



Regreening the Cotter

A Decade of Community Repair Work in Our Water Catchment



ACT
Government

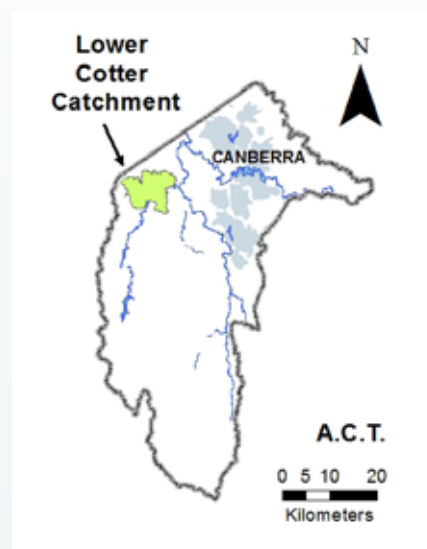
Greening Australia

Summary

In January 2003, bushfires raged through the forests of the western ACT and into the suburbs of Canberra. These bushfires were a traumatic event for the people of our region, taking the lives of four Canberrans and destroying the homes of hundreds of people.

The fires left a legacy in the psyche of locals and dramatically changed the landscape of the national capital. Over two-thirds of the ACT was burnt in the fires, including the forests of the Lower Cotter Catchment.

Following the fires, the Canberra community came together in an unprecedented show of goodwill to help others. Many in the community wanted to do more, to do something tangible to help repair the charred landscapes surrounding the city. Greening Australia and the ACT Government formed a partnership to engage the Canberra community in regreening the fire-affected areas.



The Lower Cotter Catchment was the focus of community restoration efforts due to the importance of the area as a water supply catchment. Reestablishing native vegetation can improve water quality and increase resilience to future fires. The native vegetation also increases the biodiversity values of the region, providing important habitat for native animals.

Over the past decade, volunteers from Canberra and the surrounding region have helped plant out over 500 hectares of the Lower Cotter Catchment. 306,343 seedlings from 62 species of native trees, shrubs and grasses have been used in this process. These areas are now growing into diverse native forests, ensuring better water for our future.

The community plantings have proved remarkably successful, with our monitoring showing average survival rates of nearly 80%.

Huge community events and small regular volunteer groups have all contributed their share to the cause. In total, nearly 15,000 people have been involved in this effort, dedicating 47,295 hours of their own time. These people have come from all walks of life, showcasing the diversity of our community. Through getting their hands dirty, volunteers from across our region have also formed a connection to this place and come away with a greater understanding of the importance this water supply catchment.

In all, the regreening of the Lower Cotter Catchment is an achievement of which our community can be incredibly proud.



“The three of us enjoyed our day out. Besides the planting of the trees, listening to the music, poetry and munching on food, I would also say how much I enjoyed listening to the Yurung Dhaura (Aboriginal) trainees , explaining their culture/food etc. They were very interesting and I look forward to hearing more about their lives past and future”

Summary of community volunteer works

On-ground	
Seedlings planted	306,343
Area revegetated (ha)	533.7
Number of plant species reestablished	64
Pine wildings removed	29,974
Community	
Community events	706
Number of participants	14,893
Number of volunteer hours	47,295
Monitoring	
Community planting plots monitored	108
Average survival of seedlings	78.9%



Background

Early history of the Lower Cotter Catchment

The Cotter River has played an important role in the history of the Canberra region in many ways. The river was used as a source of raw materials, including grinding stones, for Aboriginal people prior to European settlement. This region was a transit point for people making their way to the rich summer Bogong Moth feasts in the high mountains of the Brindabellas.

The river was a deciding factor in the post-federation debates about the location of the nation's capital. Such was its importance, the western border of the ACT is defined by the boundary of the Cotter Catchment. The river was the sole water supply for five decades during the city's infancy.

The Cotter became the main recreation area for hot summer days, and an important part of the ACT's softwood plantation industry.

