

Trail Master Plan West Belconnen Conservation Reserve

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Riverview Projects
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Introduction

1.1 West Belconnen Conservation Reserve

The West Belconnen Conservation Reserve (the Reserve) will encompass both the Murrumbidgee River and Ginninderra Creek corridors where they adjoin the proposed West Belconnen development area. It will have an area of approximately 580-hectares. The Reserve is to be managed by a community based trust and is intended to become a leader in community management, restoration of biodiversity and opportunities for enriching and sustainable recreation. The trust is a not-for profit corporation with the principal purpose of enhancing protection and management of the Reserve. In addition to ecological restoration and management activities, the activities of the trust will include recreation, education and eco-tourism initiatives that help connect members of the community to the natural environment and inspire them to care for it.

The adjoining West Belconnen urban area is being developed with a sustainability ethos that includes encouraging community ownership and respect for ecosystem functions, the intrinsic value of the Murrumbidgee River corridor, ecological restoration of conservation areas and recognition of Aboriginal and non-Aboriginal cultural values.

The Draft Management Plan Discussion Paper (1) for the reserve identifies the intention to manage it as a IUCN Category IV reserve. Reserves in this category have a primary objective to maintain, conserve and restore species and habitats. Other objectives may include the provision of a means by which urban residents may obtain regular contact with nature.

In this context, the Reserve will contribute to the conservation of a number of ecological communities. It will also contribute to the National Capital Open Space System (NCOSS) and provide an important connection to nature for the adjoining and wider community. It contains areas of high heritage and conservation value that must be acknowledged and protected but it also presents the opportunity for appropriate recreation activities.

The West Belconnen Landscape and Open Space Strategy (LOSS) (2) identifies opportunities for walking, cycling and vehicular access within the Reserve and connecting to the adjoining areas. It also identifies opportunities for equestrian trails near the edge of the reserve and connecting through the West Belconnen development area. (2)

While focusing on the primary objective of conservation, the Draft Management Plan Discussion Paper also proposes visitor facilities and a system of recreational trails that connect to the wider regional trail network.

1.2 Reserve Management Plan

The draft Management Plan (3) for the West Belconnen Conservation Reserve sets out the Vision and Values for the Reserve and provides important context for the development of a Trail Master Plan.

The vision includes a desire to achieve a sense of tranquillity, a showcasing of Ginninderra Falls and opportunities for the community to understand, enjoy and contribute to the reserve.

Importantly the Reserve sets out to protect and restore areas of significant biodiversity which includes nationally significant habitat (Pink tailed worm lizard, woodlands and derived native grassland and golden sun moth), an area of high biodiversity (Ginninderra Gorge) and stands of River She-Oak along the Murrumbidgee River.

The management plan also recognises that the Reserve's scenic values, river frontage and the presence of the Ginninderra Falls will make it a significant recreation resource for the residents of West Belconnen and the region.

The recognition in the Management Plan for the need for an adaptive management approach will be particularly important in relation to the provision of trails. While this Trail Master Plan seeks to provide for a network of trails that will meet the anticipated demand, and it provides possible alignments for additional trails should additional demand become apparent, a degree of adaptability will be required to balance the primary ecological objectives with the provision of sustainable trails.

1.3 Objective of the Trail Master Plan

The objectives of this Trail Master Plan are to:

- Provide the blueprint for walking and mountain bike experience that caters for a range of users within the reserve.
- Confirm the alignment of the Bicentennial National Trail along the top edge of the corridor.
- Protect the values of the reserve and ensure the ongoing conservation of the endangered species and ecological communities.
- Protect indigenous heritage values within the reserve.
- Propose a network of trails that link the Conservation Reserve with other important natural features and adjacent population centres.
- Increase the health and wellbeing of local residents.
- Attract people to the area to provide economic benefits.
- Be available to support applications to construct the necessary infrastructure.
- Integrate the track and trail system with bushfire management requirements.

In addition to the opportunities presented by the spectacular scenery, the Master Plan takes into account the topography from a trail amenity point of view, the presence of existing trails, service access and bushfire management. It also takes into consideration Water Sensitive Urban Design infrastructure to be installed as part of the project.

1.4 Health and Recreation

Incorporating the principles of active living into a community leads to a healthier, more active population with benefits to society that include fewer sick days and reduced risk of chronic disease (4). Community assets that facilitate active living and encourage physical activity therefore warrant investigation and investment.

The construction of trails in and around Canberra, as well as elsewhere in Australia has led to large numbers of people being physically active and enjoying the outdoors. The benefits that Canberra and other regions are enjoying include (5):

- Reducing barriers to participation in physical activity, assisting communities in improving their physical and mental health, with an associated reduction in obesity, diabetes, hypertension, depression, anxiety and other related health issues (4).
- Cooperation between a diverse range of community members and organisations such as Local Government Authorities, not for profit groups, sporting clubs and local business (6).
- Easy access to free sporting and recreational opportunities, promoting physical activity and well being for families, individuals and people of all ages.
- Increasing community participation with successful trails generating a sense of community pride and encouraging involvement in and ownership of local trails.
- Provision of educational and interpretative opportunities and increased environmental awareness and appreciation.
- Development and extension of tourism ventures that play to the region's advantages and attract increased tourism visitation and spending.

- Facilitating employment and business opportunities.
- Encouraging people to try new recreational activities promoting healthier, more active communities.
- Preserving and promoting biodiversity, local history and cultural values through documentation and interpretive opportunities.

1.5 Stage 1 Proposal

While this trail master plan sets out to identify the appropriate nature of trails to be provided throughout the Reserve, it will be subject to the same adaptive management approach as the rest of the Reserve.

Initially, a limited number of trails are recommended for the first stage of the Reserve. These trails will provide:

- Connections between the first urban development stages and the river park.
- A way to walk or ride to the river without using trafficable roads. Encouraging people to leave their cars at home.
- A connection to Shepherds Lookout to the south.
- A relatively direct route for walkers using a stairway.
- A more circuitous route for bikes that maintains a manageable gradient.
- An observation point with commanding views along the river.
- A walking only trail in the northern woodlands area to ensure there is some tranquil space.
- A trail relatively close to the urban edge that will help to catch and redirect people who start to tramp cross-country from the urban edge.

The recommended Stage 1 Trails are illustrated in Figure 1 below.

