



LOOKING BACK

TAKING STOCK

MOVING FORWARD



Purpose of this plan

The purpose of this plan is to provide an overview of the nature, quality and importance of two streams, being Rocky and its tributary Uralla creeks...and how the efforts of the Uralla Rivercare Group (URG), with assistance from Uralla Shire Council have lead to significant improvements in these aspects for the benefit of the environment and the Uralla Community. This plan provides a summary of past and present stream improvement projects undertaken by the URG, and outlines new and ongoing works for the continued care and maintenance of URG sites along Uralla Creek.

The first part of this plan provides an overview of the history of past projects and activities of the Uralla Rivercare Group (URG). The middle section of this plan deals with current projects, while the final section outlines activities for the continuing care and maintenance of sites URG has managed along Uralla and Rocky River Creek lands. Ideas for new projects are also presented.

Introduction

Creeks and rivers generally have a great diversity of animals and plants compared to adjoining habitats. The vegetation found in stream areas ranges from aquatic plants to mature trees and understorey vegetation. Stream ecology and water quality is greatly influenced by these riparian zones. Riparian zones perform a number of important functions:

- **habitat** - Riparian zones are important to both aquatic and terrestrial animals. The vegetation also shades and buffers the aquatic environment against high temperatures in summer. Land based animals use the riparian zone to shelter, hunt and breed
- **channel shape and bank stabilisation** - River and creek banks are vulnerable to erosion from fast flowing water. Riparian vegetation protects the river channel from erosion
- **water quality** - Riparian vegetation improves water quality by filtering runoff from the catchment and removing pollutants. Pollutants such as organic and inorganic nutrients, herbicides, pesticides and sediments can all be absorbed or trapped by the vegetation before it enters the water body; and
- **recreational and aesthetic values** - Healthy creeks and rivers are peaceful and beautiful. They are important to keep for both us and future generations so we can enjoy them and learn from them.

Good river management is the sustainable use of streams and riparian lands that:

- recognises the linkages between the economic, social and environmental aspects of rivers;
- balances the interests of all users;
- optimises the use of resources;
- is sympathetic of environmental needs; and
- repairs areas degraded by past management.

The URG has long recognised the value and importance of the functions that Uralla Creek provides the community of Uralla. This group has worked tirelessly alongside a number of interested stakeholders, for more than 15 years, to restoratively manage stream health and the natural qualities of once a highly degraded stream. This plan acknowledges their achievements and some future plans.



The Past - 'Looking Back'

Pre-European Settlement Character

In the pre-European state, tableland drainage systems in south-eastern Australia are thought to have been characterised by:

- discontinuous channels with occasional pools and undefined streambanks;
- channels interconnected with floodplain areas that were regularly inundated;
- waterlogged valley floors with swamp surfaces well vegetated by sedges, reeds, tussocky grasses and shrubs. Such areas of high water retention provided a base flow to be retained;
- water quality of healthy condition due to minimal stream bed and bank erosion as well as the filtering effect of well vegetated riparian surfaces; and
- valley margins that were well grassed with occasional large woody debris from woodland associations including Callistemon, Acacia and Eucalypt species.

1990's Condition

In the 1990's the condition of Uralla Creek was of a drainage system that had been extensively degraded, with large infestations of exotic vegetation, wetlands carved out through erosion, associated sedimentation and poor water quality. More specifically, the main riparian management issues of Uralla Creek requiring ameliorative action were:

- growing infestations of environmental weeds such as privet, bamboo, honeysuckle and blackberry, as well as occurrences of in stream willows and hawthorn that obstructed stream flow;
- there was a general deficiency of species diversity, coverage and structural integrity of the vegetation along the creek. Which applied to the whole reach through town and is reflected in other issues that have been identified such as poor habitat provision;
- channel deepening through stripping of alluvial sediments;
- channel widening and creek bank erosion that has been initiated and exacerbated by occasional flooding, channel deepening, loss of vegetation and flow obstructions;
- sedimentation in downstream areas where substantial deposits of sediments had been dumped by floodwaters to reduce the channel capacity of the creek; sediment inputs being from upslope and instream erosion occurring in isolated pockets of the channel in association with creek crossings and vegetative debris.

Rivercare Group: Formation + Goals

• **Managing Stormwater**

In 1998-99 Uralla Shire Council (USC) engaged a consultant to develop a strategy for stormwater management in Uralla Shire. The forthcoming strategy presented professional results of water testing, movement, measurement and requirements of the Local Government Shires Association for stormwater management policies, as well as findings from a survey of landowners who resided on Uralla Creek and other community members. In addition to developing the strategy, the consultant was instrumental in forming a committee that could apply for funding that was available to community groups with environmental concerns but not to Councils.

• **Uralla Rivercare Group Formed** as a result and with the assistance of Southern New England Landcare, Uralla Rivercare Group came into being in 1998. Since its inception, the Group has consisted of people who reside on the creek or have an interest in environmental issues concerning creek land areas.

Guided by the former Department of Land and Water Conservation, the Group developed a river management plan for the reach of Uralla Creek through town. The Uralla Rivercare Plan (2000) aimed to address a number of degradation issues and to strategically remediate Uralla Creek into an aesthetically pleasing and environmentally friendly community asset. Throughout the planning process issues at specific sites were identified and recorded on an aerial photographic plan and their severity ranked to help prioritise the works. The management criteria and recommended actions for each site were provided in detail for the URG to implement.

The initial goals of the URG established in the Uralla Rivercare Plan were to:

- return platypus to the creek system;
- establish native riparian vegetation communities; and
- create a stream that provides recreational and aesthetic appeal.

In working towards these primary goals, an outcome that was important to the URG was to develop a walk along the creek lands, to link the southern side of Uralla with the main town and shopping precinct.

In the first instance, URG aimed to work on the streams or sections of stream, that were in the best condition before trying to improve those in poor condition. URG volunteer time and funding would be better spent with this approach rather than trying to fix reaches that were extremely degraded.

• **Remediation Works Undertaken**

URG decided to make the presence of its newly formed group publicly known and that it was a new group with a new focus, aiming to make a difference to Uralla Creek. As such the group commenced a number of remediation strategies that were identified in the Uralla Rivercare Plan, to address the degradation of the creek including:

- removal of targeted willows and exotic weeds;
- establishment of native riparian vegetation;
- improvement of stormwater outlets with trash racks etc.;
- stabilising eroding areas with physical bank protection and bed erosion control structures;
- restoration of pool/riffle sequences in the creek channel;
- strategic replacement of in-stream debris; and
- fencing to exclude livestock, where necessary, to facilitate revegetation.



URG set about implementing these in a strategic manner over the following 15 years or so. These efforts are summarised below.

