

Strategic and coordinated nature conservation and revegetation in and around Queanbeyan: what, why, where, who and how?

Prepared by Queanbeyan Landcare, August 2023, focusing on Queanbeyan City and adjacent lands, in the context of the wider landscape, not the wider QPRC LGA.

1. Summary

To maximise nature conservation outcomes, this paper argues for a more strategic and collaborative approach to nature conservation across Queanbeyan and adjacent areas, bolstering the current situation of positive but too often uncoordinated efforts by multiple groups. The aim is to enable shared information, lessons and resources, and greater clarity for organisations and volunteers as to the purposes and priorities of revegetation and landscape rehabilitation efforts. In the absence of a full vegetation and biodiversity survey, it is suggested that, in the near term, sharing and updating existing knowledge could inform discussion and identification of priorities between interested groups.

2. Background

There has been a marked increase in native revegetation efforts in and around Queanbeyan in recent years, flowing from the re-invigorated activities of Queanbeyan Landcare Inc (QLC), QPRC planting programs, initiatives on private lands near the city, and most lately via promotion of a 'micro-forests' within the city. (The trend in and extent of native vegetation management on most private lands within and adjacent to the city is not well known.) Set against this encouraging trend, there has been ongoing loss, fragmentation and degradation of native vegetation and wildlife habitat due to housing and transport developments, weed infestation and user impacts. Major housing and transport developments have occurred since the latest (2008) biodiversity survey.

Current projects include: (i) QLC/QPRC plantings and maintenance along the Queanbeyan River near the old cemetery, the outdoor classroom near Glebe Park, Mt Jerrabomberra-Stringybark Ridge, Bicentennial Park, maintenance of Buttles Creek, ongoing plantings at Fernleigh Estate, and the National Tree Day 2023 600m² planting at Barracks Creek; (ii) QPRC tree plantings for urban cooling, in various locations across the city; (iii) developer and public agencies' revegetation adjacent to housing, transport, etc development; (iv) private land initiatives outside the city, from small projects to the larger Wandiyali Restoration Trust initiative, and (v) the proposed 'micro-forest' at Blackall Park.

(Details of many of the >35 current and past projects by QLC, its predecessor groups and partners are described under Projects at <https://www.queanbeyanlandcare.org.au/>, many of which have sought to create corridors and connectivity at a larger scale.)

It is not apparent that these various activities equal a coordinated approach to the creation, protection or maintenance of native vegetation and associated wildlife habitat and

recreational/scenic amenity. Without being critical at all, many projects are located opportunistically, where a site and resources happen to be available. It is well established that a landscape-scale approach to nature conservation is optimal, to identify priority areas, use resources efficiently and to create and maintain connectivity for wildlife movement and survival. This is known as *connectivity conservation*, or 'managing the matrix', and involves connected patches, 'stepping stones' to connect areas, and corridors of vegetation.

While individual projects have merits and should be encouraged, the current, apparently *ad hoc* approach will not achieve the more-than-the-sum-of-parts outcomes that are possible. The potential gains include better conservation outcomes, efficiency in deploying resources (finance, equipment, labour), information and lesson sharing, improved public education and engagement, clarity around aims, and provision of recreational and scenic amenity.

If a more strategic, landscape-scale approach was to be pursued, the following identifies factors to be considered in understanding what is involved, and in deciding why revegetation and vegetation management projects would be considered, where they should be placed, who might be involved, and how that can happen.

3. What is involved?

Planting is only part of it. A revegetation project typically involves (i) research and planning to decide where to undertake the project and what the aim and activities are, ideally within a strategic collaborative framework; (ii) arranging the necessary resources and approvals; (iii) undertaking works including site preparation and planting; (iv) acquitting any grant reporting or other obligations, and (v) ongoing maintenance of the site (weeding, stakes and tree guard removal, rubbish removal, supplementary planting).

Experience across many projects suggests that (v) above is often the most problematic over the long term, within the stretched resources of both volunteer groups and public agencies. The 'Friends of' model has proven very successful in some places, for example at Bicentennial Park, but in other cases ongoing maintenance has been difficult to maintain. Different sites and planting designs can result in greater or lesser maintenance needs.

4. Why do it?

Individual revegetation and restoration projects will have different aims, sometimes singular but often aiming to fulfil more than one purpose. Being clear about the purpose serves to better define the most suitable areas for attention, the planting regimes, engaging participants, and designing maintenance. Conversely, being clear about what a project *will not* achieve is also important. The various purposes of revegetation and rehabilitation are:

1. Biodiversity conservation: the reintroduction of plants species and vegetation associations for their own conservation value, and as habitat for wildlife (mammals, marsupials, birds, reptiles, invertebrates, aquatic species). This involves clarity about

what vegetation association and species were/are native to the area, whether they can be reintroduced or whether analogous species are used, and what wildlife species are being targeted and what their habitat requirements are. Some projects target specific animal or plant species (eg, *Aprasia*, *Rutidosia*), although often with wider conservation benefits. Other projects are broader in their focus, aiming to recreate natural areas and habitat for multiple species. Revegetation is often the principal focus, but biodiversity conservation also entails habitat enhancement (nest boxes, logs, rocks, refuge tiles), weed removal, feral animal control and population monitoring.