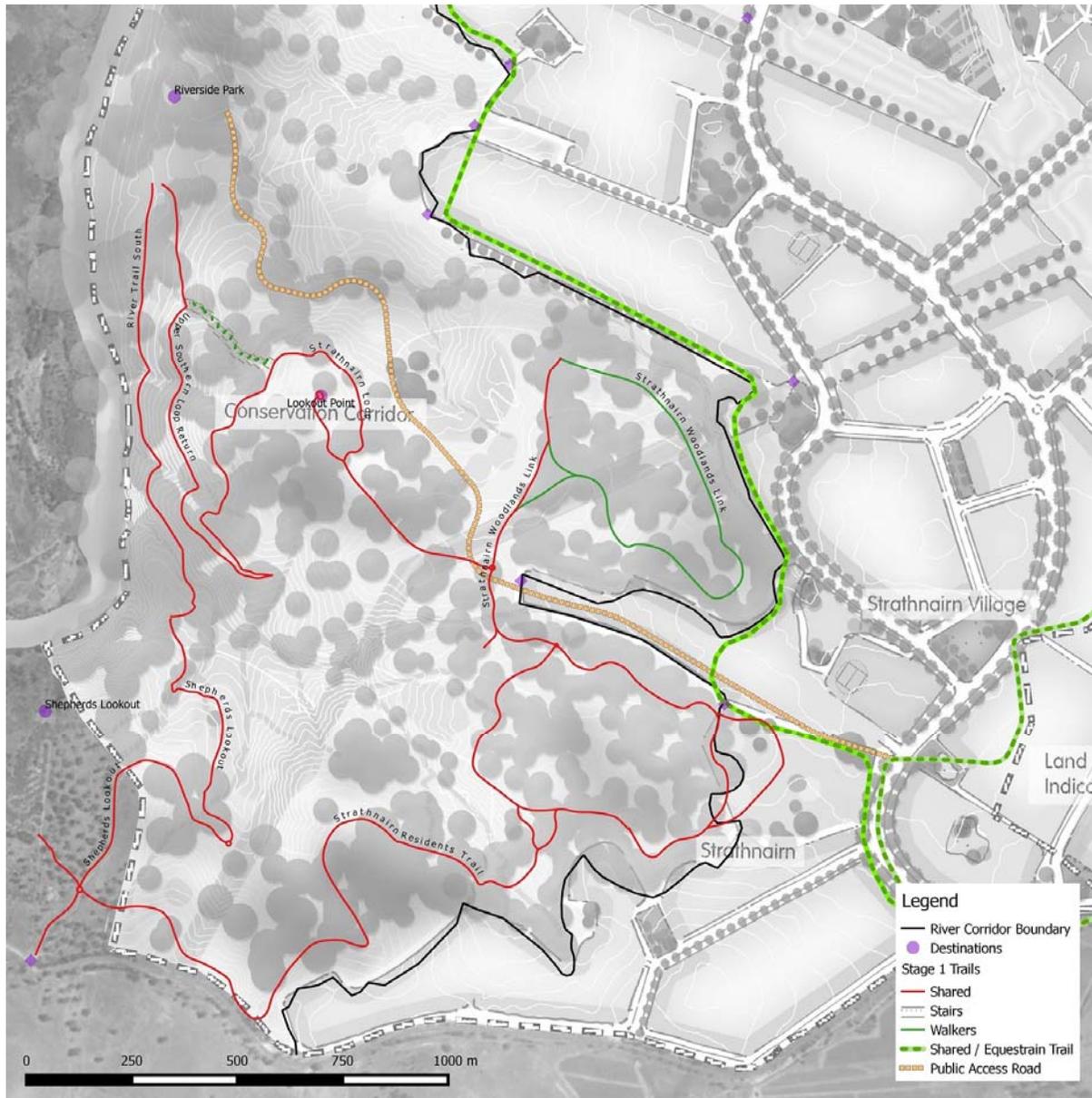


Figure 1 - Stage 1 Trail Plan

1.6 Longer Term Possibilities

Figure 2 illustrates the how the trail master plan may be laid over the master plan for the West Belconnen development area in the longer term future.

At this scale the details of the plan are lost and it is not possible to present all of the underlying information that has informed the development of the plan. A large scale (A2) plot is available as an attachment to this report and the relevant data is available as GIS files upon request.

At this scale, the following broad principles are apparent. The proposed master plan seeks to provide:

- A main multiuse trail outside but close to the upper boundary of the reserve. This trail will perform the shared role of edge road, fire break, equestrian trail and walking and cycling trail. Due to its shared nature the level of amenity for walking and cycling will be compromised. The alignment of this trail will need to be finalised in conjunction with the design of the adjoining urban area.
- A shared (walking and cycling) trail that follows the contours near the upper boundary of the reserve offering a convenient, high amenity opportunity to visit the reserve area.
- A trail that follows the river edge allowing people to travel along the river, linking various points of attraction and connecting to the wider path network.
- A series of linking trails providing connections between the upper and lower parts of the reserve connecting likely origins and destinations.

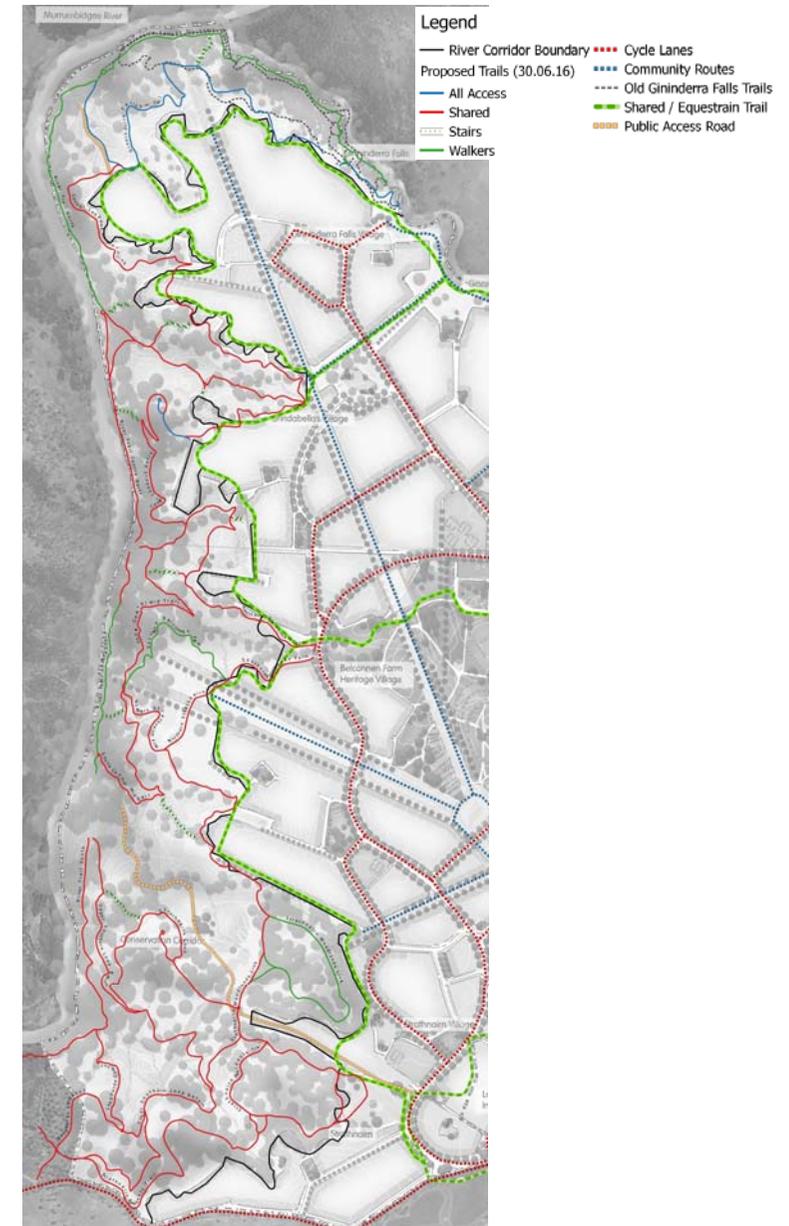


Figure 2 - Trail Master Plan

2

Analysis

2.1 Demand analysis

The West Belconnen project site covers a total area of 1623 ha and will ultimately be home to a community of 30,000 people (2). Recreation needs of the community will be met in a range of ways, however the open space system and its integration with the other uses will be of primary importance.

The study area has an abundance of unencumbered views to the north and west. There is significant opportunity to celebrate these views throughout the open space system using both significant vantage points and through the design of the trail network itself. This has the potential to make West Belconnen a destination for the wider Canberra community and the tourism community beyond.

With a combination of proximity and spectacular natural beauty it is anticipated that there will be strong demand for both walking and multi-use trails within the reserve. This demand is based upon the knowledge of utilisation seen in other reserves and trails in proximity to Canberra's urban areas.

In 2011 a Community Satisfaction Survey commissioned by Parks and City Services estimated that in 2011-12 there were 3,409,328 visits Canberra Nature parks and Reserves. The vast majority of these visitors used the reserves either on foot or on bicycle.