In 1999, URG held its first working bee on Council owned land on the corner of Park and Maitland Streets. This Park Street Reserve site is never to be a road and is the junction for a main stormwater drain. The drain was causing erosion with its run-off going directly into Uralla Creek and, in times of heavy rain, into the backyard of private land. The Creek was blocked by many medium to large in-stream willows, overgrown mounds of blackberry, privet, honeysuckle, hawthorn and other weeds, as well as gross pollutants. The area was easy to access, so URG started to clear it out. Many dead willows were pulled out by hand and others were cut and poisoned. Weeds were sprayed in autumn with follow-up sprays in spring for two years. Three working bees later and the spot was looking vastly improved.

Power lines run through this site, so URG asked Essential Energy (then NorthPower and later Country Energy and now Essential Energy) if they would donate \$500 worth of plants. They agreed, so URG was away with a first planting, of 500 native plants.

In 1999, URG also decided to develop a river plan, together with Uralla Shire Council and the Department of Land and Water Conservation (DLWC). A walk was organised with group members, Tim Elder (DLWC) and Arnold Goode (Uralla historian). The walk started at the Fossicking Area on Rocky Creek, followed an erosion gully (mainly created from the goldfield days) and joined up with Uralla Creek. The walk continued along Uralla Creek, through the main town area and up to the headwaters to another deep, wide and extensively eroded gully. Following our walking inspection, URG's first River Plan was published in 2000.

In 2001, with \$4000 from Citizens Wildlife Corridors Armidale Inc., URG's work on the Park Street-Maitland Street corner received a boost and the development of the Park Street Wildlife Corridor began, and continues today. URG has held many working bees at this site and funding and support for works at this site have been provided by Country Energy, Fields Native Nursery, students from Uralla Central School, URG volunteers and other community members. In 2007, this site also became part of a Green Corps team project. The area was fenced and posts were turned into artworks or totem poles representing wildlife and creek flora. This section will eventually become part of URG's vision to have a Creek Walk which will start from the Walcha Road bridge.

Around 2002, URG carried out a planting at Duke Street. This area was just barren grassland with extremely hard soil. The group applied a heavy layer of mulch in three large shapes and left it for two months. Then, 500 shrubs were donated by Country Energy (now Essential Energy) and URG planted out this site. In 2006, 500 *Lomandra* were planted adjacent to private land next to this site. Unfortunately the 2006 planting had a poor survival rate. However, there is evidence of healthy *Lomandra* growth in patches.

In 2001-2, URG received \$24,900 for our 'Natural Heritage Trust – Envirofund Uralla Creek Dance Clear Water Revival Stage I' project. By completion, with other funds and in-kind support, this project's total value amounted to \$75,073. This project installed a low profile rock ramp or riffle that was designed to control creek bed erosion that was about 4m in height. The rock ramp, which was constructed with large rock boulders and underlain with geotextile, was blended into the natural surrounds of the site and has coped well with the hydraulic pressures of several floods since. Several willows that were obstructing the creek flow were also removed from the creek banks at the same time. In addition, 4000 native trees and shrubs were subsequently planted and a follow-up planting of 200 seedlings replaced losses the following spring.

In 2003-4, URG received \$15,368 for our 'Natural Heritage Trust – Envirofund Stage II, East Street' project. Using this money, other funding and in-kind support (to a total project value of \$56,234) from Country Energy and Uralla Shire Council, over 30 medium to very large willows were removed or lopped and poisoned, and 1200 native trees and shrubs planted. Most of the planting was on private land and unfortunately the survival rate was poor. This Stage II Project was completed in May 2006, after three subsequent working bees were held at this site. Additional work removed willow debris that was in the waterway to prevent re shooting, planted another 1300 native trees and shrubs and reshaped the stormwater drain to slow the water run-off into the lower sections of the area.

URG working bees at this site continued to clear weeds, mow grass and stake plants. This area will need to be revisited, as some of the willows have regrown and the stormwater drain altered.

In April 2007, URG was successful in applying for a Green Corps team (worth over \$150,000) to work on another section of Uralla Creek. The Green Corps team started in June 2007 and completed their works in December 2007. The team consisted of twenty youth with a team leader, as well as a project manager from URG to coordinate the project, with assistance from Greening Australia. The team removed woody vegetation and rubbish from private land adjoining the creek and planted about 2000 native trees and shrubs.

URG also participated in the 'Work for the Dole' program and received a small tools grant, to purchase a variety of tools to assist volunteer work along the creek. This saw the restoration of two sheds and a toilet - providing for storage of URG equipment, a Green Corps team trailer, as well as a place for the Green Corps team to meet and construct items off the creek. With the help of a \$300 grant from New England Credit Union, a 200-litre water tank was added to the shed. Despite these efforts the land was sold in 2015, meaning the tools and equipment had to be stored elsewhere. They are now stored at Uralla Men's Shed, Uralla Road, Uralla, in 2017.

In 2008-09, URG continued the 'Work for the Dole' program for three six-month contracts that facilitated the maintenance of all sites which had been worked on up until that time. Also, in 2008-09 a project funded by the Border Rivers-Gwydir Catchment Management Authority (BRGCMA) supported work on the creek outside of where the Green Corps team were maintaining. This saw the removal of three massive willows, two fallen conifers, several fallen dead trees and debris. Once cleared, this area was planted with 1200 native seedlings.

In 2010-11, the 'Uralla Creek Stabilisation Works Stage II' project, supported by funding of \$22,250 and contributions from the BRGCMA, the Community Targeted Incentives Scheme, the High Country Urban Biodiversity project, the Uralla Shire Council and URG, was completed along the creek on private properties in Salisbury Street, north of the New England Highway. This involved removal of four willows, two large fallen conifers and clumps of bamboo, construction of rock rifles and revetments. Between this time and 2014, bamboo removal and several plantings of native rushes have occurred, using funding from the national Caring For Our Country Program.

In 2011-12, the High Country Urban Biodiversity project and Council supported the creation of artwork at this site - to purchase totem poles, bollards and numbers for the bollards, as well as the painting of pylons under the Council building, stencilling onto pylons and artwork for the totems. This project also covered the cost of artwork for a sign and map at Porter Park, and the production of a brochure. This artwork thus saw the linking up of creek land areas and walk ways with the main street business area and an official opening of the Uralla Creeklands Walk by MP Richard Torbay, took place.

Since 2012/13, Uralla Shire Council has employed two part-time bushland regenerators, to both meet its obligations to maintain work funded by the HiCUB project and contribute to environmental objectives on Council land across Uralla Shire including along Uralla's creeks. Co-ordination between URG and USC is important to enable efficient maintenance of sites and good planning.