2. Erosion control: the use of vegetation to stabilise the land surface and prevent soil erosion, and of constructed/protected wetlands to control downstream sediment movement and improve water quality, all with potential biodiversity benefits.
3. Exotic species control/elimination: out-competing or discouraging weeds by re-establishing native vegetation, and weeding/spraying in revegetated areas. (Feral animal control is not discussed here but is a live issue in the district including cats, foxes, deer, pigs. European wasps and a number of exotic bird species.)
4. Carbon sequestration: capturing carbon in vegetation and soil as a measure to reduce greenhouse gas concentrations in the atmosphere. In urban projects, this is an admirable goal but the amounts of carbon sequestered in urban projects is, in the context of overall emissions, very marginal compared to larger opportunities in non-urban areas, and difficult to measure.
5. Urban heat management: (urban cooling), being the use of vegetation to ameliorate increased temperatures already occurring and being exacerbated by climate change. Moderating heatwaves is a key goal, with heatwaves causing more human fatalities than any other natural hazard in Australia. Most often thought of in terms of trees providing shades, urban heat management also involves other vegetation (shrubs, grasses), built shade structures, building design and operation, and minimisation of impervious surfaces. Priority areas are those where tree cover and other vegetation are lacking, and where significant areas are exposed, hard surfaces.
6. Recreational and scenic amenity: to provide, improve or allow for outdoor recreational access (walking, nature observation, gatherings, etc), and/or to provide visual screening, noise abatement and/or pleasant views.

5. Where to revegetate or manage?

It is important to consider the context of individual plantings. Broadly, we can identify different parts of the landscapes within which revegetation and rehabilitation might occur, in terms of land use, original vegetation, present vegetation, landscape condition, human-built or altered landscapes, and human uses, influencing what is possible and what natural habitats are being enhanced or the values of which are trying to be replicated.

1. Urban environments with little or no native vegetation excepting small patches in backyards or in public parks and unused areas. Of limited conservation value but some potential for provision of for example bird habitat or public education. More potential where sites are may be valuable as 'stepping stones' between larger vegetated areas.

(Note: it is apparent that many households lack easy access to guidance should they wish to utilise locally-suited native plants in their properties. This is a need that could be easily addressed using existing knowledge.)

2. Urban reserves or other public lands within the city containing significant native vegetation or the potential for native plantings: some offering connectivity to ex-urban areas, others more isolated. Of varied conservation value or potential depending on other use demands, proximity to other areas of native vegetation, and logistics of planting and maintenance. A prime local example is Bicentennial Park, which combines native vegetation connected to other areas, and a valued recreational resource. Another example is Barracks Creek where existing creek side vegetation was enhanced by a QPRC planting several years ago, and further planted in July 2023.
3. The Queanbeyan River corridor and links to the Molonglo River corridor and remnant vegetation and riparian patches along major creeks (eg. Buttles and Barracks Creeks in the city, Jerrabomberra Creek reaching further into surrounding lands). Where space and existing use permits, these offer significant conservation value though existing or potential native vegetation, for habitat, wildlife movement corridors, water quality and aquatic biodiversity.
4. More extensive areas of natural or reasonably intact vegetation managed at least in part for conservation on public lands close to the city, including the Queanbeyan Grasslands, Mt Jerrabomberra and Cuumbeun Nature Reserve.
5. Larger open space public areas dedicated to other uses (eg. sporting) near the city, and on privately owned lands: conservation value varies from very low to significant.

The tenure/ownership and other uses of project locations, whether existing or possible future ones, is key to determining what is appropriate or possible to be encouraged or undertaken and for who might undertake vegetation management.

Across these, there is the question of original vegetation and thus what is being sought to recreate or approximate. This is complicated by sparse records of pre-European occupation land condition, and of the long-term stewardship of vegetation, land and water by Ngunnawal and Ngambri peoples through fire and other practices, which would not have been uniform across the whole landscape but rather a complex of management practices for different purposes across of the landscape. Many areas have been significantly altered by the cessation of First Nations fire management and introduction of grazing, logging and other uses.