An assessment of usage of sections of the Centenary Trail has revealed that:

- New sections of trail are, unsurprisingly, highly utilised just after opening with a peak of usage within the first three months. Post opening there was a decline in usage with the average usage plateauing to approximately one third of peak usage.
- There is continued usage of trail infrastructure with usage rates along the Murrumbidgee and Mulligans Flat averaging 44 and 41 users per day. Of note neither of these locations are close to existing housing or work places. The Mount Ainslie trail by contrast, has an average of 679 users daily. Peak usage for trails is on weekends.

Figures indicate that trail facilities will be used regularly, particularly on weekends. While there are many factors that influence the utilisation rates of trails, particularly the ease of access, the proximity to population and the level of amenity offered, it would be reasonable to expect that some trails in the river corridor will attract in the order of 50 users per day. At iconic locations such as Ginninderra Falls this number could be considerably higher.

2.2 Walking Trails

The Australian Bureau of Statistics reported that walking is the most popular physical activity within Canberra with 27% of people walking regularly, (with another 3% identifying bushwalking) (7). Overall, the most popular facilities used for participating in sport and physical recreational activities were parks, beaches and walking trails, with 58% of participants using these facilities (7). Based on these statistics it is evident that the future residents of West Belconnen will be looking for recreational walking opportunities and the amenity of the river corridor will be a natural attractor.

Walking is a very popular activity within Canberra. There are significant numbers of visitors to Canberra Nature Park with the most popular trails being narrow single (1200mm) destination trails in locations such as Mount Ainslie and Mount Painter. The construction of the Canberra Centenary Trail has also seen increased visitation to trails such as the Pine Island to Kambah Pool section of the Murrumbidgee walking trail. Trail runners and hikers also prefer these trails. Recreational and fitness runners are generally happy running on smooth maintenance trails, community paths as well as narrower single trails.

The preferred trail types for the target audience is single trail and maintenance trails varying in width between 1200 mm to 1500 mm (single trail) and 4 metre wide maintenance tracks. Users will be interested in a range of distances from 1 kilometre to in excess of 30 kilometres. Multi-use shared trails are generally appropriate for these users.

Some walkers will be seeking a quieter, more remote experience and would prefer trails that are for walking only rather than shared with people on bicycles. To cater for this, some trails are identified as walking only. This is also appropriate in places where the terrain is particularly steep, rocky or sandy where it would be more difficult to provide shared use trails.

2.3 Bicycle Trails

Mountain biking is a segment of cycling that is focused primarily on off pavement travel. (8) Off road cycling has been popular in Australia since the inception of the bicycle in the 1890's. (9) Since the late 1970's, mountain biking has developed into one of the world's most popular adventure sports.

Mountain biking can be classified into a number of broad styles, each with their own infrastructure requirements, and with significant cross over between different styles (10). Recreational riding is often a combination of various styles, including but not limited to cross country, downhill, all-mountain riding and dirt jumping.

Cross-country is the most popular style of mountain biking (11) with other styles appealing to niche markets. Single track cycling is the most sought after experience as it provides riders with a closer connection to nature, segregation from motorized vehicles and a more challenging or varied experience than double track or roads can provide. (8)

Mountain bikers are known for their enthusiasm. Mountain bikers tend to participate frequently, have a preference for the sport in comparison to others activities, and become more dedicated with additional years of involvement. (8) In addition mountain bikers have a willingness to travel to access new experiences.

In order to remain consistent with the primary objectives of the Reserve, it would be appropriate to limit mountain biking to the relatively low impact cross-country style riders, similar to those who use the Canberra Centenary Trail. Downhill riding and high intensity racing would not be appropriate. Large-scale events, that pass through an area, similar in nature to the Centenary Trail Blaze or Canberra 100 may be appropriate in some areas and could be considered by the reserve management on a case-by-case basis.

The preferred trail types for the target audience is single trail and maintenance trails varying in width between 1200 mm to 1500 mm (single trail) and 4 metre wide maintenance track. Users will be interested in a range of lengths and difficulties with a preference for stacked loops providing for distances in excess of 30km. Multi-use shared trails are appropriate for these users.

Trails within this reserve will largely be destination based trails that include the ability to loop providing a different experience/location on the way out and the way back to their starting point.

Dedicated mountain bike only trails are not considered appropriate for the Reserve.

2.4 Equestrian Trails

The needs of the equestrian community will be catered for outside of the river corridor with an additional unsealed shared equestrian trail located adjacent to the urban boundary and some use of the linear urban parks provided by the transmission lines. It is proposed that an equestrian loop route be incorporated along the top of the conservation corridor and Ginninderra Creek riparian zone within the inner asset protection zone. The path would continue north from Belconnen Farm and rejoin the BNT where it exits the transmission corridor near Ginninderra Creek. This 10.8km trail will be a shared trail with cyclists and pedestrians. (2)

Towards the western end of this loop (close to Ginninderra Gorge) the topography becomes increasingly challenging. It may be more appropriate for equestrians to travel through the urban area along the power line corridor in this location.

Further details of the equestrian trails will be investigated subject to further consultation and detailed design investigations.

2.5 Management Trails

In addition to the need for recreational trails in the Reserve, a number of management trails will be needed. In many cases these can follow the same alignment as the recreational trails or the existing farm tracks minimising the disturbance. Management trails will be needed to facilitate land management within the reserve including maintaining picnic areas, weed control and fencing, stock management and numerous other activities. Management trails will also be needed to facilitate bushfire risk mitigation and control.

While the detailed Bushfire Management Plan is still under consideration some broad principles have been considered to cater for the likely needs. These are:

- The avoidance of dead end trails.
- Considering all trails has having some value from a bushfire management perspective – even walking trails that can help to manage a mosaic of controlled burning.
- Provision of a hierarchy of trails that provide a minimum level of access required to manage the land, with key trails complying with ESA standards.
- Using existing trails wherever possible.
- Only closing existing trails after consideration of their value to the fire management effort.

The trails master plan provided with this report illustrates a potential network of vehicular access trails. With the exception of the two public access points, all of these trails would be gated and only accessible by the land managers.

There are approximately 25 kilometres of farm tracks and trails within the corridor at the current time. The network of management trails illustrated would require approximately half of these trails to be maintained with the other half being considered for closure.

Once the Bushfire Management Plan is prepared a reassessment of the possible management trails will be required. This may also lead to changes to the recreational trail network where functionality can be shared.

2.6 Ecological Values

The LOSS (2) and associated documents identify a range of flora and fauna present within the Reserve. The ongoing protection, restoration and regeneration of these species and communities is the primary objective of the Reserve and will be a major measure of the success of the West Belconnen development. A key element of the conservation programs will be the development of management plans for the individual species and communities to ensure their long term survival.

For example, Action Plan No. 29 Ribbons of Life: ACT Aquatic Species and Riparian Zone Conservation Strategy (2007) sets out a number of aims to protect and manage the species including;

- ensuring urban development and associated recreational pressures do not adversely impact the species.
- encourage management to be undertaken in an adaptive framework incorporating research results into management plans
- manage sites to maintain optimum habitat for the species

There are four significant natural features of conservation found within the site

1. Pink-tailed Worm Lizard (*Aprasia parapulchella*)
2. Box-Gum Woodland
3. River Oak Forest
4. Black Cypress Pine

The pink-tailed worm lizard inhabits rocky outcrops located mainly across the north and east facing slopes of the ridges and valleys that border the Murrumbidgee River. It is listed as a vulnerable species under both Australian and ACT legislation.

