

Visions for Armidale's creek lands



Example of a local water feature showing beautiful reflections of sky and vegetation

Generations of Armidale's residents have held a desire to enhance the natural beauty of the city by creating expanses of water along its creek lands enabling reflections in water of the sky and colours of our natural and managed landscapes.

The result would be improved aesthetics, recreation, environment and quality of life in our classic city.

Summary

This document seeks to encourage Armidale's residents to help develop and support an exciting vision for the creek lands, and takes some inspiration from a city created on a former sheep station – the city of Canberra – with its beautiful, man-made Lake Burley Griffin completed in 1963 from plans made back in 1918. We have also been inspired by the water features created in other inland cities and towns in Australia and around the world.

Without water, mankind cannot conceive of life. All major cities of the world have water as a focal point. Armidale too could have significant bodies of water reflecting its landscape.

Whilst Armidale, located in a shallow valley on the Northern Tablelands, doesn't have the luxury of a harbour or a major river, it does have Dumaresq Creek and its tributaries. These intermittent streams and waterholes only display large expanses of water during brief episodic flood events. With good planning, the creek lands can be modified throughout the city to enhance the beauty and health of the creek lands environment.

Since the times of the original Aboriginal inhabitants, water has always been central to the success of this place now called Armidale. Throughout its more recent history, Armidale has depended on several dams for its survival. Since 1968, when Malpas Dam was built following much political controversy, Armidale has had a secure water supply. We believe it is now time to develop plans – which have gestated in many residents over past decades – to beautify the creek lands by creating larger ponds, wetlands and small lakes for the benefit of all.

Over at least several decades, and especially during the 1990s and 2000s, ideas have been put forward by many residents for the design and creation of significant water features throughout the city, enhancing recreational opportunities for walking, cycling, sculpture, picnicking etc.

Over the past decade, significant work has been done along the creek lands establish ribbons of native vegetation – largely by energetic volunteers with funding from various government sources under the watchful eye of the NSW Environment Protection Authority. Whilst this has no doubt assisted in slowing water down as it moves down the creek, in many instances, the trees have hidden the creek further from view.

We believe that with the right design, planning and execution, the city can develop beautiful features along the creek lands with significant water views, serving as a focal-point for Armidale as Lake Burley Griffin does for Canberra. In doing so, the City could in time create a series of these, both aesthetically pleasing and environmentally functional. Native vegetation and birdlife would be enhanced by greater access to water, especially in off-stream ponds or lakes. We envisage a rehabilitated, healthy, functioning stream with waterways maintained with the help of re-established pools and riffles. Armidale's autumn colours would complement the water views and, together with native plants, would substantially enhance recreational use.

Being a city with a strong interest in all levels of education, Armidale and its students and staff could benefit from a strong interaction with this Vision for a more beautiful and functional city environment – from developing the concept through to all stages of implementation and maintenance of the creek lands in a healthy state, meeting the flood-risk mitigation constraints specified by environmental regulations.

We realise that visions need to be followed by feasibility studies and careful design and detailed hydrological and environmental studies before plans can be adopted by Council for implementation. In the meantime, in preparation for the gradual implementation of this plan, we call on Council to reserve large areas of public lands along the creek lands for this purpose.

Background

Without water, mankind cannot conceive of life. The cities of the world have water as their focal point, often in river or harbours naturally well-endowed with water: the Tiber of Rome, the Thames of London, the Hudson of New York, the Seine of Paris, the Yarra of Melbourne, the Brisbane River, the Swan of Perth, the Derwent of Hobart, the Torrens of Adelaide, etc.

Being Australia's highest city, located in a shallow valley on the Northern Tablelands, Armidale doesn't have the luxury of a harbour or a major river – it has Dumaresq Creek and its tributaries. These creeks consist mostly of a natural series of intermittent streams, ponds and waterholes only holding significant quantities of water during brief, episodic flood events. In the centre of the creek is mostly contained by man-made, narrow, rock-lined, gutter-like walls.