Also the 'Be Natural Grant' of **2012/13** and the 'Uralla Creek's Riparian Health - Strength from Biodiversity' project helped stabilise the eastern bank of Uralla Creek by revegetating it with native trees and shrubs. When plantings at this site have grown they will provide a link between Uralla Creek and Mount Mutton Reserve, via Rocky Creek and Alma Park.

In 2013-14, 'The Native Habitat for our Water Rat! Uralla Creek, Uralla' project received funding of \$13,134 from the National Caring for Our Country Program to enhance the natural habitat of the Water Rat *Hydromys chrysogaster*, in Uralla Creek at the rear of 39, 41 and 43 Salisbury Streets. This involved targeted removal of Running bamboo and appropriate revegetation with native wetland and groundcover plants. A variety of other native plants are to be planted at different sites along this section to accommodate landholder preferences.

2014 saw ongoing removal of bamboo at the Caring for Our Country project site and coordination of a 'Work for the Dole' team for five to six months. The Bamboo control seems to have worked but was a learning experience regarding how removal of one weed can encourage the growth of another.

In 2015-16, funding from the Northern Tablelands Local Land Services has provided for the production of this Uralla Creek Plan 2017, by URG.

URG has continued to monitor the condition of Uralla Creek and has carried out maintenance on several sites, including:

- control of grasses through regular fortnightly mowing in spring and summer, then less frequently during cooler months;
- weed control, utilising a combination of hand weeding and spraying, with chemical only being used where necessary (e.g. for bamboo and blackberry); and
- monitoring of plantings, with autumn being a good time to prune back natives, check on larger trees and stake and tie up any that are not straight, assess whether any re-planting is needed at any of the sites and check vine-type weeds are not becoming invasive.

Contributing Community Groups and Funding sources:

Community organisations, groups, schools and local citizens have assisted URG with the Uralla Creek improvement works. URG has been fortunate, and well supported by Southern New England Landcare. In sourcing financial support from a number of Federal, State and Local funding sources, including the Natural Heritage Trust - Envirofund Stages I and II, Border Rivers-Gwydir Catchment Management Authority, Greening Australia - Green Corps, Community Mutual Group, Caring For Our Country, Be Natural Landcare Program and Northern Tablelands Local Land Services, Uralla Shire Council, Department of Land and Water Conservation, Greencorps, New England Weeds Authority, Green Reserve Program, Southern New England Landcare, NSW Soil Commission, Country Energy (now Essential Energy), Citizens Wildlife Corridors Armidale Inc., Joblink, Jobs Australia, Best Employment, Fields Native Nursery, State Rail, Uralla Central School, St. Joseph's Primary School, Northern Tablelands Local Land Services, Richardson's Hardware, Suzanne R. Hudson, Les Townsend (Aboriginal senior & custodian of Anaiwan people), National Parks & Wildlife Services, Uralla Visitor Information Centre and Uralla Neighbourhood Centre.

The Present - Taking Stock

Uralla Sub-Catchment Management Review

As described in previous sections of this document, URG has undertaken activities along significant portions of Uralla creek over the years.

Monitoring and Current Status

URG has two members who monitor all project sites on a three monthly basis, taking stock of the creek's current condition, while recording plant growth and plant losses. As a result, regular working bees are planned for sites requiring weeding or seedling replanting or follow-up poisonings, which are typically carried out in spring and summer to control willow regrowth.

Of course monitoring has shown that some sites have been more successful than others, but it has also identified how much the creek has improved and what the URG and the community have achieved. A description and summary of the remediation achieved at each of the 16 project sites is presented below.

Further information and updates regarding Council activities on the creek can be obtained from Council's up-to-date version of "The Uralla Sub-Catchment Management Review".

Creekland sites and projects which have involved remediation and/or revegetation by URG, private landholders and Uralla Shire Council have been reviewed most recently by "The Uralla Sub-Catchment Management Review" (Southern New England Landcare, 2014). Sixteen sites (see Map) are detailed in the above Review and recommendations have been made for future activities at each site. The Review belongs to the Community and is being kept current by Uralla Shire Council, who use the Review as a working document, to guide planning and operations, as well as facilitate co-operative and efficient joint activities of Council and URG.

URG has undertaken activities at a selection of the sixteen sites dealt with by the The Uralla Sub-Catchment Management Review. This selection of sites reflects the historical development of URG and the sites we chose to work on, and variations in the availability of funding, labour and other resources.

As at 2016, URG continues to carry out **maintenance on Sites 5, 6, 8 and 9**. This maintenance includes:

- control of grasses by regular fortnightly mowing in spring and summer and less frequent mowing in cooler months;
- weed control, utilising a combination of hand weeding and spraying, with chemical only being used where hand weeding is difficult or ineffective (e.g. for bamboo and blackberry);
- monitoring of plantings, with autumn being a good time to prune back natives, check on larger trees and stake and tie up any that are not straight, assess whether any re-planting is needed at any of the sites and check vine-type weeds are not becoming invasive.

Regular working bees are planned around the planting sites to weed and replace any plant losses. Some planting sites have been more successful than others and the Group is learning all the time. Follow up poisonings are carried out in spring and summer to control willow regrowth in the waterway and along the banks.

A summary of past and present activities at each of the creekland sites is presented on the following page. Further information and updates regarding Council activities can be obtained from Council's up-to-date version of the Review.

• *URG Activities at Creekland Sites Specified in The Uralla Sub-catchment Management Review (2014)*

Site 1

This site is on private property south of Uralla, toward the top of Uralla Sub-catchment. Since 2007 it has undergone major earthworks to address extensive gully erosion. The affected landholder, has managed the improvement works at this site and has contributed significant resources to the restoration of this site. In particular, the removal of over 100 mature pine trees has improved the groundcover on the creek bed and banks, increasing the potential for revegetation with native plants. Exotic weed control, including revival of in-stream willow, is continuing.

Site 2

This site is primarily located on one private property with the exception of a small section of Council land between the western private property boundary and Shannahans Bridge. The present landholder planted willows and pines many decades ago to stabilise serious bank erosion. For over a decade the landholder has been revegetating an extensive area adjoining the creek with native plants and gradually removing willows in and along the creeks. The site has good potential for natural regeneration once the weedy over-storey is gradually removed. URG has not been involved with this site.

Site 3

This site is located downstream of Shannahans Bridge and is owned and managed by Uralla Shire Council. Weed removal and revegetation works have occurred at this site, with willow control and revegetation work occurring being funded by State and Federal Government programmes. The last such funded work occurred in 2013. In 2014-2016 Council carried out follow up willow control and poisoned poplar suckers. URG has not worked on an ongoing basis at this site.