Yellow Box- Red Gum Grassy Woodland, is listed as an endangered ecological community under both Australian and ACT legislation. This woodland is subject to a National Recovery Plan that identifies a range of actions to be undertaken to ensure its long-term viability. There is 71ha of Yellow Box- Red Gum Grassy Woodland within the site. (2)

The LOSS identifies that a healthy, mature forest of River Oak (*Casuarina cunninghamiana*) occurs almost continually along the banks of the Murrumbidgee River and along a small section of Ginninderra Creek.

The LOSS also identifies that Black Cypress Pine occurs in a number of areas within the River Corridor primarily along Ginninderra Gorge and in an isolated patch to the south of the corridor near the site boundary.

Some trails will pass within or close to potential habitat for some endangered species. The suggested trail alignments have undertaken to minimise disturbance while ensuring that the trail alignment:

- Reduces erosion and ongoing environmental impacts;
- Reduces maintenance costs and associated impacts; and
- Ensures that trail user amenity is high.

Recreational trails can be used as tools to enhance conservation (11) and all trails planned for the area will need to ensure that no detrimental impacts occur to the ecological communities present in the corridor. This will be achieved by avoiding the communities where practical, modifying the alignment of proposed trails during construction to avoid particular habitat features, or modifying trail construction techniques to minimise the impact in some locations.

The Strategic Assessment Report (12), prepared to enable assessment against the requirements of the EPBC Act, has established the following principles in relation to infrastructure within the Reserve:

- Recognise the importance of enhancing connectivity between MNES habitat areas.
- Ensure that there is no net reduction in total MNES habitat areas.
- The design of all infrastructure will be informed by advice from relevant scientific experts, particularly with regard to protecting and avoiding impacts to MNES and their habitat areas.
- Roads and tracks will follow existing alignments where feasible.
- Unused existing tracks will be rehabilitated to enhance connectivity between habitat areas where they fragment existing habitat areas.
- Sealed roads will have a maximum carriageway width of 7.2m plus verge clearances to meet standard safety requirements. Roads will incorporate raised gratings or similar design techniques to enhance connectivity between habitat areas that will be bisected or separated by a road. Road verges and batters that adjoin MNES habitat will be rehabilitated to provide MNES habitat. Gabion walls may be used in place of batters in MNES habitat areas where, due to steep topography, batter rehabilitation is impractical or batter width exceeds 3m.
- Unsealed vehicle track widths will be a maximum of 6m, other tracks and trails a maximum width of 2.5m. Tracks will incorporate raised grating or similar design techniques to enhance connectivity between habitat areas that will be bisected or separated by a track.

- Prior to development of infrastructure in the Reserve, site surveys of threatened flora and fauna species will be conducted and populations of threatened flora and fauna species will be avoided or impacts managed.

These principles are reflected in the proposed trail master plan and implementation recommendations.

2.7 Local Indigenous Heritage

There are a number of sites of indigenous cultural significance within the reserve. The trails master plan seeks to avoid the majority of these sites but this does not preclude the potential for interpretive signage, cultural walks and education programs. Such activities will require co-ordination and approval with and by local indigenous community members.

Within the corridor there is a rock shelter and a number of scarred trees that will require additional management attention. The proposed recreational trails (and indeed the urban edge in some places) will be close to these sites and they are likely to become known by the community. In this situation it will be important to ensure these sites are appropriately valued by the community and their significant is recognised. Specific advice will be required to prepare an appropriate heritage management plan and to provide suitable interpretation and trail access. These sites are not shown on the plans that accompany this report as it is not appropriate to identify their location prior to the conservation plans being in place.

2.8 European Heritage

There are several farms with heritage significance located close to the area including Belconnen Farm (which is listed) and Strathnairn (which is not listed). (2) The trails master plan will seek to incorporate these locations as important touch points of the trail network.

A heritage view corridor from Belconnen Farm has also been identified which the trail network will take advantage of.

2.9 Route identification

There are a total of 20 possible multi-use and single trails identified within the study area with a total length of approximately 43,000m. A breakdown of trail name and length can be found in Table 1. Full descriptions of the trails can be found in Chapters 5 and 6 of this report.

Table 1 - Trail Names and Stages

	Trail Name	Length (m)	Stage
1	Urban Edge Trail		
2	Strathnairn Residents Trail	4500	1
3	Southern Upper Strathnairn	900	5
4	Shepherds Lookout	1800	1
5	Upper Southern Loop return	2700	1/5
6	River Trail South	2800	1/5
7	Strathnairn Loop	1800	1
8	Strathnairn woodlands link	2600	1
9	South Central mid trail	2700	3
10	Northern Strathnairn Link	2100	3
11	River trail Centre South	1200	4
12	Belconnen Farm View Southern	1600	3
13	Belconnen Farm View Northern	2200	3
14	River trail centre North	1500	4
15	Central Lookout Entry	1400	3
16	River Central Lookout Touch Point	400	3
17	Central Lookout Northern Link	5200	3
18	River Trail North	2300	4
19	Ginninderra Falls Rim Trail	3200	2/5
20	Ginninderra Falls to Discovery Centre	2100	2/4
		43000	

2.10 Staged construction

Table 1 (above) and the following 5 images identify possible stages for the construction of trails. The logic associated with each stage is described in association with the adjoining image.

The stages are numbered 1 to 5. Stage 1 should be delivered first but the optimum order for delivery of remaining stages will be dictated by the progress of urban development, monitoring of the demand for the expansion of the trail networks, the acquisition of environmental approvals and the resolution of land access arrangements.

To some extent the stages described here are not a recommended order of delivery but a collection of works packages. Stage 3 is likely to be broken down into sub-stages at the appropriate time.

These stages generally accord with the indicative staging proposed for the Conservation Corridor itself, in particular the Stage 1 trails are contained within the proposed Stage 1 area for the Conservation Reserve.

The staging recognises that as the urban development begins visitation to the river will increase. The provision of trails from the outset will help to control this visitation, establish recreation patterns and minimise the associated environmental impacts.



Stage 1

Provides an initial trail network in the southern portion of the reserve, close to the initial stages of urban development. This initial network of trails will provide recreational opportunities and will help to protect the river corridor from ad-hoc exploration by the new residents.

It will be important for these trails to set the standards and manage expectations for further development of conservation and recreational principles within the reserve.

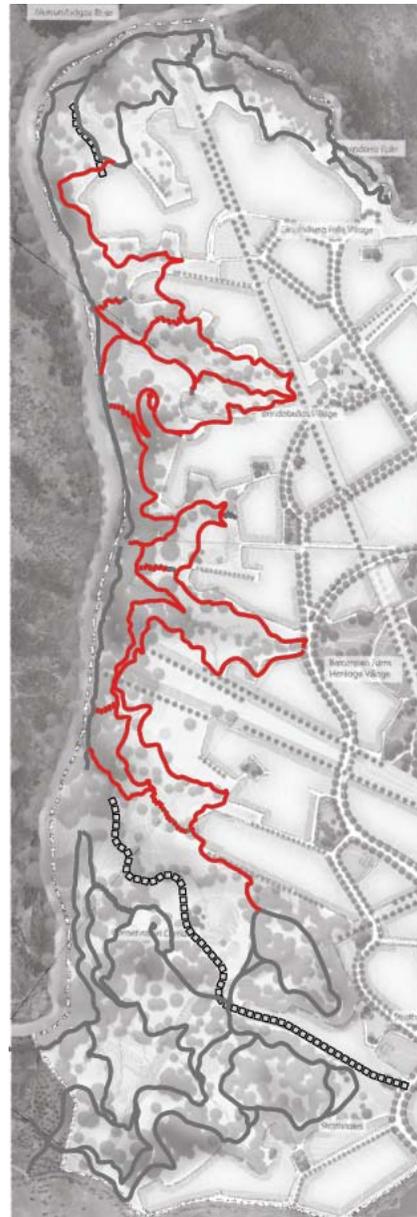
The stage avoids the creation of dead-end trails and limits the development to the area south of an unnamed creek which forms a natural boundary.