Bushfire

At the beginning of 2003, the Canberra region baked through a hot, dry summer. On 8 January, lightning strikes ignited fires throughout the region. Many of these fires were extinguished by fire crews, but some were able to burn unabated in the rugged country to the west and north of the Territory.

During the next week and a half, these fires moved closer to the Bush Capital, and rapidly accelerated towards the city on 17 January when fanned by hot, dry winds.

On Saturday, 18 January, fire engulfed the western flanks of Canberra. Four people lost their lives in the blaze, and many more became temporarily homeless. Over 500 houses were destroyed. In the course of the fires, two-thirds of the ACT was burnt, including the forests of the Cotter Catchment.

Community response

In the days following the fires, the Canberra community reacted with shock and grief to the loss of life and destruction. But the devastation also brought people together, to find ways to help and support those affected. Donations of all types were forthcoming, along with an outpouring of generosity for fellow Canberrans affected by such tragedy.

As well as helping out where they could with their neighbours, many people wanted to do more. Canberrans have a close link with the surrounding landscape. The confronting sight of charred forests on the city's doorstep motivated many to want to pitch in.

Greening Australia and the ACT Government provided a constructive outlet for those Canberrans wanting to help repair their local bush and heal themselves in the process.



New forests created by the community

People power!

There were three major types of work needed in the charred landscapes of the Lower Cotter Catchment following the bushfire:

- planting native species
- removing weeds
- preventing soil loss

The ACT Government, as land managers through ACT Forests and the Parks and Conservation Service, undertook a range of works to address these problems.

The Government also recognised the ability of the community to help in this process, and the importance of the community being involved to give something back.

Getting your hands dirty

Since the initial partnership between Greening Australia and ACT Forests, community volunteers have undertaken a massive 706 on-ground events as part of the restoration works.

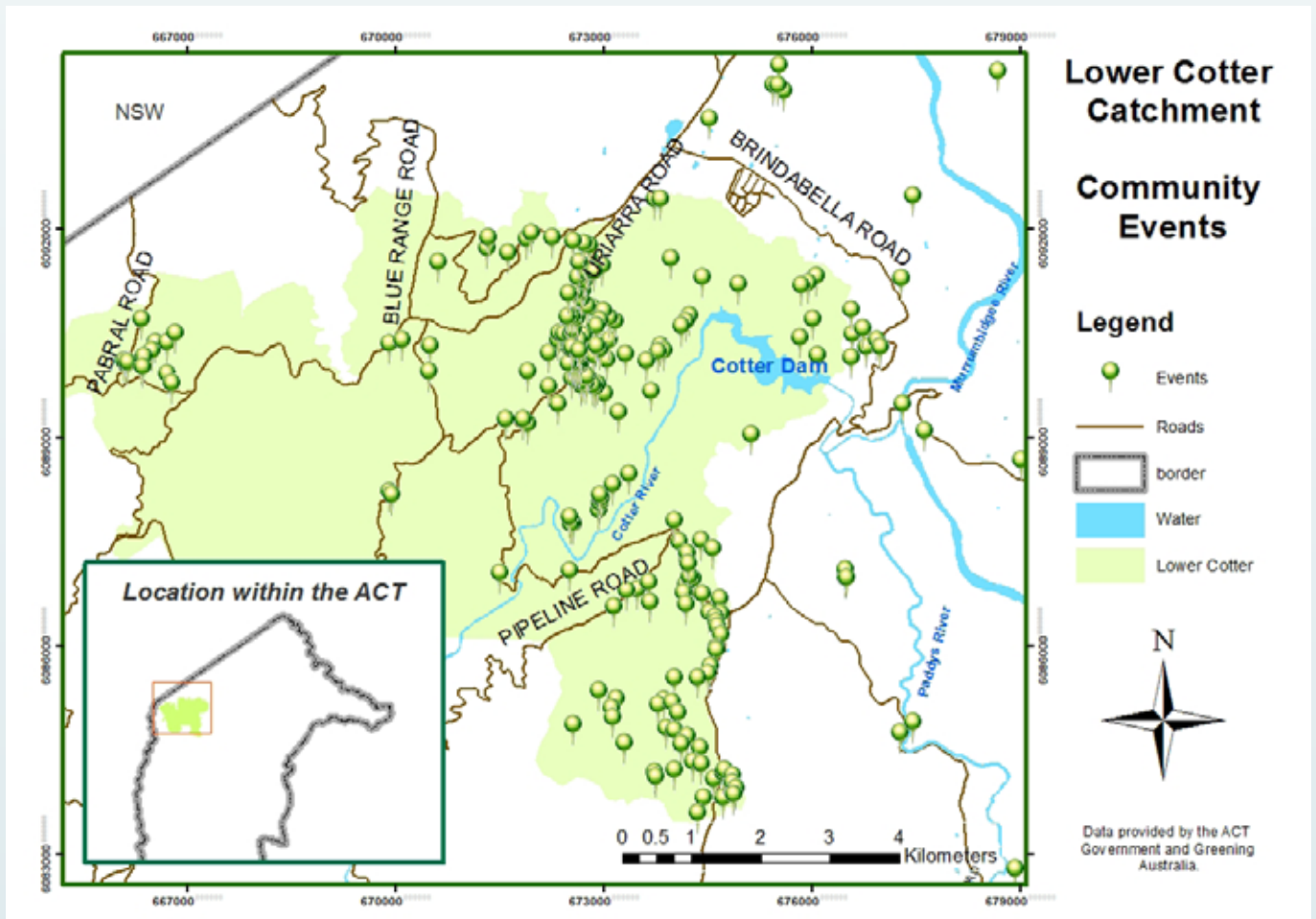
These have included a wide range of activities, from planting seedlings, distributing native seed, collecting seed for future revegetation efforts, removing weed species and follow up maintenance on planting sites.