Site 4

This site is privately owned and ownership has changed since works began at this site in 2003. URG, Country Energy and Uralla Shire Council, with funding support from the NSW Environmental Trust Envirofund, have contributed to the management of this site. Willow removal has occurred with varying degrees of success. Initial work resulted in such a dense thicket of in-stream regrowth, from either ineffective poisoning or debris left on-site, that it impeded high flows. This regrowth was eventually controlled but further willow and woody weed control is required on the creek banks. Revegetation with native species on both creek banks would enhance this site and link revegetation to other sites. This site is not a high priority for future URG activities.

Site 5

This site runs downstream from the bottom of East Street to where the Park Street Reserve meets Duke Street. It is primarily located on public land until its downstream end, where private properties resume on the eastern bank. URG, with assistance from Uralla Shire Council, has successfully managed restoration works and maintenance of this site since 2002. The URG continues to work at this site and would like to see the Uralla Creek Walk extended so that it begins at the southern end of this site and connects the southern side of Uralla with the central business precinct. While willows have largely been controlled here, several old willow trees remain on the bank and, as access to these trees would be from Duke Street or through the private properties, these trees have been included in Site 5 rather than Site 6.

Site 6

This site includes the western end of the Park Street Reserve from Maitland Street down to the creek, and the riparian zone on private property following the creek from the Reserve through to Maitland Street. The fenced 'Park Street Wildlife Corridor', which is the current start for the Uralla Creek Walk, runs along the drainage line from Maitland Street to the Creek.

Significant willow and exotic weed removal have been undertaken along this stretch of creek, with about 25 m of primary control remaining to be done at the northern end. Major creek stabilisation works have also been successfully completed at this site. However, the property adjacent to this site on the south-western side (fronting onto Maitland Street) is being developed and has experienced significant soil disturbance.

URG started their on-ground works at this site in 2000 and the site continues to be managed by the Rivercare Group.

Site 7

Porter Park is in a prominent position behind the Tourist Information Centre and Council Chambers. It is a public park managed by Uralla Shire Council. The riparian area here has been the subject of significant erosion control measures to stabilise the creek before it passes under the New England Highway. Extensive exotic weed control and revegetation with native plants have also occurred here and the site is considered a show piece example of the riparian restoration work that has occurred in Uralla. URG have no ongoing commitment at this site.

Action on site

SITE 4

Willow removal East Street Site



BEFORE



AFTER



2004 plantings on private land at East Street an Walcha Road junction (Serene Phillips) stage 3 Uralla Rivercare Group 75% plant loss due to lack of access to watering, but reasonable survival rate as above for re generation, this site could be replanted providing plants were kept watered as it is private land. Watering would have to be by hand bucket method from creek water.

Arrow indicates metal fencing around old well pit.

SITE 5

BEFORE photos of Walcha Road plantings



BEFORE 2016 Walcha Road Duke Street plantings



AFTER 2016 Walcha Road Duke Street plantings



East Street after willow removal



Road side site beside McGraths property, poor survival rate here due to lack of watering...site could be replanted in the future

SITE 6

Maitland Street Before Fig. 1 & 2



Figure 1



Figure 2



Figure 3 Maitland St., Rock Ramp Scheuberger After

SITE 7

Porter Park



SITE 8

Green Corps team



Green Corps Team Rear of shops Before



Green Corps Team Rear of shops After



Green Corps Team Before



Totems at Park Street

SITE 9

Habitat for water rats.....
bamboo irradiation project

BEFORE



AFTER



Site 8

This site stretches for 400 m downstream of the New England Highway bridge culvert and is primarily on private property, with a small section of public land at the bridge culvert. URG has significantly improved and managed this site since the beginning of works in 2007, when the Rivercare Group were successful in their application to receive assistance from a Green Corps team. Thus the first area of planting is referred to as the 'Green Corps Site' while the remaining stretch has attracted funding from the Border Rivers-Gwydir Catchment Management Authority Targeted Project, the High Country Urban Biodiversity (HiCUB) Project and most recently a National Landcare Program 'Be Natural' Grant. URG has also received assistance from several 'Work-for-the-Dole' participants who have performed regular maintenance of plantings and weed control. URG would like to extend the Uralla Creek Walk through Sites 8 and 9, however insurance and ownership issues require resolution.

Site 9

Site 9 is on private property and is managed by the landholder and URG.

Site 10

This site is east of the very northern end of Salisbury Street, extending north of the confluence with Rocky Creek and consisting of several privately owned properties. A clear vision for this site is yet to be developed by any interested stakeholders. URG have no ongoing commitment at this site.

Site 11

This is 'The Glen', a large public site on Rocky Creek, which is managed by Uralla Shire Council for passive recreation. This site includes picnic facilities, public art installations and mown walking areas. There is a long history of restoration works at this site, with extensive native plantings established by Greening Australia. Some areas are remnants of a Ribbon Gum – Mountain Gum Grassy Woodland with diverse naturally regenerating indigenous groundcover and trees. These remnant areas may qualify as part of the Ribbon Gum-Mountain Gum-Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion endangered ecological community. URG has not worked on this site.

Site 12

This site is upstream of 'The Glen', on the northern side of Barleyfields Road. It is owned by one landholder but is backed onto by several other landholders who overlook the creek lands. This site contains patches of regenerating remnant native vegetation including native grasses and groundcover plants. Long stretches of the creek are lined with mature, multi-stemmed Pussy Willows which were planted in the past to address creek bank erosion. A retention basin is present in the creek channel toward the top of the catchment. Other exotic weed species present requiring control include Honeysuckle, Bamboo, Hawthorn and Pyracantha. URG has not worked at this site.

Site 13

Site 13 is the public land at Alma Park, located along Rocky Creek. This historical park was reserved as land for "public recreation" in 1855. It contains a diverse mix of mature evergreen and deciduous exotic trees and a recently established strip of native vegetation on both sides of the creek. Significant creek stabilisation structural works as well as weed removal and native plantings were undertaken in the park as part of the HiCUB Project during 2008-2012. Alma Park is managed by Uralla Shire Council and URG has been involved with this site at times.

Site 14

This site is on Rocky Creek and stretches from Hill Street behind the Uralla Bowling Club to the confluence of Rocky Creek and Uralla Creek. It consists of private land.

Site 15

This site is located on Mount Mutton and includes a Crown Reserve and closed road reserves managed by Uralla Shire Council, as well as a disused Travelling Stock Reserve. 'The Mount Mutton Bush Regeneration Plan 2012-2022, Version 2' contains detailed background information about this site and provides a guide for weed control and revegetation activities. The plan is reviewed annually and adjusted to reflect any significant changes in the biophysical environment, or in community and Council priorities or regeneration strategies. Community volunteers contribute to management of this site during monthly working bees led by Council. URG has not worked here and has no ongoing commitment at this site.