Stage 2

Seeks to utilise the natural attraction of Ginninderra Falls as a gift back to the community and selling point for the remainder of the development.

It is acknowledged that access to Ginninderra Falls is via private property so the timing of Stage 2 will be subject to the landholders consent.





Stage 3

The Stage 3 trails provide access to and along the river corridor for the adjoining urban areas.

It is likely that the trails identified as Stage 3 would be delivered as a number of sub-stages matching the progress of development adjacent to the river corridor.

Environmental approvals may also result in the sub-staging of trails on either side of the ACT/NSW border.

Stage 4

The Stage 4 trail links the first stage of development with the Ginninderra Falls area.

It is understood that some people are already making this walk despite it crossing private property. The desire for this link will increase with the reopening of access to the falls and the establishment of the Stage 1 urban development area.

Depending upon the timeframe for the Stage 2 trails and the resolution of land access issues, the provision of this trail may need to be brought forward.





Stage 5

The trails identified in Stage 5 are trails that don't neatly fall into the other categories.

The trails near Ginninderra Falls will be high cost and high amenity and should be delivered in parallel with the proposed discovery and visitor centres.

The trail linking the corridor with existing trails to the south (below Shepherds lookout) would also be high cost, high amenity trail. It stretches beyond the reserve boundary and should be delivered in consultation with the ACT Government.

The remaining trails in the Stage 1 area are additional trails that would provide options for loops of different length and difficulty. These trails should be provided if the demand arises.

2.11 Trail building techniques

The quality of trail construction has significantly improved in recent years with the growth of several professional trail development companies that utilise accredited techniques to minimise environmental disturbance, reduce ongoing maintenance costs and improve user amenity.

As a result, sustainable trails that minimise negative environmental impacts are being constructed in a cost efficient manner. Such trails tread lightly on the land utilising small machinery and hand tools for construction.

To achieve sustainable outcomes, trails must be designed and constructed so that water flows are managed and users are contained on the trail but the design must also allow for micro-alignment away from threatened species and sensitive areas. This is crucial to reduce erosion, sediment travel, track widening, shortcutting, proliferation, vegetation damage, and associated maintenance requirements.

The use of International Mountain Biking Association (IMBA) guidelines will help minimise impacts such as disturbance of soils and vegetation, reduced water quality, disturbance of wildlife, and damage to cultural and historical sites and park infrastructure. There are many techniques that can be employed to ensure that trails are built sustainably even on steep and erodible ground. While principally developed to inform the construction of mountain bike trails, the sustainable construction elements of the guidelines are also generally applicable to shared use and walking trails.

IMBA lists 11 principles for designing and locating sustainable trails to allow water to drain and to contain users on the trail.

- Locate the track on a sidehill: It is much easier to drain water away from a trail located on a slope than one on flat ground, and it is easier to keep users on the trail.
- Avoid the fall line: Trails should always climb or descend a slope gradually, rather than travelling directly up or down it. Trails that travel directly up or down hills (fall-line trails) create a path for water that erodes soil and creates gullies. Users then widen trails by trying to avoid the gullies.
- Use the 'half rule' to guide trail alignment: A trail's grade should never exceed half the grade of the sidehill it is located on. Grade is the elevation gained divided by the distance of the segment of the track (expressed as a percentage). A trail across a sideslope of 20% should not exceed 10%.
- Follow the 'ten percent average' guideline for sustainable grade: The average trail grade is the slope of the track for an entire uphill section. Generally, an average grade of 10% or less is most sustainable.
- Maximum sustainable grade: Typically, the maximum sustainable trail grade is about 15%.
- Grade reversals: All trails benefit from grade reversals every 6-16 metres. A grade reversal is a spot at which a track drops subtly and rises again, which forces water to drain off the track.
- Outslope: Most trails should be built with a 5% outslope. An outslope is a tilt on the downhill or outer edge of the track, which encourages water to sheet across and off the track in a gentle manner instead of funnelling down the track's centre.
- Adapt trail design to soil texture: Uniform soils dominated by one particle type (such as sand) are most sensitive. A mix of different types of soil particles drains well and holds together. The presence of rock and gravel can improve a soil's ability to withstand erosion.
- Minimise user-caused soil displacement: Soil displacement by users can be reduced by three tactics: consistent flow, insloped turns and armouring. Consistent flow avoids abrupt and inconsistent turns that make riders brake hard or skid. Insloped turns (or bermed turns) improve track flow and reduce skidding but are not ideal for shared trails and their use is to be discouraged. Armouring involves hardening the surface with gravel, rocks, and synthetic boardwalks. It can be used to elevate the track tread, especially in soft or wet terrain, or to armour the track against user-caused erosion.
- Prevent creation of unauthorised trails: Unauthorised trail creation can be reduced by having a stable and predictable surface and providing a high quality experience that meets users expectations and needs.
- Maintenance: Trail maintenance, as well as design, should focus on allowing water to drain off the track and containing users on the trail.

The majority of the suggested trails have been designed with multiple users in mind with pedestrians and bicycle riders traveling in multiple directions. Those multi-use trails located closer to the suburbs and significant facilities (i.e. identified recreation nodes along the river) will have a greater focus on recreational users (such as walkers, runners and bicycle riders) while those further from the suburbs will be designed with a view towards conservation and tranquility.

User conflict is to be managed through the use of signage (minimal), trail design and natural obstacles designed to reduce the speed differentials between users. The use of bollards, rails and similar urban furniture will be discouraged.

It is recommended that the majority of trails within the corridor be narrower trails (<1200mm). Construction of these trails will minimise ecological disturbance. Narrower trails have the added benefit of reducing the speed differential of users (particularly walkers and bicycle riders). When combined with choke points utilising the natural landscape, trees within the reserve and local rocks, potential speed differentials (on multiple use tracks) will be kept to a minimum.

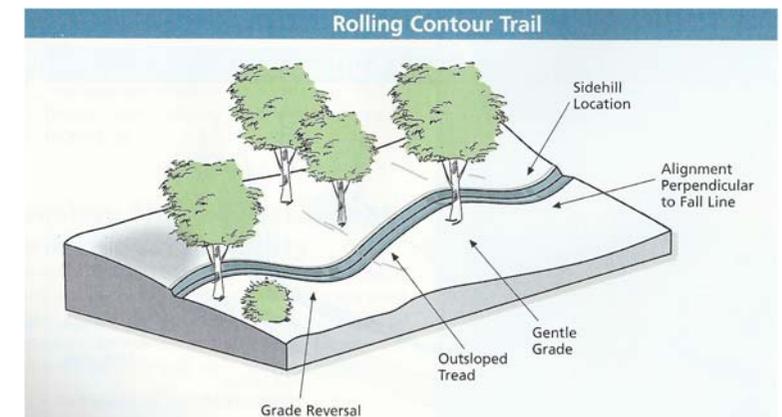
Directional signage should incorporate information that reminds users that some trails are multi-use and of the code of conduct emphasising respect for the unique environment and for all other users.

