water diversions have resulted in the Murrumbidgee River being in 'perpetual drought' since the Tantangara Dam came into operation. Source: ACT State of Environment Report 2019, p. 304.

Tantangara Dam operation has caused a dramatic reduction in daily streamflow that is particularly evident in late-winter and spring (Figure 2). Critical hydrological functions, such as scouring of sediments and prevention of the encroachment of riparian flora within the river channel, are impeded by the high level of water diversion (Snowy Scientific Committee 2010; OCSE 2019).

The Snowy Water Licence requires releases to be made to maintain a minimum base flow target of 32 ML/day measured at the Mittagang Crossing streamflow gauge. The baseflow target may be met by the combination of releases from dam, planned environmental releases (Snowy Montane River Increased Flow) or natural catchment run-off.

The Snowy Montane River Increased Flow provides up to 27 GL per year to be released from Tantangara Dam into the Murrumbidgee River. The Increased Flow was designed to supplement the natural unregulated catchment run-off to enable achievement of the river's environmental objectives. However, the Snowy Scientific Committee concluded in its 2020 report that the Increased Flow provision was not adequate to support the environmental objectives of the Murrumbidgee River. The Snowy Montane Increased Flow was not designed to mitigate the climatic extremes that the region has been recently experiencing.

The impact of the flow diversion and inadequate river flow has become more pronounced in the Murrumbidgee River. This is demonstrated by declining water quality, poor native fish outcomes and inability to meet minimum flow conditions for town water supply.

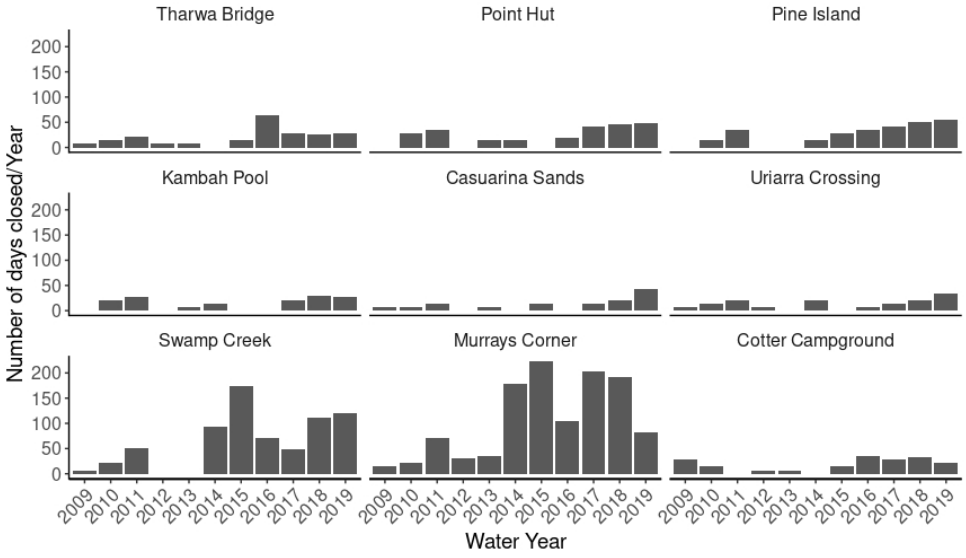


Figure 3.
Plots illustrating the number of days per year that the Murrumbidgee River is closed to primary contact due to exceedance of faecal enterococci loadings. Tharwa Bridge, Point Hut and Pine Island are sites in the upstream reach of the Murrumbidgee River (ACT) and are directly influenced by inflows from NSW. These upstream sites suffer the greatest incidences of closures compared with the downstream Murrumbidgee River sites - Kambah Pool, Casuarina Sands and Uriarra Crossing (Vincent et al. in review)

Water quality impacts on social and cultural uses

The upper Murrumbidgee River supports a wide range of values: water supply (domestic, urban and agricultural), critical ecosystem functions (e.g. fish population connectivity, biodiversity, threatened species), and social and cultural (indigenous culture, swimming and recreation). Water quality is fundamental to maintaining these values, and this is dependent on maintaining adequate river flow and healthy catchments.