Site 16

This is a relatively new site and includes the private property on Rocky Creek downstream of The Glen and New England Highway to the start of Alma Park. URG has not worked here. It is yet to have any improvement works undertaken.

Remediation and Revegetation Summaries

A summary of the efforts made by the URG and the various contributing stakeholders, along with the native vegetation species planted are provided in the tables below. These figures are estimates but are indicative of the significant undertakings associated with the remediation of what is a relatively short reach of stream that had extensive degradation issues

Remediation effort and works summary

DESCRIPTION	AMOUNT
Stream length cleared of woody weeds	2100m
Number of native seedlings planted	16000
Amount of debris and rubbish removed Estimated	1000m ³ to 3500m ³
Rock riffles or bed control structures / quantity of rock	5 / 1,500m ³
Rock revetment bank stabilisation / quantity of rock	200m / 400m ³
Distance of Uralla Creek Walk established	1km
Awareness signage and totems	8 totems 1 major sign in Alma Park 17 numbered bollards
Planning documents and publications developed	6
Total Green Corps assistants	15
Total Work-for-the-dole assistants	26
School children involved	500
Number of URG and general community contributors	12
Estimated hours of volunteer labour	4000
Community & in-kind contributions (includes Uralla Shire Council, Essential Energy) estimated	\$50,000.00
Total government funding contributed (includes 2 x Enviro Trust grants, BRGCMA funding, CWC, HiCub funding, Community Action Grant, Be Natural Grant, Green Corps grant, ILS grant	\$344,000.00

Revegetation species list for Uralla Creek

SPECIES	COMMON NAME
Acacia melanoxylon	Blackwood
Acacia siculiformis	Dagger Wattle
Callistemon ptyoides	Alpine Bottlebrush
Carex appressa	Tall Sedge
Eleocharis acuta	Common Spike-rush
Eleocharis pusilla	Small Spike-sedge
Eleocharis sphacelata	Tall Spike-rush
Eucalyptus nova-anglica	New England Peppermint
Eucalyptus pauciflora	Snow Gum
Eucalyptus stellulata	Black Sally
Leptospermum polygalifolium	Tantoon Tea-tree
Lomandra longifolia	Mat-Rush
Schoenoplectus validus	River Clubrush
Casuarina cunninghamiana	River She Oak
Acacia floribunda	Gossamer Wattle
Hakea salicifolia	Willow Leaved Hakea

Current Status of the Creek

As a result of many volunteer hours of effort and significant financial contribution, the URG has dramatically improved the condition of Uralla Creek. The once highly degraded stream, is now more stable, more diverse, environmentally healthy and is considered an attractive natural resource by the community.

While the URG acknowledge that there is still much to be done to achieve their goals fully, the main aspects of improvement in the condition of Uralla Creek are clearly visible and include:

- fewer infestations of environmental weeds that reduced instream exotic vegetation that was previously obstructing stream flow;
- significant plantings and regenerative stands of native vegetation have provided increased species diversity and coverage of indigenous vegetation along the creek.
- a relatively stable creek channel that is no longer scouring, deepening, or widening, thanks to rock structures that protect and control vulnerable alluvial sediments;
- improved habitat for both terrestrial and aquatic flora and fauna, with increased diversity and opportunity for establishment; and
- improved water quality with less pollution and fewer sedimentation occurrences instream and in association with creek crossings and debris.

The Future - 'Looking Forward'

URG's Current Goals

Having come so far in achieving significant improvement in Uralla Creek over nearly two decades, Uralla Rivercare Group has recently re-evaluated its goals to help identify where the group should focus future efforts. As it happens the current goals of URG have not significantly changed, although there is more of a focus on biodiversity, but include:

- continuing to re establish native riparian communities;
- increased flora and fauna biodiversity throughout the creek system
- maintaining a stream that provides recreational and aesthetic appeal.