Unless otherwise specified, all design, documentation and construction for this project should be in accordance with the:

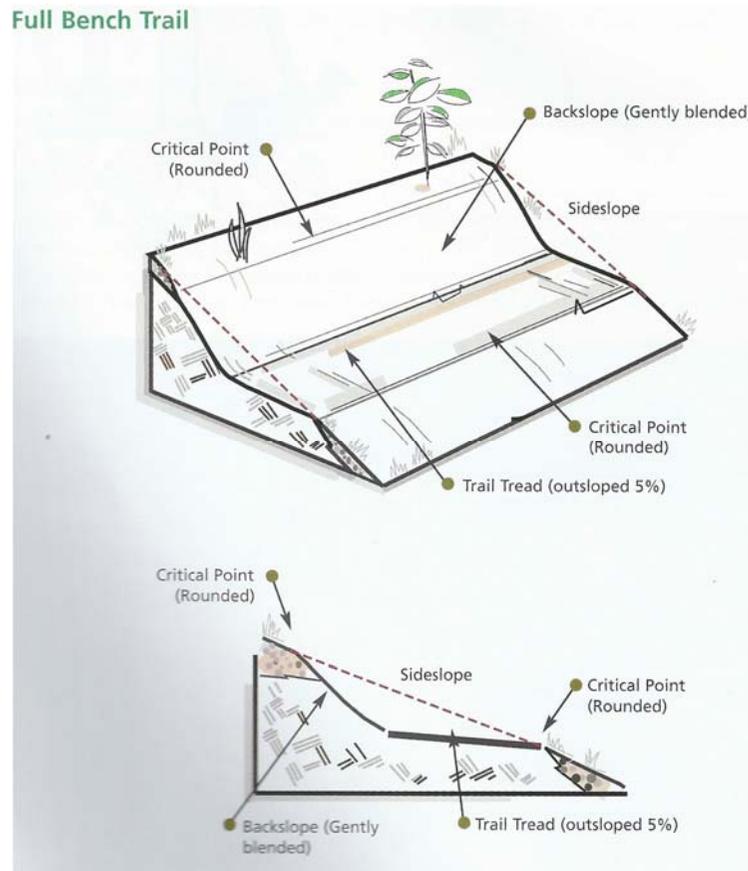
- Trail Solutions: IMBA's Guide to Building Sweet Singletrack, International Mountain Bicycling Association (IMBA), June 2004
- Managing Mountain Biking: IMBA's Guide to providing Great Riding, International Mountain Bicycling Association (IMBA), 2007.
- IMBA - Australia Trail Difficulty Rating System, IMBA - Australia 2012
- All construction work should comply with current and relevant Australian /New Zealand Standards which are available at www.standards.com relevant to working in a non-urban reserve area.

- The construction work must also comply with standards, guidelines, Acts and Ordinances currently in force in the ACT and NSW as applicable and relevant to working in a non-urban reserve area.
- All construction work must be undertaken in accordance with the relevant (to working in a non-urban reserve) environment protection measures outlined in: Environment Protection Guidelines for Construction and Land Development in the ACT 2007

Much of the terrain of the reserve is steeply sloped and rocky. To ensure trail sustainability and user safety all trails should be machine built, a minimum of 1200mm wide and utilise a rolling contour full bench (where appropriate) design.



Full Bench Trail



Source: Trail Solutions: IMBA's Guide to Building Sweet Singletrack, International Mountain Bicycling Association (IMBA), June 2004

A number of small bridges (~20) may be required within the trail network (subject to additional ground truthing of the proposed alignments). Further, approximately 6 potential viewing platforms or lookouts have been identified at key locations throughout the network. These viewing platforms make use of special views or highlight specific flora and fauna.

One specific boardwalk has been identified for the River Trail South underneath Shepherds lookout. If constructed, this trail would make use of ~500m of board walks (subject to ground truthing and engineering constraints) and could be the most spectacular walk or ride within the ACT.

Trail elements such as bridges and lookouts are to comply with AS 2156.2. Bridges are to be a minimum width of 1200mm wide unless otherwise specified.

2.12 Potential Conflicts

There exists potential for two main areas of conflict within the trail network:

- The conflict between conservation objectives and recreational use.
- User conflict between walkers, bicycle riders and horse riders (where permitted) on recreational trails.

2.12.1 Conservation

The largest threat to the ecological communities within the Reserve will be people. It is therefore paramount that the movement of people through the reserve is controlled in a thoughtful and appropriate manner. A well designed trail network that meets the needs of the community, minimises access to sensitive areas and directs users to key locations (e.g. river picnic areas) is a key tool to stop significant disturbance, protecting the ecological values of the site. Given the proximity of the site to existing and future urban development it is critical to cater for the inevitable human visitation.

Noting that there will be a degree of disturbance associated with the trails themselves, construction and final alignment should be undertaken in consultation with qualified and experienced ecologists to ensure that disturbance of sensitive ecological communities is kept to a minimum.

The number of trails also needs to be kept at the minimum amount in order to cater for the reasonably anticipated desire lines.

2.12.2 User conflict

The majority of proposed trails have been designed with multiple users in mind, with pedestrians and bicycle riders traveling in multiple directions. Those multi-use trails located closer to the suburbs and key destinations (i.e. identified recreation nodes along the river) will have a greater focus on recreational users (such as walkers, runners and bicycle riders) while those further from the suburbs will be designed with a view towards the primary objective of the reserve; conservation.

User conflict is to be managed through the use of signage (minimal) and other information to manage behaviour and expectations, trail design and natural obstacles designed to reduce the speed differentials between users. The use of bollards, rails and similar urban furniture will be discouraged.

The majority of trails within the corridor should be narrow trails (<1200mm) which will minimise ecological disturbance and reduce the speed differential of users (particularly walkers and bicycle riders). When combined with choke points utilising the natural landscape, trees within the reserve and local rocks potential speed differentials (on multiple use tracks) will be kept to a minimum.

There are a number of trail building techniques that are recommended to help ensure that walking only trails are not used by bicycles, these include signage, filter obstacles (for example, one or two steps from the shared trail to the start of the walking trail) and right angle junctions to avoid bikes inadvertently taking the wrong path.

2.13 Conservation Objectives

Trails provide opportunities for people to interact with the natural environment, thereby promoting environmental awareness and values. However illegal, poorly designed or poorly maintained trails may have adverse environmental impacts, including soil and vegetation disturbance resulting in reduced water quality, the disturbance of wildlife, and damage to cultural and historical sites and park infrastructure (11).

Surveys of the Reserve have identified know sites and significant potential habitat for Pink Tailed Worm Lizard (PTWL). Potential habitat for the PTWL consists of small shallowly embedded rocks within a grassy ecosystem. The species prefers sunny aspects as they utilise the rocks for thermoregulation.

The Commonwealth has published a set of Significant Impact Guidelines for the species (EPBC Policy Statement 3.12), which identifies the impact threshold considered to constitute a significant impact. Based on the guidelines, the following are considered to constitute a significant impact under the EPBC Act:

- Any impact within a patch <10 ha constitutes a significant impact.
- Any impact >0.5 ha in a large patch >10 ha

Given the significant size of the site (>10 ha) a trigger for significant impact within the habitat would be approximately 4 kilometres of trail (at 1.2m width). However, it is recommended that the Riverview trails be micro-aligned to avoid any impact to the identified areas. If any impact to potential habitat is likely, it is recommended that pre-clearance surveys be undertaken during a suitable season. If the species is detected during these surveys, every effort should be made to micro-align the trails to avoid direct impacts. If these measures can be adopted as part of the project, significant impacts to this species are unlikely.

It is understood that within the mapped habitat areas the habitat is not of uniform value and that opportunities for micro-alignment to avoid impacts will be available in many areas. It is also understood that natural surface trails of the type proposed do not constitute a significant barrier to the movement of PTWL and hence would not represent a fragmentation of habitat areas. Where more significant trail features are required, work in the Molonglo Valley is trialling the use of raised mesh platforms to avoid impacts.

It is recommended that the proposed trail alignments be investigated by a qualified environmental consultant to assess the anticipated level of impact and that more significant trail features are not established in mapped habitat areas.