High loads of faecal enterococci are commonly detected in the upper Murrumbidgee River at levels that exceed human health guidelines and result in frequent health declarations closing the river to primary contact (i.e. swimming) in the ACT (Figure 3). Many of these instances are associated with rainfall events that transport material from agricultural land within NSW. The catchment run-off leads to high turbidity and bacterial contamination within the Murrumbidgee River (example in Figure 4) (Vincent et al. in review). These rainfall events are often followed by low-flow conditions which support bacteria blooms. Indeed, high levels of pathogen contamination have been recorded near abstraction points for ACT water supply. Increased faecal enterococci loadings can have significant human health consequences.

Native fish of the upper Murrumbidgee River

The upper Murrumbidgee River is reported (Malam et al. 2021, Lucas et al. 2019, and Lintermans 2002) as containing a degraded native fish community, with only six of the nine native fish that were historically known to occur within the reach now being found in the river. Silver Perch are functionally extinct. Trout Cod have not been recorded in ACT Government monitoring since

2016. Two-spined Blackfish are now isolated to the Cotter River and potentially a small population near Tantangara. Macquarie Perch are now restricted to a diffuse population upstream of the ACT and within the Cotter catchment.

Murray Cod and Golden Perch are the key recreational native species within the region. The Murray Cod adult population is considered close to capacity for the available aquatic habitat. Recruitment of Murray Cod is evident, but the survival rate of sub-adults is low. Golden Perch do not appear to be breeding or recruiting in the ACT and have fallen in numbers over the past 10 years.