Through these efforts, over 500 hectares of former pine forest is now growing into resilient, biodiverse native forest.

Weed removal

Though much of the community input has focused on planting native seedlings, just as important has been the efforts to control weeds in the area.

The resprouting of Radiata Pine trees has been one of the major weed issues in the area. The ACT Government has done a huge amount to remove these pine weeds, while volunteers have been instrumental in removing small pines before they grow into a big problem! To date, volunteers have removed nearly 30,000 pine trees, a truly remarkable achievement.

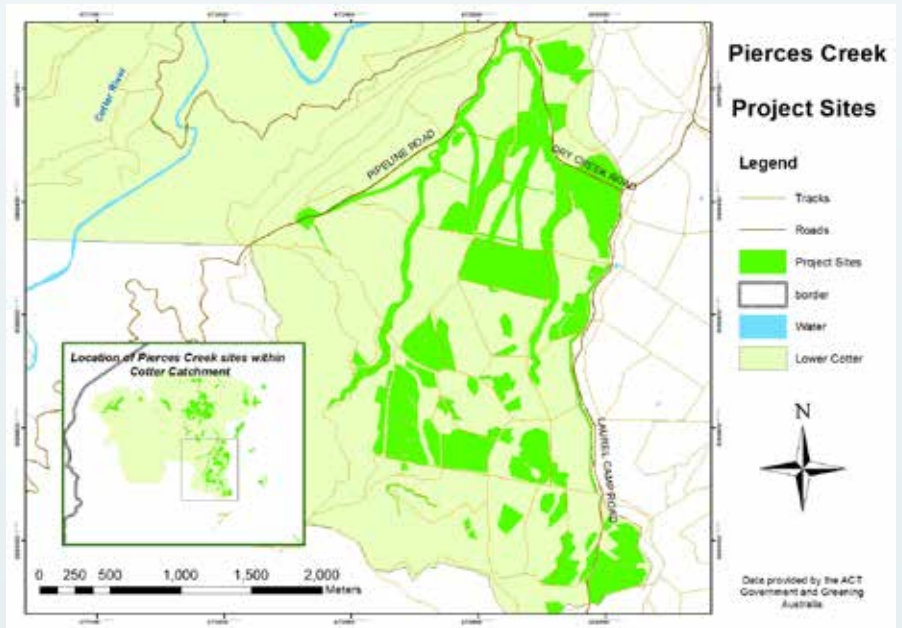
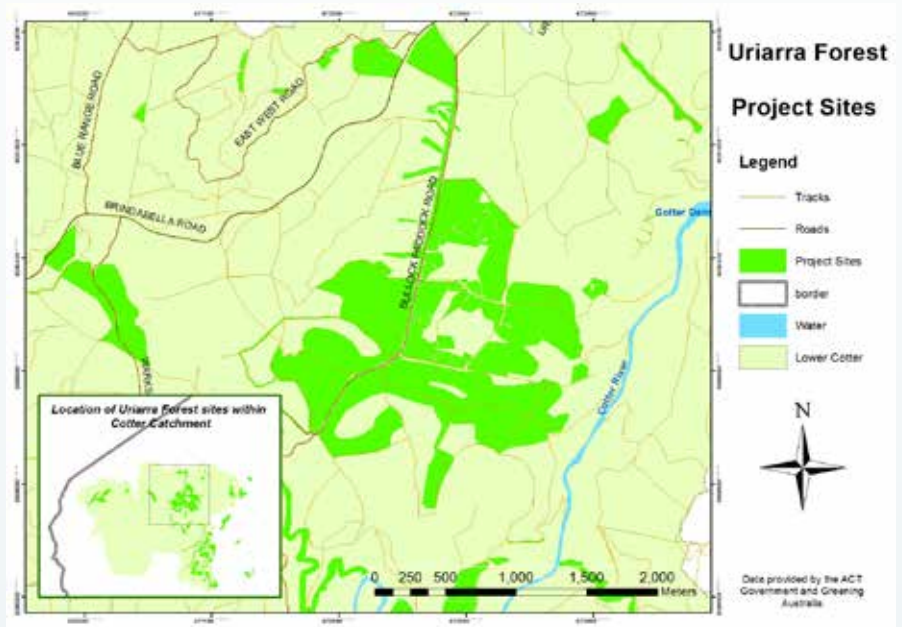


Focal areas for revegetation with native species

The initial magnitude of the burnt pine areas meant prioritisation was required for those areas most in need of assistance. This priority setting was based on a range of factors including:

- amount of naturally regenerating native vegetation
- history of land use - areas with longer history of agriculture and forestry were less able to regenerate naturally and had more weed pressures
- proximity to water courses
- erodibility of soils
- accessibility to volunteers

These factors led to selecting two major regions for the most intensive revegetation works. Uriarra Forest has the longest history of intensive land use in the Lower Cotter Catchment, with clearing for agriculture occurring in the late 19th century. Pierces Creek Forest on the other hand was predominantly selected due to the steep slopes and coarse sandy soils of the areas, which create a very high erosive potential, especially around the water courses.



The technical side of our revegetation efforts

The science behind the work

Shortly after the bushfires, a range of experts were engaged by the ACT Government and Greening Australia to provide guidance on the revegetation efforts. Formal land use planning changes and detailed scientific analysis took some time to complete, so initial recommendations for revegetation were focused on areas which would have lasting benefits regardless of future plans (e.g. streams).

By 2006, CSIRO scientists Rustomji and Hairsine had produced a detailed report on the variety of options for land use in the Lower Cotter Catchment, with water quality as the main focus. Due to the benefits for sediment yield, and biodiversity gains, resilient native forests were selected by the ACT Government as the most appropriate land-use for the Lower Cotter Catchment.



Reintroduction of groundstorey species

An important facet of the restoration works in the Cotter was focusing on groundcover plants, not just trees and shrubs. These grasses, forbs and sedges form a large part of the plant diversity in our local area.

Robust species such as Snow Tussock, Mat-rush and Paper Daisy were incorporated into regular planting days. More delicate species, including Chocolate Lilies, Bluebells and Billy-Buttons, were planted on separate occasions.