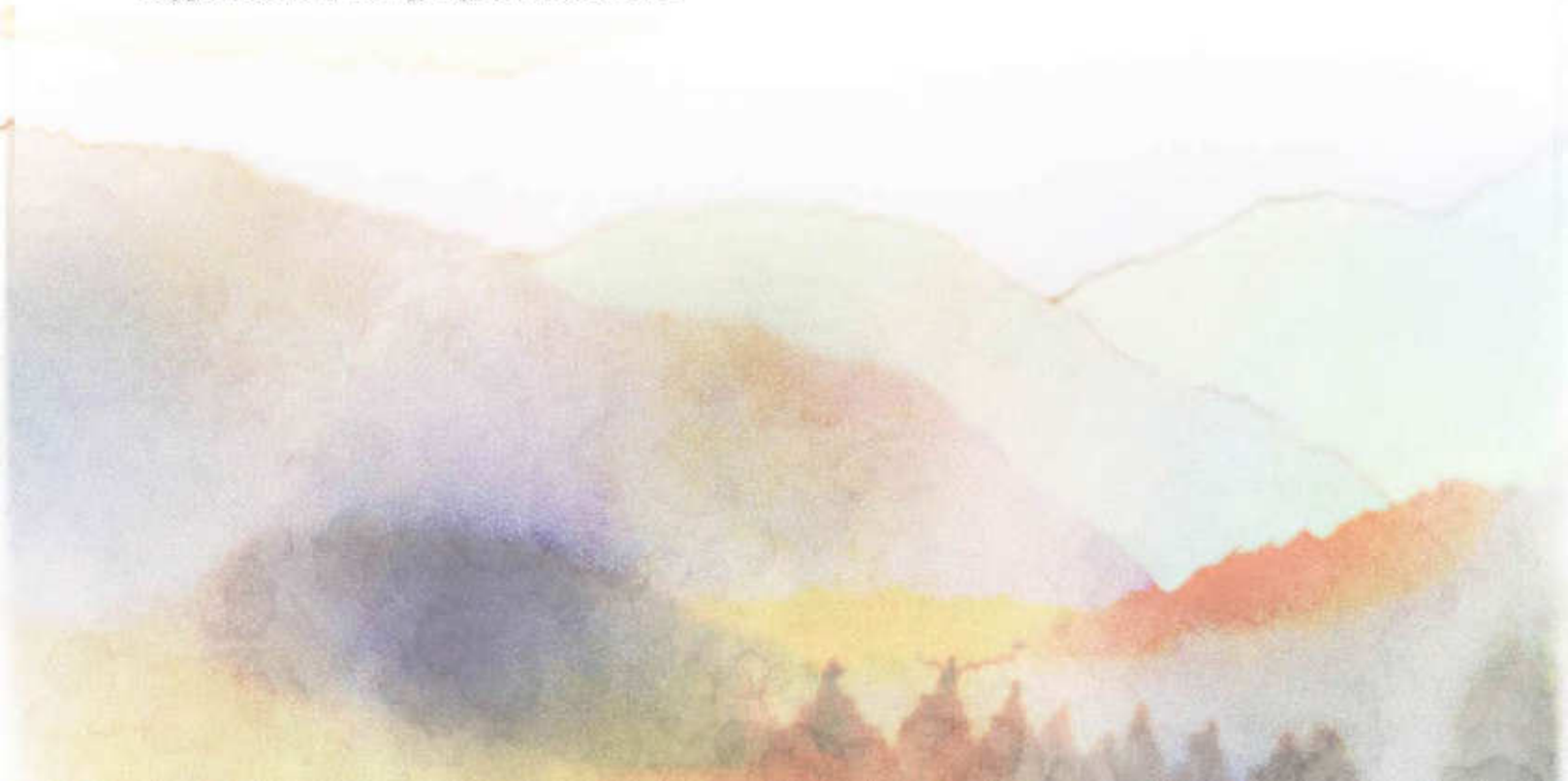
URG's Priorities

In striving for these goals URG's priorities are to :

- save stream sections that support valuable organisms and communities before turning to less valuable reaches that support common organisms and communities;
- protect the stream sections that are in the best condition before trying to improve those that are in poor condition;
- stop streams from deteriorating rather than waiting and then trying improve those that are in poor condition; and
- if working on stream sections in poor condition, beginning with those that are easiest to fix.

URG can only work on lands where landholders wish to co-operate to improve the creek and adjoining riparian areas. However, URG anticipates continuing to work to repair damaged creek beds and banks, remove inappropriate vegetation from the Creeklands and replace it with native plants suited to riparian restoration and provision of habitat for native wildlife. While restoring degraded creek lands in environmentally responsible ways we also endeavour to work harmoniously with others and be socially responsible.

We wish to facilitate long-term maintenance of repaired sites and gradually help to create a continuous stretch of healthy riparian environments along their length through Uralla. The following sections make suggestions for the ongoing activities of URG.



On-ground works and projects for immediate action by URG

- Continue maintenance activities at Sites 5, 6, 8 and 9.
- Continue to help private landholders by providing information or other assistance.
- Review rock revetments at existing rock revetment sites by obtaining expert inspections and advice on these and other structures on both public and private lands – see table below.

Maitland Street	Schuberger ramp	Constructed in 2001
Bridge Street rear of shops	Rock riffles	Constructed in 2009
Rear Bushranger Motel	Rock revetment wall	Constructed in 2010
Rear 43 Salisbury Street	Rock revetment wall	Constructed in 2010
Queen Street Causeway	Rock ramp	Constructed in 2012
Maitland and Park Street	Stormwater rock drain	Constructed in 2012
Alma Park	Rock ramp below footbridge and rock revetment walls on riparian zone of creek towards Hill Street bridge	Constructed in 2012

Processes and partnerships URG could be clarifying and developing

- a. Building on and utilising existing partnerships with Uralla Shire Council (USC), Southern New England Landcare Ltd (SNElandcare) and the Northern Tablelands Local Land Services (NTLLS).
- b. Ensuring that communication and partnerships facilitate the development of URG protocols and work methods, especially on public land sites, which meet the regulations or other requirements of bodies such as USC, Environment Protection Agency, New England Weeds Authority, NSW Fisheries, etc.
- c. Listing the public land (Council) sites on which URG will work.
- d. Describing how URG will carry out their work on public land, e.g.
 - voluntary in-kind work and use of equipment or other resources;
 - facilitating works supported by grants or expert advice sought by URG alone or in conjunction with Council or other partners.
- e. Listing the sites under private ownership at which URG will continue to work and establish how URG could support privately owned sites;
- f. Listing the public land (Council) sites on which URG will work and engage with USC to:
 - develop work protocols to ensure that URG work complies with local government needs;
 - foster good relationships with USC management and outdoor staff;
 - establish how URG will carry out their work on public land e.g. voluntary and in-kind work, with use of equipment or other resources may be one approach, while works can also be supported by grants or expert advice sought by URG alone or in conjunction with Council or other partners: and
 - Identify specific sites and review current management ideas, including:
 - develop a Waterways Maintenance and Rehabilitation Masterplan (WMRM), that would provide a coordinated and agreed maintenance and rehabilitation program for waterways in Uralla. The WMRM's aim would be to maintain the ecological integrity of the systems while increasing access and recognising the need to manage flooding, heritage issues, etc. (This may involve handover of some URG sites to USC for ongoing maintenance)

- complete plantings along the top side rear of 39-45 Salisbury Street down to the causeway at Queen Street, as well as the removal or spraying of blackberry at the creek junction and causeway;
 - develop a crossing at Duke and Park Streets to connect the Walcha Road foot bridge with the existing Uralla Creek Walk;
 - further rock revetment and Lomandra planting on the eroding bank near 43 Salisbury Street; and
 - reshape the stormwater drain outlet into the creek and adjacent area at the URG site at Park and Maitland Streets to improve drainage and revegetate with creek bank plantings;
- g. Establish a maintenance plan for any new plantings, as follows:
Control of Groundcover - Regular fortnightly mowing during spring and summer, then less frequently in cooler months. URG to encourage private landholders to control weeds and can assist with chemical use if needed. URG to encourage private and commercial landholders to keep sites mown
- h. Listing sites
 URG needs to discuss with Council, meeting with Council staff, regarding:
- integrating URG and Council activities to maintain rehabilitated riparian sites, or undertake new riparian projects, utilising the 2014 The Uralla Sub-catchment Management Review as a 'masterplan' (and taking into account the need to manage flooding, heritage issues, infrastructure maintenance, etc.);
 - reviewing current site management;
 - discussing USC possibly taking over previous project works of URG;
 - discussing site-specific ideas URG has and would like to share with Council, including
- i. completion of plantings along top side rear of 39 to 45 Salisbury Street down to the causeway at Queen Street, and the removal or spraying of blackberry in the riparian zone at the creek junction where the waterway runs under the causeway;
- ii. development of a pipe system to double as a crossing at Duke and Park Streets to connect the Walcha Road foot bridge with the existing Uralla Creeklands Walk – to give walkers access to the town main precinct and shopping centre;
- iii. attending to the rock revetment at the rear of 43 Salisbury Street, to follow up inspection findings of July 2016 - where the land owner has mass planted Lomandra, in an effort to retain the land, flooding in June 2016 has caused further erosion and more Lomandra need to be planted in to retain this site (N.B. this site needs further rock retainment to prevent further erosion and sediment build up in the creek);
- iv. works at the URG site at Park and Maitland Streets to reshape the land (so the cut is lower than the channel and water can run off without causing further damage) and revegetate with plantings on the creek bank and top side.
- i. Listing the sites under private ownership at which URG will continue to work.
- j. Describing how URG could support privately owned sites.

k. Establishing maintenance plans for any new works, such as outlined below.