In summary, much of the lower elevation areas in the region was originally Box – Gum Grassy Woodlands, Native Temperate Grasslands (both Endangered Ecological Communities), and mixtures of these, merging to *Eucalyptus*-dominated Dry Schlerophyll Forest on higher ridges and ranges, with areas of shrublands (such as *Kunzea*-dominated slopes) and riparian vegetation corridors and associated small wetlands. The 2008 biodiversity study mapped vegetation in detail for the older, smaller QCC area. Many grassland areas are dominated by introduced pasture species. Across all these, species and vegetation alliances vary with soil type, slope and aspect. In many semi-natural areas, there may be diminished tree cover, or regrown and thicker tree cover, varying extents of weed infestation, and lasting impacts of past land use. In terms of wildlife habitat, key issues are a lack of larger, older hollow-bearing trees,

lack of refuge or cover for smaller animals and birds, scarcity of food-bearing (eg. flowering, fruiting, seeds) plant species, simplified and otherwise degraded grass, forb and shrub layers, and fragmentation and isolation between patches of native vegetation. Revegetation and rehabilitation projects may aim to connect areas, recreate presumed original vegetation, or to create 'novel ecosystems' using a variety of native plants and other measures to enhance wildlife habitat and/or achieve other aims.

Existing and potential projects exist within a variety of scales: (i) within the city, including both small private property scales (ie. backyards) and smaller and larger public lands); (ii) the city-wide scale; (iii) the city-to-surrounding natural and semi-natural areas scale; and (iv) connections with larger natural areas in the wider landscape, including large scale initiatives such as the Great Eastern Ranges project (eg. <https://ger.org.au/>). Coordination across these scales is important. Encouragement of native planting in backyards may complement small scale revegetation on within-city public lands (parks, roadsides), especially toward the edge of the city where they connect to larger natural areas. An example is QLC's West Queanbeyan set of projects linked to Mount Jerrabomberra, and on to wider connectivity via Gale Precinct to the Queanbeyan River corridor, Googong Foreshores, Cuumbeun Nature Reserve and beyond (<https://www.queanbeyanlandcare.org.au/west-queanbeyan-story>).

Existing information: A number of vegetation and ecological studies and mapping exercises exist already that indicate areas of conservation value and connectivity, however these are dated and/or partial. Earlier examples are the detailed 1993 Barrer report and 1997 NPWS/Craven report. More recently, the 2008 Biodiversity Study Findings Report of the Queanbeyan LGA (not the larger QPRC area), and a 2014 Biodiversity Study South Jerrabomberra (a several others of the Tralee area) map multiple conservation values. The QPRC Regional LEP 2022 maps areas where decisions "must consider" biodiversity, but is at a coarse scale. Broader state and regional scale vegetation and habitat mapping exist and provide a wider connectivity perspective, however are generally of too coarse a resolution to inform local project design. Apart from some excluded areas (some covered by later, specific studies), the 2008 study identifies vegetation types, conservation value, endangered or vulnerable species and communities, and existing or potential 'biolinks' or connectivity areas. Some of the mapped areas have been affected by subsequent development, fire or other impacts, however the data and maps are still very useful. There is also a substantial body of local knowledge and expertise held by long term Landcare and other volunteers.

6. Who does what?

Australia's decades of experience with Landcare and other ecological rehabilitation initiatives have produced a wealth of experience, and many lessons on what different people and organisations can offer. QLC and its predecessor groups and partners have similarly learned many local lessons over the years. Different people have their own skills, capabilities and preferences, ranging from strenuous preparation work, planting and weeding, to public education and social media promotion, to administration and grant-getting. Our various nature

conservation groups all have their particular priorities and interests. QPRC manages large areas of public land and has dedicated staff and other resources.

In the Queanbeyan district, key players needed to be involved in any effort to coordinate and plan for the future include: Queanbeyan Landcare, QPRC, Molonglo Conservation, Upper Murrumbidgee Catchment Network, NSW National Parks Service, and the micro-forest group. Including ACT Landcare and Friends of Grasslands would be valuable to consider cross NSW-ACT border issues. (Noting that many projects involve collaboration with other organisations, volunteers, etc.)

7. How: where to from here?

If the argument for greater levels of clarity and coordination are considered valid, three options are available to take this further:

1. Given partial and dated information, await updated and detailed vegetation and habitat mapping, to identify current natural and semi-natural areas of likely conservation significance and future areas of priority for protection, revegetation and management. QPRC intends to commission an LGA-wide biodiversity study, resources permitting. This would be a significant cost and delay but would provide a much more substantial evidence base. (Such a study could also consider values other than biodiversity, however this would be an even larger and more expensive undertaking.)
2. At a less detailed level, a broad-brush assessment of the city and surrounds, and a joint discussion of priorities and plans. This could consolidate and qualitatively update existing information sources noted above, using local expertise and experience. This would be arguably sufficient to inform a broad set of priorities and identification of opportunities for the future, based on identifying existing and proposed projects against conservation value, endangered species and ecological communities, and biolinks/connectivity. Most simply, consolidation of information, and a series of meetings, facilitated over a few months.
3. Continue with largely uncoordinated projects.

Option (3) would not enhance nature conservation. While strongly supporting a substantial biodiversity study at option (1) above, QLC proposes that, until that becomes possible, option (2) is worth pursuing as a near term strategy.