And yet, water is central to the success of Armidale, as it is for any city. It has depended on a sequence of constructed water reservoirs beginning with Dumaresq Dam in 1898, Puddle dock Dam in 1928 followed by the Gara Weir in 1954. Then, after much political debate, Malpas Dam was built some 40 km north of Armidale, near Guyra in 1968. This secure water supply has helped maintain the quality of life in Armidale for nearly 50 years.

The Armidale creek lands lie at the heart of this classic city in northern NSW – in fact, they are the city's arteries. They have been a source of pleasure for generations of residents and visitors. When Armidale was first settled, Dumaresq Creek – already a gathering place for the local Aboriginal people – was a source of water for "... the railway, the local brewery, tannery, flour mills and swimming baths". (Belshaw, J, Armidale Independent <http://starcommunity.com.au/armidale-independent/2011-12-26/armidales-dams/>). In later years, problems emerged leaving some toxic residues due to early industrial uses of the creek surrounds such as the city's gas works.

Before the construction of the Monckton swimming pools, the creek lands also provided a series of water holes for recreational swimming. Over generations, work has been done to overcome some of the toxic problems caused by early misuse of the creek.

Many have long recognised that the beauty of the city could be greatly enhanced by improving the aesthetic qualities of the creek lands.

Recently, others have invested considerable time, effort and money to improve the native vegetation along the banks of the creek. Armidale however, is still a city with no capacity to see itself reflected in any significant body of water – something that most cities of the world have achieved, either through inheritance of a natural body of water or through the creation of an artificial lake or other water feature.

Like all cities, Armidale strives to improve its quality of life and environment. Central to the city and its future is the need to provide reasons for people to want to live in a regional city such as Armidale. At a time when the city is debating what to do with the city's former water supply, Dumaresq dam (built in 1898), and how to create a new Civic Precinct including a Performing Arts and Conference Centre, and to enliven the central city mall, we believe it is appropriate to remind residents of the need for a living, breathing, heart to this city, ensuring the health and beauty of its arteries, its creek lands.

In this document, we seek to reinvigorate a Vision created some 14 years ago which to date has languished in filing cabinets and in the minds of its creators. Back in April 2002, over 70 residents came together in public meetings to develop these concepts. We continue to develop the concepts proposed by this enthusiastic cohort of residents who continue to live in the hope that one day some of their dreams might be realised.

We are fully aware that any interventions in the creek lands must be carried out only after substantial, careful planning. Most importantly, the risk of flooding must not be increased – indeed it should be mitigated.

Vision for Armidale’s Creek Lands Committee – aims

The following aims for Armidale’s creek lands were developed by a sub-committee of a group of some 70 people who debated and considered many options back in 2002. They are still seen to be relevant today and those people are still waiting to see their Vision realised.

1. Beautiful water features with water views, serving a similar function for Armidale as Lake Burley Griffin does for Canberra. Initially, this could include an attractive pond near the Information Centre, perhaps with a restaurant/cafe overlooking it. Another 3 candidate areas were also identified as early priorities.
2. Enhanced recreational opportunities around and alongside suggested water features reflecting both autumn colour and native vegetation
3. Enhanced water quality ensured using pools and riffles without creating erosion or sedimentation and
4. A greater variety and abundance of wildlife with off-stream water bodies.
5. Flood mitigation features addressed.

Making the case for changes to the creek lands – in pictures

The image below shows the state of the creek lands 14 years ago – around the time of the community meeting held to help develop a vision for the creek lands. In many parts of the creek lands, there has been little change since that time.



Dumaresq creek can become partially blocked at times (photo taken in 2002). This is still the case in 2017!

What might extensive water features in Armidale look like?



A typical view of the Dumaresq Creek looking west from Stephens Bridge on Marsh St (2002)



A modified image of Dumaresq Creek looking west from Stephens Bridge on Marsh St showing a possible expanse of water



Looking south-west from the corner of Markham and Dumaresq Streets (2002)



Image modified to show a large pond south-west of the corner of Markham and Dumaresq Streets



Looking south from Donnelly St (2002)



Image modified to show expanse of water south of Donnelly St

Examples of engineering works with water in two overseas cities

Visitors to any number of overseas cities have no doubt seen how different communities have constructed water features to beautify their environment.