3

Consultation

3.1 Consultation Methodology

An initial list of groups and contacts was developed based on parties that the project team considered to have an interest in the project (as identified in the proposal), and from contacts Riverview have developed during the ongoing consultation that has been undertaken to date for the West Belconnen Development. As the Trail Masterplan develops, more consultees may come to light, and will be added to the consultation list. As a first step in the consultation process an information package was sent via email to the following groups:

- Canberra Bushwalking Club;
- Brindabella Bushwalking Club;
- Canberra Off Road Cyclists (CORC);
- The Conservation Council ACT;
- Ginninderra Falls Association;
- Ginninderra Creek Catchment Group;
- Murrumbidgee River Corridor Trust.

Groups were requested to review the information and asked to provide a written response regarding their aspirations for the reserve area. The groups were asked to consider questions such as the following:

- What types of activities would you like to undertake?

- What sort of trails would you like to use?
- What features would you like incorporated in any new trails?
- What features would you like to visit in the area?
- Level of difficulty of trails.
- Linkages/loops.

Follow up phone calls were also made to ensure the emails were received, and telephone discussions were also held with some of the contacts.

A member of the project team also attended the West Belconnen 'Bush on the Boundary' Reference Group meeting held on 9th December 2015 and subsequent meetings. The December meeting was attended by approximately 12 representatives from many of the interested parties, this meeting had a focus on the Trails Masterplan and provided an opportunity to meet with a number of the relevant stakeholders.

Further to the initial consultation follow up meetings may be held with stakeholders to review the plan and provide further inputs and feedback into the development of the trails.

Prior to our undertaking consultation on this project, The Riverview Group had negotiated the proposed realignment for the Bicentennial National Trail with representatives from this group.

Table 2: Targeted Stakeholder Responses First Round of Consultation

Theme	Comment
West Belconnen Bush on the Boundary Group Meeting	
General	<p>This group would prefer the focus of the river corridor to be on conservation rather than recreation.</p> <p>This group acknowledges that there will be visitors and that they need to be managed and corralled to areas where they do the least damage.</p> <p>They are keen to set expectations and behaviour patterns from day one, to have the trails there and keep people on them.</p>
Access Road to Picnic Area	The proposed road down to the main picnic area should be kept at a slow speed limit, maybe gravel, narrow etc. to minimise the impact.
Types of Usage	<p>This group generally feels that most of the Canberra Nature Park is overrun by recreation and that the river corridor should maintain the primary focus on conservation.</p> <p>There was general discussion about mountain biking and the spectrum of users. Low level users, generally on fire trails seemed acceptable. Some single track links would be OK. However, high level MTB use, similar to something like Mt Stromlo on the River would not be supported.</p> <p>High intensity recreation (downhill mountain biking) would not be welcomed.</p> <p>The question was raised as to how trail bikes would be kept out of the area.</p> <p>This group generally agreed that the multi-use trail around the urban edge could be the focus for mass recreation, with the trails in the corridor being for more boutique, lower impact options.</p>
Walking	This group identified that people are already known to walk to Ginninderra Falls from Shepherds Lookout. When the stage 1 picnic area is opened this number will likely increase, therefore this needs to be considered and either catered for, or properly prevented.
Mapping/information/Signage	<p>This group raised a question regarding the signage overlay and interpretation that will be needed.</p> <p>There was discussion about mapping the significant Ecological and Heritage zones (as no-go zones).</p> <p>There is a desire for the trail maps to be available electronically and the group discussed developing an app to educate people as they walk. This might be something for the trust to consider.</p>
Brindabella Bushwalking Club	
General	<p>A question was raised as to whether the Pink Tailed Worm Lizard Habitat areas will be unfenced and available for bushwalkers to traverse without the need to be on formed tracks, as this group would like to be able to bushwalk both on and off the tracks in the area.</p> <p>Questions were also raised as to whether motorised vehicles and motorcycles would be prevented from accessing the trails and tracks.</p>
Separated trails	Would like consideration of a parallel path beside trails to separate cyclists from pedestrians. For example, to visit the Ginninderra Falls lookout.

Theme	Comment
Types of trails	<p>This group would be unlikely to use sealed trails unless there was no alternative. Our preference would be for narrow single tracks.</p> <p>They would like some of the trails to have an advanced degree of difficulty, so as to provide a level of challenge, but this is not essential as our walk leaders build this into off-track portions of their walks.</p> <p>Bushwalking clubs will generally be trying to create two types of loop walks - ones that occupy around 2 hours, and other longer ones of up to 5 hours. Realistically, though, these longer walks may be difficult to achieve in this area. We wouldn't expect that these aims would be directly provided for, but we would suppose that we could fashion a few walks to this end without encountering fences or other barriers, without retracing too many of our steps, and without transiting the urban housing areas.</p> <p>Would like to be able to complete loops (back to the cars) without encountering barriers and urban areas.</p>
Features	<p>We would not be seeking any particular features that weren't already being supplied at the various picnic areas, etc.</p> <p>We would like to visit all lookouts and 'highlights', developed and undeveloped; we would also endeavour to descend to Ginninderra Creek, Ginninderra Falls and the Murrumbidgee River unless this was expressly forbidden by law.</p>
Parking	<p>Parking, say for up to 8 vehicles, will need to be provided where many of the trails start. These will be needed by both walking groups and cycling groups.</p>
Canberra Bushwalking Club	
General	<p>The Canberra Bushwalking Club periodically organise walking events in the area</p>
Types of trails	<p>Would discourage the use of multi/shared use trails between cyclists, walkers and equestrian users. The experience from the development of the Centenary Trail demonstrates the problems with shared use trails; some sections of the trail, such as that near One Tree Hill, are too narrow to accommodate both walkers and cyclists - many walkers feel unsafe on these sections, as numerous cyclists ride very quickly along them.</p> <p>If trails must be shared between walkers, they should be designed to be wide enough to safely accommodate both types of users and incorporate appropriate safeguards to slow down cyclists.</p> <p>Equestrian trails should be kept separate to those of other users for reasons of safety and sanitations (ie proximity to a large animal and horse droppings)</p>
Management of conservation values and compatibility with recreation	<p>We feel that a specific strategy to ensure the compatibility of recreational development with conservation/heritage values must be included, in line with current national and local environmental and land use management legislation - for example, how the incursion of invasive weeds into the reserve will be minimised or littering in the area of Ginninderra Falls will be avoided (a problem with vehicular access too close to the Falls in the past). In a related vein, we would discourage the development of new trails, as compared with upgrading existing tracks to preserve the natural beauty and values of the area.</p> <p>Some CBC members have specific suggestions for ways to improve access to, and use of, trails in the area. They would like to share and further discuss these ideas in more detail.</p>