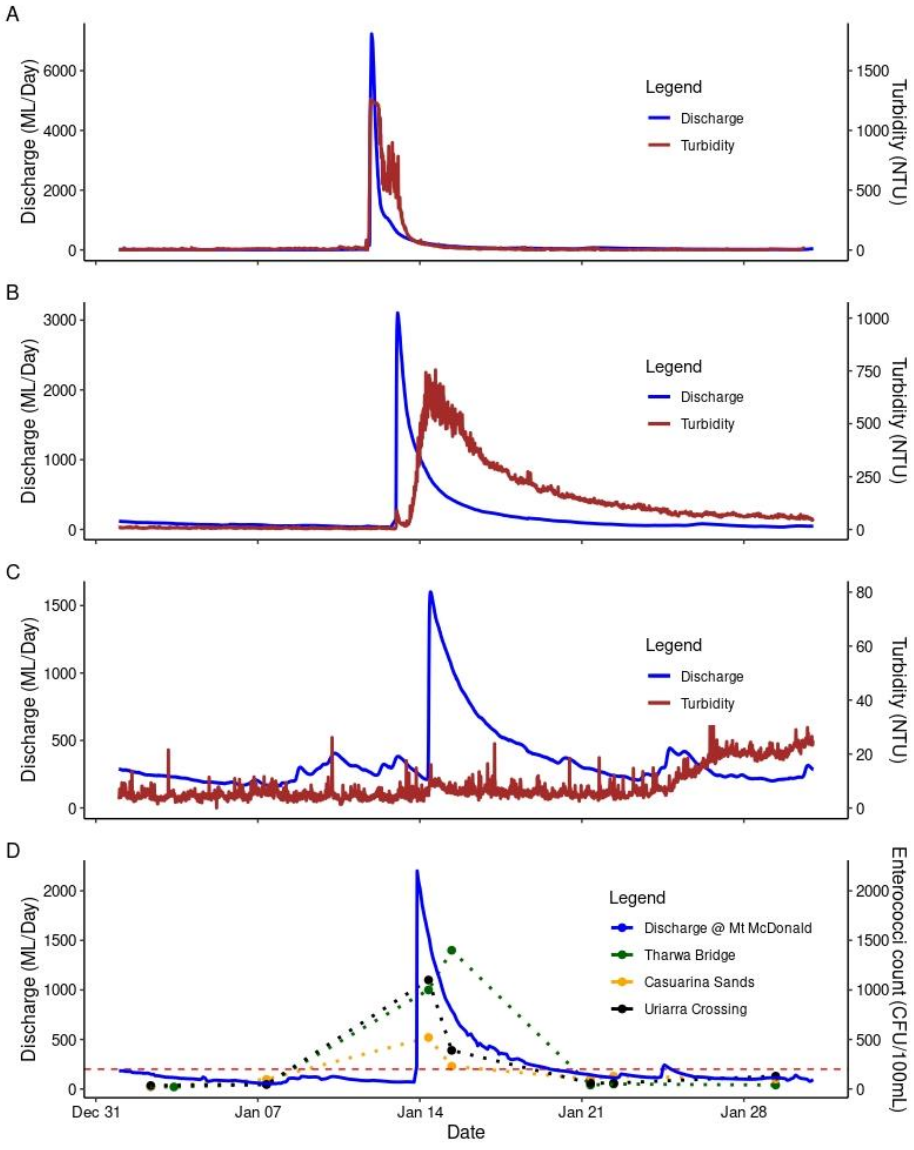


Figure 4.
Plots of stream discharge (ML/Day) and Turbidity (NTU) associated with a 2019 storm event at: A) Numeralla Rivera at Chakola, B) Murrumbidgee River at Angle Crossing (where flows enter the ACT) and C) Murrumbidgee River at Halls Crossing (where flows leave the ACT). D) shows enterococci counts (CFU/100mL) at Tharwa Bridge, Casuarina Sands and Uriarra Crossing; and stream discharge (ML/Day) at Murrumbidgee River at Mt McDonald (mid-point of the ACT). The red dashed line (200 CFU/100mL) indicates the threshold for enterococci counts above which swimming sites are closed to primary contact recreation.

Native fish depend on connected, flowing waterways. Native fish population condition is directly linked to the occurrence of flow pulse events that enable fish dispersal and spawning. The timing and volume of these events are critical. The severely impaired flow conditions resulting from Tantangara Dam operation, the defined flow classes and daily access rules for water extraction, sedimentation of critical habitat, and decline in instream water quality are not supporting the objectives of the WSP. Instream aquatic species populations are often disconnected and unable to pass barriers, both natural and anthropogenic, because of insufficient river flow.

Fish populations have been monitored biennially across six long-term monitoring sites by the ACT Government through the Murrumbidgee Fish Monitoring Program since 1996. The monitoring program includes sites at Angle Crossing and upstream of the ACT in the Upper Murrumbidgee Demonstration Reach (https://storymaps.arcgis.com/stories/0bd080f5140f4883a9914dc7aafacdea).

2. Recommendations/suggested actions to improve outcomes

Key strategies contained within the WSP, relevant to the issues summarised above are:

- Maintain strict compliance with a long-term average annual extraction limit and sustainable diversion limit (Part 6)
- Reserve a portion of flow to partially mitigate alterations to the natural flow regime through establishing flow classes (Division 2 of Part 8)
- Reserve a portion of flow to maintain longitudinal connectivity within and between water sources by protecting low flows from extraction (clauses 56 and 57).

The issues raised indicate that the provisions enacted by the current WSP are not fully effective for supporting the environmental, cultural and social objectives of the WSP.

Amendments to the WSP

The significance of the issues identified provides a strong case to enact the authorised amendments contained within Part 12 of the WSP. The Coordination Group supports the following authorised amendments to be enacted as a matter of priority, to provide active management of the water resources within the upper Murrumbidgee River:

- Establish a variable cease to pump access rule in Murrumbidgee I and II Water Source that reflects seasonal variations, protects the Snowy Montane Rivers Increased Flow releases, and protects other releases from Tantangara Dam to maintain minimum base flow (established under Part 8), and
- Establish and assign total daily extraction limits (TDELs) and/or individual daily extraction limits (IDELs) (established under Part 8).

Operations and procedures

Active management of the water sharing arrangements within the region is fundamental to the security of water supply (quantity and quality) in the ACT and surrounding regions. It underpins the effectiveness of water access dealing rules and water take licence conditions, and provides confidence in the operation of the WSP. Water compliance and enforcement is a critical function for active management.

To support the establishment of active management within the region requires monitoring and reporting improvements, specifically:

- improvements in the measurement and public reporting of water take (Part 11);
- active compliance and enforcement of water access dealing rules and water take licence conditions;
- implementation of the WSP Monitoring Evaluation and Reporting Plan to underpin future evaluation against the key performance indictors; and
- routine monitoring and public access to water quality and hydrometric data.

Monitoring and reporting within the region could be improved through enhanced collaboration arrangements with the ACT Government and the Coordination Group.

Snowy Water Licence and Tantangara Dam operation

Releases of water from Tantangara Dam are insufficient to support the objectives of this WSP – this includes critical human water needs, supporting regional economic development, critical ecological function and cultural values and uses.

A review of the Snowy Water Licence is currently underway and is investigating options for actions relating to environmental water and increased flows. The extent that these investigations are considering changes in the Snowy Montane Increased Flows into the Murrumbidgee River is not clear in the published updates (dated June 2021). The Coordination Group has not been consulted by the NSW Department on the Snowy Licence Review.