Native species planted by volunteers

Species for the revegetation works were determined on a site-by-site basis. Different species mixes were sometimes required even on the one site, due to aspect and topographic changes. Species mixes were also adjusted for the presence of natural regeneration, with species such as Shiny Cassinia (*Cassinia longifolia*) naturally regenerating so successfully that they were rarely planted.

Trees

Allocasuarina verticillata
Brachychiton populneus
Casuarina cunninghamiana
Eucalyptus blakelyi
Eucalyptus bridgesiana
Eucalyptus dives
Eucalyptus macrorhyncha
Eucalyptus mannifera
Eucalyptus melliodora
Eucalyptus nortonii
Eucalyptus pauciflora
Eucalyptus polyanthemus
Eucalyptus rossii
Eucalyptus rubida
Eucalyptus viminalis

Shrubs

Acacia buxifolia
Acacia dealbata
Acacia falciformis
Acacia genistifolia
Acacia implexa
Acacia melanoxylon
Acacia pravissima
Acacia rubida
Bursaria spinosa ssp lasiophylla
Callistemon sieberi
Cassinia longifolia
Cassinia quinquefaria
Daviesia mimosoides
Dodonaea viscosa ssp. angustissima
Dodonaea viscosa ssp. spatulata
Indigofera adesmiifolia
Indigofera australis

Leptospermum brevipes

Leptospermum continentale
Leptospermum obovatum
Pomaderris eriocephala
Pultenaea procumbens
Solanum linearifolium

Groundstorey

Bulbine bulbosa
Carex appressa
Chrysocephalum apiculatum
Chrysocephalum semipapposum
Craspedia variabilis
Dianella longifolia
Dichopogon fimbriatus
Eryngium ovinum
Glycine clandestina
Hardenbergia violacea

Lomandra longifolia

Lomandra filiformis
Microseris lanceolata
Veronica derwentiana
Veronica perfoliata
Wahlenbergia communis
Xerochrysum viscosum

Grasses

Austrostipa scabra
Austrostipa sp.
Bothriochloa macra
Microlaena stipoides
Poa labillardierei
Poa sieberiana
Rytidosperma pallidum
Rytidosperma spp.
Themeda australis

Environmental outcomes of our community efforts

Improvements to water quality

A major goal of the revegetation works in the Lower Cotter Catchment was the stabilisation of soils and reduction of erosion in this important water supply catchment.

Initially, much of the gain in water quality following the fires was due to regrowth of grasses. However, over time our planting efforts have helped stabilise areas vulnerable to erosion.

ACT Parks and Conservation Service have commissioned the University of Canberra to monitor water quality over time. This monitoring has shown a steady improvement in water quality flowing into the Cotter Dam, something our volunteers can be truly proud of every time they turn on a tap in Canberra or Queanbeyan.

New homes created for our native animals and plants

The Cotter Catchment is an important area for many of the animals and plants that call our region home.

Its location between the tableland plains and the high mountains means the area serves as a vital transition point for many birds migrating annually in spring and autumn, who benefit from the habitat provided by the newly reestablished native forests.

The higher rainfall of the Cotter region and varied topography means the area also provides important refugia for many plant and animal species uncommon in the drier regions of the Limestone Plains.



Resilient landscapes for the future

By reestablishing native vegetation in the majority of the Lower Cotter Catchment, we have built a more resilient landscape. In this fire-prone area, our native vegetation has the ability to bounce back, as the native forests of the Brindabellas have done following the 2003 fires.



*Before (above) and after (below):
Five years' growth after a Greening Australia community planting in the Lower Cotter Catchment*

Community spirit prevails

Huge community efforts

None of the work achieved in this large-scale landscape restoration project would have been possible without the tireless efforts of volunteers from the Canberra region.

Across the last decade, 706 events have been held, the equivalent of more than one group heading out every week.

In total, volunteers have so far donated 47,295 hours of their time. This huge number represents more than 26 years of full-time work. This is equivalent to having employed two and a half people day in-day out since the fires!

14,893 participants were involved in the massive effort, equating to nearly 1 in every 20 Canberrans. This means nearly everyone who has lived through this period of Canberra's history either got their hands dirty helping out, or knows someone who did.