Path and water weir in Ottawa, Canada



Water is a feature in San Antonio, Texas, USA

Views of water are the key focus of all Australian capital cities

Whilst we recognise that Armidale is a regional city – not a capital city built around a major water resource – we suggest it is worthwhile to contemplate just how important water is to all the cities of the world. In Australia, the capital cities of Sydney, Melbourne, Adelaide, Hobart, Perth and Darwin all have access to major harbours.

Some cities located on major rivers – such as Brisbane – have added aesthetically pleasing water features such as those shown below which have been constructed in the Roma Street precinct of Brisbane.



Brisbane



Brisbane



Brisbane city – Roma Street



Brisbane city – Roma Street

In all cities where water is an important focal point, great efforts have been expended in making the water features accessible for all those wishing to enjoy the views and recreational opportunities offered at the intersection between land and water.

Some examples of what inland towns and cities in Australia have done with water

Whilst thinking about what the major cities of the world and of Australia have done to make the most of their water assets can be instructive, it is most relevant to consider what some inland towns and cities of Australia have done with water, given their unique topographical features.

An example of a successful creek development is that of 5 Creeks in Fairfield, a suburb of Sydney. “Now we realise that the creeks are more than drains: they are important to preserving the environment and enrich community life”.

http://www.fairfieldcity.nsw.gov.au/download/downloads/id/352/five_creeks.pdf

Some examples of successful water features are shown below.



Toowoomba



Toowoomba – University of Southern Queensland



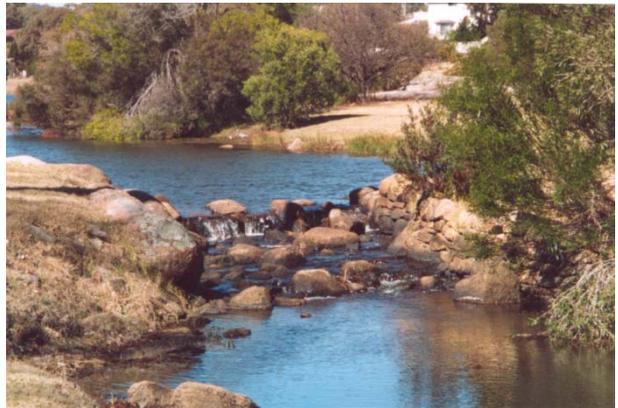
Cowra, NSW – Japanese garden



Coffs Harbour, NSW



Stanthorpe, QLD in spring



Stanthorpe, QLD



Stanthorpe, QLD showing levee



Cafe overlooking Benalla Art Gallery



Benalla Art Gallery on artificial Lake Benalla created on the Broken River in 1973 as an ornamental feature



Cottons weir on Lachlan River at Forbes

Goulburn, in southern NSW, has also created a 'chain of ponds' along parts of the Mulwarree River.



Creating a berm wall in the Mulwarree River wetlands region of Goulburn (2011)

Australia's most famous artificial lake – an example of enhancing water in an Australian inland city environment

Whilst Armidale cannot contemplate creating such a grand gesture as the lake in our national capital, we suggest it is useful to consider some of the features and history of the creation of this artificial lake.

Lake Burley Griffin, designed by Walter Burley Griffin in 1918 but not completed until 1963, was central to the planning of the national capital, Canberra. Details of the history of this man-made lake can be found at the following link:

https://en.wikipedia.org/wiki/Lake_Burley_Griffin#Walter_Burley_Griffin.27s_design

The water is retained by Scrivener dam which is further described here:

https://en.wikipedia.org/wiki/Scrivener_Dam

Images of the lake are shown below. Its surrounds, consisting mainly of parklands, are popular with recreational users, particularly in the warmer months. Though swimming in the lake is uncommon, it is used for a wide variety of other activities, such as rowing, fishing, and sailing.

“The lake is an ornamental body with a length of 11 kilometres; at its widest, it measures 1.2 kilometres. It has an average depth of 4 metres (13 ft) and a maximum depth of about 18 metres (59 ft) near the Scrivener Dam. Its flow is regulated by the 33-metre-tall (108 ft) Scrivener Dam, designed to handle floods that occur once in 5,000 years. In times of drought, water levels can be maintained through the release of water from Googong Dam, located on an upstream tributary of the Molonglo River”

https://en.wikipedia.org/wiki/Lake_Burley_Griffin#Walter_Burley_Griffin.27s_design.