CONTROL OF GRASSES	WEED CONTROL	MONITORING OF PLANTINGS
<p>Regular fortnightly mowing during spring and summer. Less frequently in cooler months.</p> <p>URG to encourage private land holders to control weeds and can assist with chemical use if needed.</p> <p>URG to encourage private and commercial landholders keep sites mown on a regular basis, as required or can offer to assist if needed.</p>	<p>Combination of hand weeding and spraying, cut and paint or scrape and paint chemical to control bamboo, blackberry, hawthorn, variegated ivy, honeysuckle and periwinkle on creek banks. Best in autumn and spring.</p> <p>URG to encourage private and commercial landholders to control weeds and can offer to assist with chemical spraying if needed, by arrangement.</p>	<p>Autumn is a good time to prune back natives, check on larger trees and shrubs and stake and tie any that are not straight.</p> <p>Also assess survival rate and whether any replanting is needed at any of the sites. Check vine type weeds are not becoming invasive.</p>

l. Applying, in partnership with other organisations, for funding to continue enhancement projects along the Uralla Creeklands – as guided by outcomes of a.- k. above and utilising support from community consultation activities.

What resources could be accessed to support projects?

URG could maintain and/or develop:

- partnerships with organisations such as USC, SNElandcare, Northern Tablelands LLS, New England Weeds Authority, State and Federal funding bodies, local contractors, private and commercial landholders; and
- relationships with experts who can provide technical advice and/or facilitate URG activities.

What constraints need to be managed?

Potential constraints which require addressing include:

- regulations, workplace health and safety issues and/or insurance matters for bodies such as the Environmental Protection Authority, NSW Fisheries, New England Weeds Authority, USC;
- legalities of chemical use and workplace safety - URG need always to ensure that all volunteers are (a) informed of the legislation regarding chemical use, and (b) aware of and complying with all workplace health and safety regulations.;
- the possibility that previous works could become so overgrown that they are unknown or cannot be recognised;
- preferences of private and commercial landholders to maintain good working relationships with all landholders understanding both their concerns and their preferences for the vegetation and use of their land.
- limitations on volunteers time, schedule activities to make best use of time they have available.
- expertise , the science of natural resource management is ever growing and changing and URG must have in place ways to ensure planned works are in line with current knowledge;
- funding – URG has no funds of its own and need to keep up to date with current sources of funding to carry out any projects.
- use of 'Work for the dole' teams always need a supervisor and requirements such as paperwork often interferes with time constraints and prevent planning for projects.



Stakeholder Engagement

To assist with the ongoing remediation of Uralla Creek, URG recognises the importance of engaging with interested parties and stakeholders to foster resources to support project works, as well as improve community engagement. To this end, URG aims to:

- further develop partnerships with Uralla Shire Council (USC), Southern New England Landcare Ltd (SNELC) and the Northern Tablelands Local Land Services (NTLLS);
- provide guidance and supporting information to landholders with creek frontage, as well as improve community awareness of the benefits of looking after our creeks at Uralla; and
- maintain relationships with experts who can provide technical advice and/or facilitate URG activities.

Animals of the creeklands

Eastern long-necked turtle (*Chelodina longicollis*)

This is the most widespread species, occurring in water bodies throughout NSW with the exception of the highest parts of the Alps. It is easily distinguished by its wide plastron (the under part of the shell), made up of pale yellow shields with black margins. It is often seen crossing roads, where unfortunately it is frequently killed by motor vehicles. When handled it exudes a smelly secretion that helps to repel predators.

It is a carnivorous species, feeding mostly on small invertebrates such as worms, snails and insect larvae, including mosquitoes.



Eastern water dragon

The Eastern Water Dragon is a large lizard. It is grey brown with black banding and a crown of spines from the crest of the head. Males often have a red belly and chest. It is a good swimmer and dives into water when disturbed. It can remain submerged for around half an hour. Total length up to 80cm including tail. Head and body length 20-25 cm. Its habitat is near creeks, rivers and lakes in forests, woodlands, grasslands and also parkland in urban areas. Usually seen on rocks or overhanging branches basking in the sun.

The water dragon feeds on insects, molluscs and crustaceans as well as small vertebrates including fish, hatching tortoises and small mammals. May be seen scavenging around public picnic areas and it also eats fruit and berries.

The Eastern water dragon lays a clutch of 6-18 eggs in a shallow burrow. The female digs a shallow nest about 10-15cm deep in a sunny open position in a sandy soil. The female lies above the burrow and deposits the eggs into the chamber below. She then back-fills the burrow by scraping the soil with her back legs and then packing it down with her snout. Loose debris is then scattered over the nest area.

Range

Coast, ranges and hinterland of eastern Australia.



Platypus

About half the size of a household cat, adult males and females can differ greatly in size and weight. The average male platypus is about 50 cm long (head to tail) while females measure about 43 cm. Platypuses are dark brown on their backs and generally light brown on their bellies. Under their long, coarse outer hair is a fine, dense underfur which is woolly in texture. This fur ranges in colour from grey to dark brown.

With their slightly flattened, streamlined body and short, stout legs, they are well-adapted for swimming. The forelegs push the animal through the water, while the hind legs trail behind, acting as stability rudders. When digging a burrow or moving on land, platypuses can fold away their webbed foot extensions. The name 'platypus' means 'flat feet'.

The platypus has no outer ear lobe, and both its eyes and ears close when it dives. It has very sharp vision over long distances, but because its eyes are towards the top of its head it cannot see objects directly under its nose. The duck-like bill of the platypus is a flexible, soft and very sensitive organ. It helps the animal to find its way about and to search for food, picking up electrical discharges from its prey. Although it has no teeth, the platypus uses grinding plates on the upper and lower surfaces of the jaw to chew its food.

The platypus keeps its body temperature constant by controlling the heat produced from metabolism (all the chemical reactions that occur in the body). It can reduce blood flow to areas of its body that have no fur - particularly its tail, rear feet and bill. Its fur is waterproof and traps an insulating layer of air next to its skin. The platypus and the two species of echidna are the world's only monotremes, or egg-laying mammals. The name 'monotreme' comes from the fact that these animals have only a single opening for reproduction and getting rid of body wastes.

When the first platypus specimen was sent to England for identification, its appearance was so strange that it was thought to be a hoax. An animal that had a muzzle like a duck's bill and carried a tail like a beaver was said to be an impossibility. Since then, scientists have come to accept that this Australian native is very real. But it's something of a rarity.