"It has been encouraging to see the success of our planting efforts, the return of a range of wildlife to the area and the knowledge that we are contributing towards improving the environment and the water quality entering our dams."

**Kolin Toivonen,
long-term weekly volunteer**



Types of community events

A range of community event types were offered, to enable volunteers to engage as frequently as their time and energy allowed.

These events included the headline mass planting events held 3-4 times per year on weekends and attended by hundreds of volunteers. These have truly shown the huge community support for the regreening effort, with some of these events attended by up to 500 people.

At the other end of the spectrum, small groups of volunteers have headed out on a weekly basis, attracting less attention than the gala public days, but quietly achieving a huge amount through targeted planting, maintenance and weed removal works.

As well as these small and large group events, a great deal of planting was conducted during monthly outings by regular volunteers as well as interest groups wanting to lend a hand.

Volunteers from all walks of life

One of the features of our volunteer-based restoration efforts has been the breadth of the community that has been involved.

It is a true credit to the Canberra community that people from all walks of life have been willing to donate their time to repairing our landscapes. Groups have included:

- School students
- Defence personnel
- Toddlers to oldies (including an 80th birthday celebration)
- Corporate and business groups
- Religious denominations
- Charity groups
- Singles events
- Correctional centre groups
- University students
- Scouts
- Rotarians
- Embassy staff
- Peak body groups
- Motorsport clubs

Keeping the community coming back for more

The biggest reward for participants has been a meaningful sense of achievement and knowing the seedlings they plant will contribute to the future health of this wonderful area. We have also worked hard to provide interesting and entertaining experiences to keep our volunteers engaged.

Some examples of the variety of activities and special features at events have included:

- free BBQs and refreshments
- barista-made coffee
- musical performances from local folk and classical artists
- talks from experts across a range of relevant topics
- selection of appropriate sites for different groups

Specialist volunteers

The long-term program of events in the Lower Cotter has enabled us to 'skill up' some of our regular volunteers, which has both aided the efficiency of our work and provided a rewarding experience for these volunteers.

David and Meredith Hatherly are two volunteers who make a formidable team, able to plant 120 seedlings in a morning and still have time to remove a few stray pine wildings.

Other volunteers have specialised in seed collection, under guidance from the seedbank manager, learning the timing of seed set and the best ways of collecting seed from different species.

Further specialisations by volunteers have included weed removal and monitoring.



Corporate volunteer group - KPMG

KPMG has been one of the long-standing corporate groups who have volunteered in the Lower Cotter Catchment.

"You and your team did an excellent job, making the day so enjoyable for our staff and their guests. We look forward to receiving updates on your progress and being able to help Greening Australia in future events."

Case Study: National Tree Day 2007



The National Tree Day planting site from 2007 is an example of the extraordinary work the community can do when we band together.

An entire hillside, devoid of vegetation, was transformed in a single morning by 500 volunteers and 5000 native seedlings.

The before and after photos on the right show the progress at one of our monitoring sites over a three year period, and this site just continues to grow better and better!



Community ownership and education

Benefits of community engagement

The rebirth of the native forest in the Lower Cotter Catchment was only achieved with the tireless efforts of volunteers from the Canberra community.

These thousands of Canberrans, young and old, got dirt under their fingernails. In the process we as a community are now more connected to this country and more knowledgeable about the water catchment areas. This engagement has created a sense of ownership of the Lower Cotter, within a diverse cross-section of our community, which will serve the region well into the future.

Significant partnerships

The valuable work of volunteers in the restoration works was recognised by a number of partner organisations, including significant partnerships with 666 ABC Canberra and as part of the Centenary of Canberra celebrations.

In collaboration with 666 ABC Canberra, the second highest rating radio station in Canberra, we staged a number of events. These were widely promoted before and after, as well as live broadcasts being held from the planting events themselves.

We staged four large events as part of Canberra's centenary celebrations, celebrating the strength of the community during its darkest days.