Scrivener Dam holds back Lake Burley Griffin with hydraulically operated fish-belly flap gates which prevent flooding of the Lake. Over almost 60 years, this artificial lake has not yet overflowed the dam wall, a tribute to its design specifications.

Armidale can surely learn from this example created last century: firstly, the concept of an artificial lake in a relatively dry region of Australia's inland was feasible; secondly, the lake was seen as central to the planning of the city of Canberra; thirdly, with good design and engineering, this major water feature has not exacerbated flooding and can be managed during dry times; and fourthly, decades later, the beautiful water feature and its environs live on as testament to the careful design and planning commenced almost 100 years ago.

This successful marrying of natural systems with recreational objectives is a fundamental requirement of the water features we envisage for Armidale.

Recent improvements to the Dumaresq creek lands

Over recent years, a lot of work has been carried out to improve the environment along Dumaresq Creek. However, as can be seen from the photographs below, much of the effort has been focused on enhancing biodiversity which has not resulted in many enhanced views of water within the city. Many of the plantings have been carried out by volunteers such as the Armidale Urban Rivercare Group (AURG) and funded by agencies such as the Commonwealth Biodiversity Fund, Armidale Dumaresq Council Waste Services, NSW Health, the University of New England and Southern New England Landcare in conjunction with the High Country Urban Biodiversity (HiCUB) project.



Planting just west of the Rologas sporting fields (August 2016)



New plantings along Dumaresq Creek in Aveliss Ellery Park in east Armidale (August 2016)



Native trees and shrubs planted east of Taylor Street in October, 2012 by Armidale Urban Rivercare Group and Armidale Mental Health Network group (August 2016)



Native planting near Markham and Dumaresq streets by Armidale Urban Rivercare Group (August 2016)



Mike O'Keeffe Memorial Woodland in Black Gully (August 2016)



Water feature with walking path – Black Gully (August 2016)

Before and after images of one area of improved creek lands

Before (2002)



Black Gully to the south of NERAM (2002)



Overgrown Black Gully Creek showing NERAM in the background

After (August 2016)



Constructed pond in Black Gully behind New England Regional Art Museum (NERAM) (August 2016)



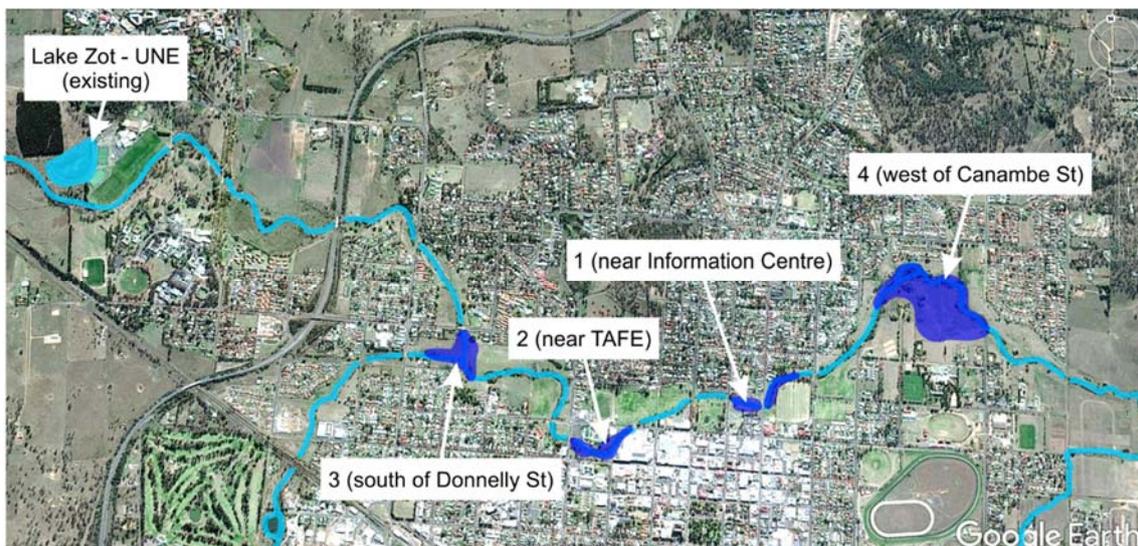
Tree planting along edges of Black Gully (August 2016)