The Natural Resource Commission is requested to consider the effect of the Snowy Water Licence as an external influence on the environmental, social and cultural objectives for the WSP, to highlight and advance the consideration of unmitigated risks and opportunities for investigation through the Snowy Licence Review.

Risks to the objectives of the WSP, associated with the operation of the Snowy Water Licence, could be made explicit in the Water Resource Plan for the Murrumbidgee River, a Commonwealth policy document under the Water Act 2007 (Cth). The Commonwealth Government is the sole shareholder of Snowy Hydro.

Options for improving the operation of the Snowy Water Licence for outcomes in the Murrumbidgee River could include:

» Minimum storage release as measured directly downstream of Tantangara Dam and an increased minimum daily flow target at Mittagang Crossing

» Increase the volume of the Snowy Montane Increased Flow for environmental outcomes; and

» Introduce a cultural flow provision to supplement the environmental and baseflow releases.

Further information and discussions

Mr Ryan Breen, Director Water Policy in EPSDD, ACT can be contacted on 02 6207 8628 to provide additional information as offered in this submission.

Additionally, if it would assist the NRC, members of the Coordination Group would welcome a discussion on the issues and solution set. To arrange this, please contact Mr Breen or Dr Maxine Cooper, Chair, ACT and Region Catchment Management Coordination Group (pm.words.work@bigpond.com).

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ABC (2019) https://www.abc.net.au/news/2019-12-14/tharwa-residents-digging-in-mud-to-ease-water-supply/11798840

Malam, C., Brawata, R., McLean, N., Stevenson, B., and Seddon, J. (2021) Conservation Effectiveness Monitoring Program: Aquatic and Riparian Ecosystem Condition Assessment & Monitoring Plan. Technical Report. Environment, Planning and Sustainable Development Directorate, ACT Government, Canberra.

Lucas, Z., Evans, L., Beitzel, M., Jekabsons, M. (2019) Why can't fish cross the road? Barriers to fish passage in the national park and reserves of the ACT. Unpublished report, Research Report Series. Environment, Planning and Sustainable Development Directorate. Act Government, Canberra

Lintermans, M. (2002) Fish in the Upper Murrumbidgee Catchment: A review of current knowledge MDBA (2020) The Basin Plan 2020 Evaluation. Murray Darling Basin Authority, Canberra.

OCSE (2019) ACT State of Environment Report. Office of the Commissioner for Sustainability and Environment, Canberra.

Snowy Scientific Committee (2010). The adequacy of environmental flows to the upper Murrumbidgee River. Report SSC_4. Prepared by the Snowy Scientific Committee for the Water Administration Ministerial Corporation of New South Wales. Canberra.

Vincent K, Starrs D, Wansink V and Lal A (in review) Relationships between extreme flows and microbial contamination in inland recreational swimming areas.

Data Sources:

WaterNSW: https://realtimedata.waternsw.com.au/

Bureau of Meteorology: http://www.bom.gov.au/waterdata/

ACT Open Data Portal: www.data.act.gov.au

Appendix D –
2021-22 Financial Report

Summary	
Income - invoiced contributions	$120,000
Expenditure (against invoiced funding)	$110,309
Available funding (uncommitted invoiced)	**$9,691**

Funding contributions - Invoiced	Projected (annual)	2021-22	Total	Comment
Total			**$120,000**	
Snowy Mountains Regional Council	$13,000	$13,000	$13,000	
Queanbeyan-Palerang Regional Council	$13,000	$13,000	$13,000	
Southeast Local Land Council (NSW Gov)	$13,000	$13,000	$13,000	
Yass Valley Council	$13,000	$13,000	$13,000	
National Capital Authority	$34,000	$34,000	$34,000	
Icon Water Ltd	$34,000	$34,000	$34,000	

Funding contributions - Invoiced	Projected (annual)	2021-22	Total	Comment
1. Upper Murrumbidgee Catchment Network	$107,000	$100,909	$100,909	UMCN 2020-21 expended in 2021-22- **$40,000** UMCN 2021-22- **$60,909**
2. Building community understanding*	$610,500	$610,500	$610,500	ACT Government funding*
3. Leadership Package**	$0	$0	$0	
4. Admin (Annual report)		$9,400	$9,400	2020-21 report

*ACT Government (EPSDD) funded the continuation of the H2OK project.

**Project not progressed. ACT Government has provided funding for catchment groups aligned with the project's intended outcomes.