Platypuses commonly live in the rivers, streams and lakes of eastern Australia, from the Annan River in northern Queensland to the far south of Victoria and Tasmania. They are found in the major permanent river systems in the south of NSW, west of the Great Dividing Range, and occasionally in South Australia.

Out of the water, platypuses spend most of their time in burrows which have been dug into the river bank, with their entrances usually above water level. The animals use a number of short resting burrows (three to five metres long) as protection from predators and temperature extremes. Burrows used for nesting tend to be more elaborate, with many side branches.

Mainly a nocturnal animal, the platypus can best be seen during the early morning and late evening. It spends about half its time in the water feeding. In fact, it can spend up to 10 hours in the water at any one time. Normally a platypus stays underwater for between one and two minutes, but if disturbed it can stay underwater for up to 10 minutes.





The platypus usually catches its food underwater, sifting through the gravel and mud of the riverbed. A great deal of mud can be consumed in this process. The platypus fills its cheek pouches with unchewed food, and when it has finished feeding it rests on the water surface to grind and swallow the food. Its diet consists mainly of riverbed animals such as insect larvae. However, it also eats freshwater shrimp, and may catch adult insects on the surface of the water.

Platypus breeding season is in spring, running from October to March in NSW. The animals build a nesting burrow up to 30 m in length, containing a nesting chamber. This chamber is about 30 cm square and is packed with vegetation. Before she lays her eggs, the female platypus plugs the burrow in one or more places. This may serve both to protect the mother and her eggs from predators, and to keep the nesting chamber at a stable temperature and humidity level.

Between one and three leathery eggs are laid. They are incubated by the mother, who curls around the eggs with her tail laid over them. When the young platypuses hatch, they are fed milk by their mother. Because platypuses do not have teats, milk is transferred from the mother's mammary glands to the skin, and the young suckle her underbelly fur. The young are suckled in the burrow until about three or four months of age, when they venture into the open to see daylight and the river for the first time.

Yabby traps can harm wildlife such as platypuses, turtles and water birds.

Keeping out of danger

Platypuses are shy animals, and will usually dive underwater to swim away from an attacker. However, if unable to escape, male platypuses will try to stab an attacker with hollow spurs on their hind legs. These spurs are connected to a sac containing poison strong enough to kill a dog. Like echidnas and most other native Australian animals, platypuses are protected under the *National Parks and Wildlife Act 1974*.

Frogs

With more than 200 species, Australia has one of the most diverse range of frogs in the world. Refer to World Heritage and Environment web site for further information.

Where do they live?

Frogs live in the most varied of our country environments, from rainforests and mountains to deserts. However, they are sensitive to change in their environment.

Most common frogs live in or around fresh water. Many need water to breed, although a small puddle can be enough. Their thin, permeable skin is not waterproof, which means they can lose a lot of body moisture on warm days. For this reason, frogs are most active at night, when they will hop about in search of food or a mate. During the day, they find a hiding spot and wait until the heat and light of the sun have passed. The thin, porous skin of frogs and tadpoles makes them sensitive creatures. Through this skin, they absorb chemicals from the air and water. For this reason, frogs are good indicators of environmental damage. If you hear many frogs in an area, it means that the local environment is likely to be unspoiled. However, in areas where water or air pollution have occurred, the local frog community will be affected and there are likely to be very few frogs. On some mining and industrial sites, surveys of frogs in the local area have been used to detect accidental pollution of waterways.

Most people only realise that frogs are about when they hear them calling near a pond or stream. Each species makes its own particular sound, but the male frog does all the calling, to attract the females. If the female frog is also ready to breed, she will approach the male frog. He will climb onto her back (this embrace is called amplexus) and she will carry him to the egg-laying site. As she releases her eggs, the male frog releases sperm over the eggs. Fertilisation occurs outside of the female's body, usually in pond water. The fertilised eggs develop and hatch to produce tiny tadpoles, which grow and develop into frogs over a period of months. This change from tadpole to frog is called metamorphosis. The process involves not only the loss of the tail and the growth of legs and arms, but also the replacement of the tadpole's internal gills with lungs. Its digestive system also changes, to cope with a diet of insects rather than algae and decaying animal matter. The aquatic tadpole metamorphoses into a land-dwelling frog.





Water rat

Water rat Photo:EHP

Common name: water rat

Scientific name: *Hydromys chrysogaster*

Family: Muridae

Conservation status: This species is listed as Least Concern in Queensland (Nature Conservation Act 1992). It is ranked as a low priority under the Department of Environment and Heritage Protection Back on Track species prioritisation framework.

Many of us have had the nasty experience of hearing a house rat gnawing at night: this is an undesirable feral animal which can spread disease. In contrast, Australia's water rat, while in the same family, is an attractive native animal. The water rat is well adapted to its watery world. It has a relatively large streamlined body (body length up to 40 cm), small ears and eyes and abundant whiskers. The upperparts can vary from grey-brown to rich golden brown to blackish in colour, while the underparts are cream to golden-orange. Its hind paws are webbed and it has a flat furry tail that acts like a rudder and usually has a white tip. It has glossy water-repellent fur that protects it from the cold.

The water rat is generally found in permanent fresh or brackish water, including freshwater lakes, streams, swamps, dams and urban rivers. It is one of only two Australian mammals living in fresh water (the other is the platypus).

The water rat has a wide distribution and can be found in Queensland, New South Wales, Victoria, Tasmania, the southern coast of South Australia, and coastal regions of Western Australia and the Northern Territory. The water rat spends most of its day in creek-bank burrows, but is mostly active around sunset when it comes out to feed, although it has also been known to forage during the day. It builds a grass-lined nest at the entrance to its burrow which is usually hidden among vegetation and built at the end of tunnels in banks of rivers and lakes.

Males are territorial and in areas with high population densities, it is common to see water rats with damaged tails as a result of fights defending their areas. The water rat is a fierce hunter, favouring tree-roots on river banks as regular feeding spots. It forages by swimming underwater and feeds on a wide range of prey including large insects, plants, crustaceans, mussels, fish, and small mammals and water birds.

Breeding can occur throughout the year, however most breeding occurs from spring to late summer. Studies have identified that social factors, individual age, and climate can also influence the time of breeding. Females usually breed when eight months old and can have up to five litters, each with three to four young each year. Young gain independence after eight weeks (Olsen 1995).

The water rat has adapted well to living with humans. It was formerly hunted for its fur, but it is now a protected species in Australia and populations appear to have recovered from the effects of hunting. However, current potential threats to the species include:

- Habitat alteration as a result of flood mitigation, urbanisation and swamp drainage.
- Predation by introduced animals such as cats, foxes and some native birds of prey.
- The young are also vulnerable to predation by snakes and large fish (Olsen 1995).
- Further studies into the taxonomy of this species are needed.



Map of Uralla Creek Remediation Sites



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