The above recent and excellent improvements to Black Gully Creek have been achieved with contributions from the Friends of NERAM and input from Armidale Dumaresq Council, HiCUB (High Country Urban Biodiversity) project staff as well as Green Corp staff and others.

Four candidate areas proposed for initial water features

The Armidale Creek Lands Vision committee conducted several exploratory trips along the creek lands and arrived at 4 candidate areas as those of highest priority:

1. a series of weirs and/or a large pond near the Information Centre (between Faulkner and Marsh Streets) and another pond extending just east of Marsh St;
2. a series of ponds to encourage wildlife such as water birds (to the north of TAFE in Beardy Street);
3. a catchment lake and wetlands (south of Donnelly Street); and
4. a sizeable 'lake' west of Canambe Street.



Google Earth view of Armidale showing the location of 4 candidate areas mentioned above and the existing off-stream water reservoir shown on the cover of this document (Lake Zot at UNE).

Suggested candidate area 1

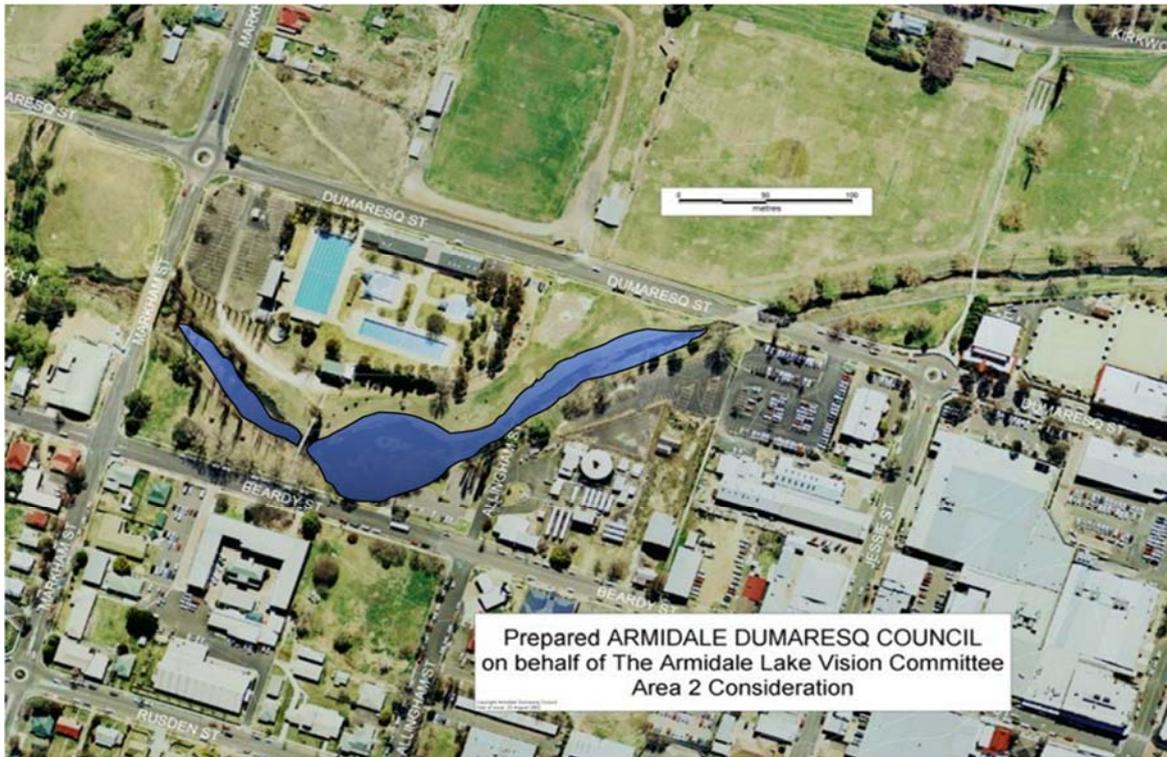


Aerial photograph of candidate area 1 showing the Information Centre and surrounding streets (image taken in 2002)



View of a possible series of weirs just north of the Information Centre – candidate area 1 (drawn by Ken Heenan)

Suggested candidate area 2



Modified image of candidate area 2 showing possible area for duck ponds and wildlife viewing that might be created in this part of the creek.