The Cotter in the media

Excellent media coverage of the community's hard work in the Cotter, through 72 radio, television, newspaper and magazine articles, has served to spread far and wide the message of the value of our water catchment areas. This coverage also reinforced the huge impact that volunteers, supported by the ACT Government and Greening Australia, have made to repair these burnt landscapes.



Celebrating the Cotter's renaissance

Fire damaged Cotter replanting takes years to fix

By Peter Jean

The rain held off almost long enough yesterday for 3700 trees and shrubs to be planted at the

200 volunteers from Greening Australia and other groups took part in the mass planting on Laurel Road. This was part of the revegetation of the Lower Cotter water catchment after the 2003 bushfires.



Planting Youngsters dig for a greener future

Sowing seeds of hope after the fires

Does revegetation by the community work?

Monitoring the hard work

To ensure all the hard work undertaken by volunteers is achieving the desired ecological results, Greening Australia staff and volunteers have implemented a monitoring and research program across the area.

The major component of this work has been an ongoing monitoring program of community planting sites. This study has looked at the survival rates of plantings across eight separate planting seasons, and tracked individual seedlings through time.

108 monitoring sites have been established across the catchment, tracking the progress of 2160 individual seedlings.

The average survival of seedlings one year after planting is nearly 80 percent, which is an excellent result considering volunteers included many first-time planters and school groups. Also of note is that plantings from 2006 had a much higher mortality rate, due to a very dry year; average survival across all other years stands at 83%.

Community planting survival rates by year of planting

Year	Percentage survival
2005	82
2006	53
2007	88
2008	95
2009	73
2010	80
2011	81
2012	79

Other science conducted

As well as the community planting monitoring there have been several other components of our scientific program in the Cotter.

Greening Australia sponsored a student at the Australian National University, Darren Brown, who looked at the natural regeneration processes, and whose work shaped the species mixes used in subsequent revegetation works.

Another part of our science program was a trial of seedballs, of potential use in difficult conditions where slope, debris and climatic conditions make other revegetation techniques difficult. This trial showed the potential of seedballs for some shrub and grass species.

A monitoring program for groundstorey species was also established, as these small plants are often more difficult and expensive to establish than trees and shrubs. This ongoing trial has highlighted some of the species more likely to persist, such as Bulbine Lilies and Billy Buttons.



Monitoring volunteer:
Sarah Hnatiuk

Sarah is one of the stars of our volunteer team and an absolute stalwart of our monitoring program.

The future...

There are still small pockets of the Lower Cotter area which will require further work into the future. The ACT Parks and Conservation Service continues to work with Greening Australia to identify problem areas and undertake planting and weed control where required.



However, thanks to the hard work of thousands of volunteers, and the support they have received along the way from the ACT Government, the vast denuded areas of former pine plantation have now been replanted.

Hundreds of hectares of the Lower Cotter Catchment are now growing into resilient native ecosystems. These new forests will continue to improve the quality of water flowing into our reservoirs for the years to come.

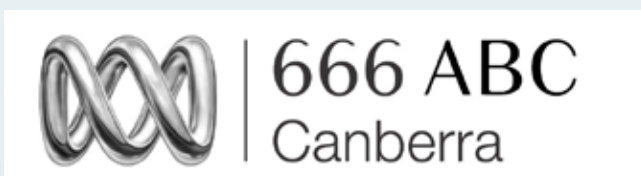
This is a remarkable achievement, showing the strength of our community when enthused, engaged and supported.

The transformation of the Cotter is an achievement of which the Canberra community can be incredibly proud.

Supporters

The stunning transformation we have achieved with the Canberra Community in the Lower Cotter Catchment has only been possible with the investment in our community by the ACT Government. The forward thinking following the fires, and willingness to truly harness the community support, enabled this huge undertaking to occur.

We have also been supported in this massive effort by a number of other organisations and businesses. We thank everyone who has contributed, through donating time, money or expertise to regreening this important area. Through this generosity, we have managed to transform the charred remnants of pine forests into flourishing native forests.



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