Sketch showing a plan view of a pond, bridge and bird feeding platform north of the TAFE and south of the swimming pool – candidate area 2 (drawn by Ken Heenan)



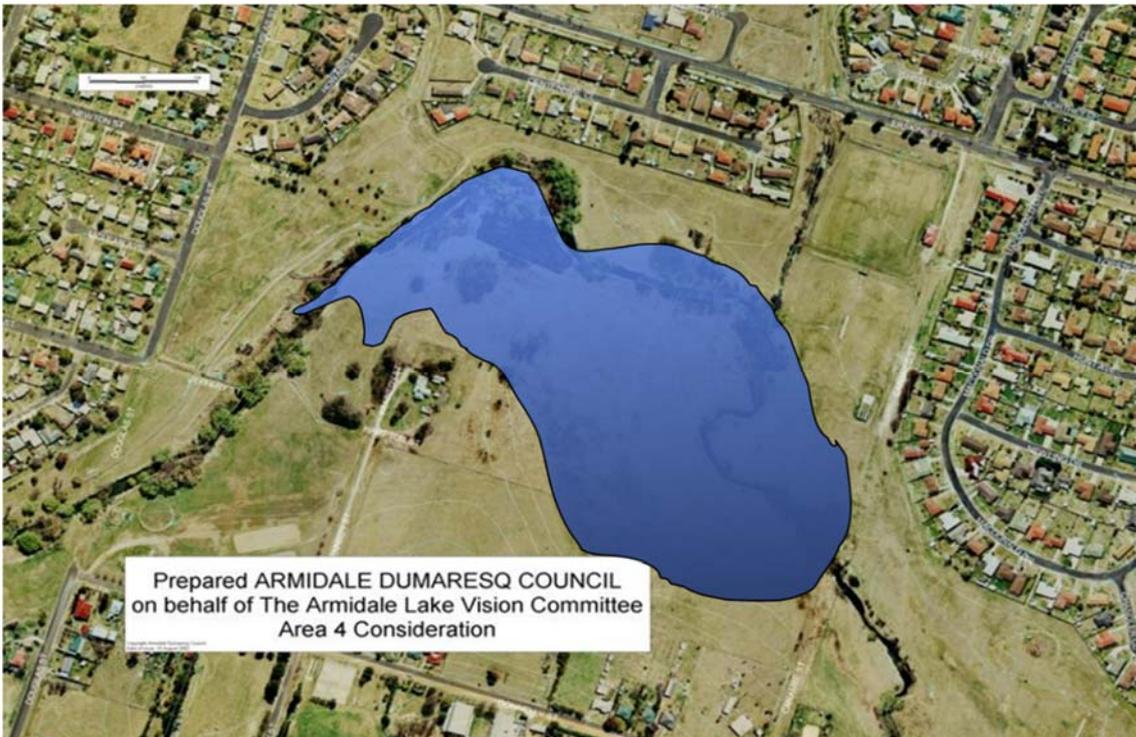
Sketch showing a perspective view of a pond, bridge and bird feeding platform north of the TAFE and south of the swimming pool – candidate area 2 (drawn by Ken Heenan)

Suggested candidate area 3



Modified image of candidate area 3 showing the possible extent of an artificial wetland that could be created south of Donnelly Street and east of Niagara Street

Suggested candidate area 4



Modified image of candidate area 4 showing a large expanse of water in an artificial lake that could be created in this region of the creek lands.

Other candidate areas

Other ponds, lakes and wetlands could well be created that have not been discussed here. The excellent work improving the previously overgrown stream in Black Gully behind NERAM suggests that there may be many other possible sites.

There are no doubt numerous other candidate areas such as those in the precinct of the University of New England.



Area north of the Claude Street flats – University of New England (2002)



A modified image of area north of Claude Street flats showing a possible expanse of water and enhanced autumn colour



View to the west of the road bridge over Elm Drive at UNE showing an expanded view of water during a flooding event in August 2016



View to the east of the road bridge over Elm Drive at UNE showing an expanded view of water during a flooding event in August 2016

This document has not considered in any detail areas outside the boundaries of the current city. Of course, many opportunities exist for larger water features to be created either west and/or east of the city. If large bodies of water could be created, this would greatly enhance the recreational opportunities in the city including for fishing, canoeing, rowing, etc.

One such off-stream artificial water storage reservoir, created many decades ago, is Lake Zot at the University of New England. The lake is 690 m long.



Lake Zot, an artificial water storage reservoir built at the University of New England many decades ago.

The possibilities are endless – this document has not considered in any detail areas outside the boundaries of the current city.

Analysis of some risks and opportunities

Risks (and their mitigation)

The potential to exacerbate flooding is one of the principal reasons that has held back ideas for water features. We are aware from a workshop held on April 16, 1999 by representatives of the Macleay Catchment Management Committee and Dumaresq Creek Catchment Group that considerable knowledge exists about the hydrology and environment of Dumaresq Creek and its tributaries. For example, the creek flow ranges from less than 1 to more than 80 megalitres per day with flooding events flowing at up to 2000 megalitres per day. Whereas wetlands and ponds can be built off the main stream of the creek, most regulatory problems occur if weirs are proposed as in-stream structures.

The cost of development is another important area of consideration. Once a plan is agreed to along with a series of implementation options, work could begin early on the most cost-effective options, thereby building interest and momentum.

We realise that these plans could take decades to achieve – just as Lake Burley Griffin did in Canberra – but all beautiful cities develop over long time frames.

Taking the risk-averse nature of our decision makers into account, we see the professional advice of landscape designers, engineers, hydrologists, etc. as vital steps to ensure that any in-stream interventions will function well and not exacerbate flood events. Of course, many interventions need not be 'in-stream'. In any event, we would hope that improvements would rather contribute to flood mitigation and healthier water ways.

We acknowledge that experts in hydraulic engineering, water resources and infrastructure planning need to become intimately involved. Many of these talents exist in the Council, State government agencies and in the University of New England. Of course, any plans need to be consistent with the Armidale Dumaresq Development Control Plan 2012 and its Floodplain Protection and Stormwater Drainage planning instruments.

We believe that if a constructive planning team can be assembled, then any obstacles can be overcome, just as they have in other rural cities and towns in Australia.

Opportunities

The concepts put forward here with the support of a diverse array of residents over a long period are a strong indication of local support. All cities take pride in their natural or man-made features, often including water features. The fact that so many inland towns and cities in Australia have developed water solutions for their own unique circumstances should embolden the decision makers who thus far have been hesitant to substantially modify Armidale's creek lands.

Some of the many opportunities from an enhanced creek lands environment include:

- enhanced recreational use of the creek lands which will add to the vibrancy of the city's life – an increase in walking and cycling paths will increase enjoyment of the area and the health of the residents and visitors
- in addition to the 4 candidate sites highlighted above, it may be possible in future years to see many more water features, ponds, etc. developed over time
- creating deeper water features through excavation will achieve the dual objectives of removing tall reeds which obstruct water views whilst not exacerbating flooding potential

- removing the stone 'gutter effect' channel in the central creek lands will both give a more natural look but also give parents a better view of any straying children
- if necessary, use modern fish belly weirs (see p10 for description of flood gates in Lake Burley Griffin) could be an option to enable flood waters to be released automatically during temporary flood times
- coordinate plans with those being made for the upgrading of Dumaresq Dam (built in 1898) which holds some 440 megalitres of water
- possibility of creating several sizeable off-stream water storages upstream of the city, and downstream from Dumaresq Dam, to help provide water in dry times
- creative use of solar-powered or water-powered pumps to elevate water to allow recycling of some water from downstream to upstream using aqueducts (the Romans built such infrastructure 1700 years ago!)
- some elevated structures across the creek lands, such as dam walls, could perhaps be incorporated into additional road crossings to improve the traffic flow across the city during flood times (e.g. the new bridge planned for Cookes Rd)
- incorporating water features into plans for the creation of a Performing Arts and Conference Centre – it may even be possible to find an area suitable for an outdoor amphitheatre with water views in the background
- further expansion of the ponds behind NERAM in Black Gully which have recently been so successfully rehabilitated and a site for future expansion of sculpture displays
- other higher parts of the city may also be candidate areas for the construction of some ponds which could be integrated into an overall plan (e.g. like the artificial pond in the Arboretum on south hill)
- areas to the east and west of the current city could also be considered as potential areas to be designated for future, larger water features such as sizeable off-stream lakes or dams which would be suited to some water sports such as fishing, canoeing, rowing, etc.

We suggest that suitable compromises can be found. When planning for enhanced water features along the creek lands, it would be of benefit to all if planning considered the full range of perspectives. Processes such as the Recreation Opportunity Spectrum (ROS) developed by the US Forest Service and used by NSW Parks and Wildlife perhaps offers a way for helping to resolve different perspectives.

Education

In addition, there are opportunities for the involvement of all tiers of the education sector in Armidale from pre-school through primary and secondary schools to TAFE and undergraduate and postgraduate research studies at the University of New England. Projects could include monitoring and measuring, wildlife studies, hydrology studies, engineering, urban and regional planning, natural resources, eco-system management, nutrient flows, toxicity remediation, erosion control, etc.

To date, the University has been involved in restoring some of the Dumaresq Creek vegetation within its campus with the aid of the Armidale Urban Rivercare Group. It also has over many years employed those with expertise in understanding fresh water systems such as the late Prof. John Burton, Foundation Professor of Natural Resources, who carried out research relevant to the potential for flooding along Dumaresq Creek with a 3D functional model created of the catchment. Currently, the University employs other relevant experts in healthy soils, waterways and river ecosystems.

Conclusions and recommendations

We believe that over time, with the right design, planning and execution, the city can develop beautiful features along the creek lands with significant water views, serving as a focal-point for Armidale as Lake Burley Griffin does for Canberra.

Armidale can create a cascading series of beautiful water features that will be aesthetically pleasing and environmentally functional. Native vegetation and birdlife will be enhanced by greater access to water, especially in off-stream ponds or lakes, and parts of the creek lands will function as wildlife corridors. We see a rehabilitated, healthy, functioning stream with waterways maintained with the help of re-established pools and riffles. Armidale's autumn colours will complement the water views and, together with native plants, will substantially enhance recreational use, leading to much enjoyment for all users.

Recommendation 1

We call on Council and/or its administrators to support this Vision statement and reserve large areas of public lands along the creek lands for this purpose and ensure that no buildings are constructed within the flood zone.

Recommendation 2

That members of the Armidale Creek Lands Vision Committee create a website dedicated to promoting the vision, concepts, draft plans and historical context of the proposal, especially so that we can engage the broader community, including younger members of the population, in further developing the concept.

Recommendation 3

We invite Council to lead a process of further developing our ideas into concepts and plans that will excite and inspire the broader population of Armidale with its beauty as well as meet the flood-risk mitigation constraints specified by the environmental regulators. It may be that a design competition might assist in reaching an agreed plan.

Recommendation 4

Once the design concept is accepted, the city and community would need to cooperate to make submissions to raise the funds and encourage in-kind contributions to implement the plans in agreed order of priority.

Recommendation 5

We request that Council make a continuing, long-term commitment to realising this vision.

Acknowledgements

Many have made contributions to this Vision of an enhanced creek lands environment in Armidale. Their inputs over many years are gratefully acknowledged.

Authors

This document has been prepared on behalf of Armidale Creek Lands Vision Committee (established in 2002) by Jim Scott with input from Hani Soliman, Izabel Soliman, Susan Dunn, Don Hardman and Graeme Fordham AM.

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