Theme	Comment
The Conservation Council	
Types of trails	<p>Concerned with the types of trails and treatments that will be proposed.</p> <p>Need to carefully consider walking trails vs cycling trails and how they relate. Many prefer to have them separate.</p>
	<p>This is likely to be a very popular area, vehicular access will need to be provided.</p>
	<p>The Ginninderra Falls area and the paths in the vicinity of this will also come into play early on. There is a group of people working towards getting the Ginninderra Falls area open and accessible in 3-5 years. People already break into this area to access Ginninderra Falls.</p>
Ginninderra Creek Catchment Group	
	<p>Have done some recent work in the Falls area</p>
	<p>Concerned primarily with biodiversity and Aboriginal and Cultural Heritage issues</p>
Canberra Off-Road Cyclists	
Sustainable trails	<p>A key consideration that CORC is most interested to see observed is the construction of sustainable MTB trails, that benefit the environment, rather than having negative impacts. This has been demonstrated at Bruce Ridge and numerous places worldwide. Construction of sustainable trail can be achieved with relatively little effort, often not requiring the use of machinery. Volunteer organisations such as CORC are able to build sustainable trails and could save significant cost, which could be reinvested elsewhere. Although we do accept that the use of volunteer trail builders would be a much slower process.</p>
Trail types	<p>CORC would like to see a variety of options included in the new development, these options would cover a number of riding styles and would have options for all skill levels.</p> <p>The plans show that there is a plan to have an unsealed path along the entire perimeter of the development area, which is excellent. It is assumed that this path would be fairly wide and open, suitable for most riding abilities. With that in mind CORC would like to see more technical options if possible, these would be diverted away from the main trail, suitable for more skilful riders, before rejoining the trail. These could be short or longer sections, possibly even offering a full-length alternate trail.</p> <p>Another trail CORC would like to see would be a short course MTB track. Short course MTB is a dirt version of the classic velodrome racing, but we host a short (800-1000 meters) and fun style of MTB racing, on courses that do not feature very advanced trail features. The trails can be any shape, be it oval, hour glass, or anything in between. As the races can attract a number of people a suitable plot with access to parking would be required.</p>
Trail management/maintenance	<p>The trails could be set up to be managed by a specific Parkcare group, similar to Bruce Ridge, Majura, Pine Island, etc.</p>
Trail connections	<p>Will linkages to the Tuggeranong-Stromlo-West Belconnen trail that Dowse Projects is constructing be considered?</p>

Theme	Comment
Other recreational/cycling related features	<p>One type of trail that is currently enjoying great uptake worldwide is the 'pump track' concept, these are small, relatively uncomplicated tracks designed to teach riders about technique and bike handling. Given there are several sets of ovals in the development, having a small pump track at each oval would give a lot of people access to the tracks, which could be built with options for advanced through to novice abilities, and options suitable for small children on kick bikes. These tracks can be manufactured from dirt or other materials and allow people to develop skills in a low threat/consequence environment and have proven to be suitable for urban environments.</p> <p>CORC is also of the view that a BMX track within the development would also be worthwhile. CORC are not the ACT's representatives for BMX riding, but we support the development of a facility that would suit grades from beginners to advanced riders.</p>

As the plans for trails in the corridor evolve from master planning towards implementation there will be an ongoing need to consult with these stakeholder groups. While each group has a different focus it is considered possible to present a trails master plan that caters for the majority of their aspirations with the following exceptions:

- Long wilderness style bush walks will not be possible due to the proximity to the urban area and the size of the reserve. Shorter, high amenity walks will be possible.
- Separate trails for all user groups will not be possible as this would require substantially more trail to be constructed at greater financial and ecological cost.
- Highly adventurous mountain biking (racing, downhill or pump tracks) will not be catered for as this would be contrary to the primary conservation objectives of the reserve. These disciplines of cycling may be catered for within the urban areas of the West Belconnen development.

Overall, it is considered that a network consisting of a combination of shared, accessible and walking only trails will cater for the majority of stakeholder requirements.

3.2 Potential Risks and Mitigation Measures

In preparing this master plan a number of potential risks have been identified that warrant specific consideration. The table below identifies the risks and provides a discussion of the proposed mitigation measures.

Table 3 - Potential Risks and Mitigation Measures

Potential Risk	Mitigation
Environmental Impacts	<p>The primary objective of the Reserve is conservation however, given the proximity of the urban environment, human visitation is inevitable. A trail master plan is required to anticipate the likely origins and destinations within the Reserve and provide a trail network that caters for these visitors. Without the trail network visitors will make their own way through the reserve most likely resulting in much greater environmental impact.</p> <p>The development of trails is a mitigation measure against uncontrolled visitation to the reserve. The alignment and the design of trails will ensure that they are constructed and maintained with the least possible impact.</p> <p>Prior to construction, micro alignment of trails will further reduce this impact.</p>
Over Used	<p>The provision of trails and the associated amenity they provide has the potential to attract more people to the river corridor than would normally visit. While this would bring benefits to the community through increased health and environmental awareness, it could be detrimental to the trails themselves if they are overused.</p> <p>Over used trails will require additional maintenance and may also result in user conflict.</p> <p>The primary mitigation measure against over utilisation is the understanding of utilisation rates of trails within Canberra Nature Park in similar locations. If the trails are utilised at similar rates to those in Canberra Nature Park then they will be well within their maximum capacity.</p> <p>In some cases, if the trails are being used beyond their capacity, then they may need to be widened or have the trail surface hardened (rock armoured or converted to boardwalk) to reduce maintenance requirements.</p> <p>As with all public infrastructure, an element of adaptive management will be required to monitor the utilisation of trails and adjust the maintenance regime accordingly.</p>
Under Utilised	<p>The risks associated with underutilisation relate to wasted investment in the creation of trails and then an ongoing maintenance liability without a commensurate return of value to the community.</p> <p>Trails that are poorly designed, in poor condition, with low amenity or that do not cater for natural desire lines are most likely to be underutilised. Also, if many more trails than are necessary are provided then they may all be underutilised.</p> <p>The matters relating to design, amenity and desire lines are catered for in this master plan where the proposed trail alignments seek to address these considerations.</p> <p>The total number of trails has been dictated primarily by the number of origins and destinations, however the density of trails in the environment is not considered to be excessive. It is comparable to many of the existing and successful areas of Canberra Nature Park where conservation objectives are being met around the urban fringes of Canberra.</p>

User Conflict	<p>User conflict is a significant risk where shared use trails are proposed.</p> <p>The primary mitigation measure is to manage the expectations of trail users through education. Within the Reserve the user groups will primarily consist of walkers, runners and bicycle riders. Walkers and runners will tend to be more accommodating of bicycle riders if they are aware of their potential presence and know that they are legitimate users of the trail.</p> <p>Bicycle riders need to be aware that other users will be on the trail and that they must give way to them. As the trails would not be promoted as 'mountain bike trails' users seeking a higher speed or more technical experience would be encouraged to go to one of the mountain bike specific trail locations that are available elsewhere in the ACT. Visitors to the Reserve would be expected to be low impact recreational cyclists.</p> <p>The physical design of the trails will also help to reduce the potential for conflict by minimising gradients and the length of descents to avoid high speed cycling. Providing natural trail features that slow bikes down and keeping the trails relatively narrow which tends to reduce travel speeds.</p> <p>In addition to signage, walking only trails would also be demarcated with filter elements to prevent cyclists inadvertently riding on walking only trails.</p>
Costs - Construction	<p>The costs for the construction of trails of this nature are becoming well known following the construction of extensive new and upgraded trails in the Canberra region. Natural surface trails have been created or upgraded at Majura Pines, the Centenary Trail, the Arboretum, Tidbinbilla Nature Reserve and many other locations recently.</p> <p>The risks associated with construction costs can be managed through procurement processes. If the quoted construction costs exceed the project budget (including contingencies) then it may be possible to redesign some sections of trail to avoid the higher cost items prior to financial commitments being made.</p>
Costs - Maintenance	<p>The creation of a trail network will result in a long term maintenance liability. This is unavoidable but the maintenance costs can be minimised if the trails are appropriately located and constructed initially. Trail maintenance costs are reasonably well understood and can be budgeted for.</p>
Incident Liability	<p>In all public places the custodian of the land is required to have public liability insurance. Where trails are constructed (and in particular where people are expected to walk or ride on natural surface trails which may change condition with the weather) there will be a duty of care placed upon the custodian to provide suitable trails. This duty of care can normally be demonstrated through the provision of trails built to the standards identified in this master plan, and through the provision of a pro-active maintenance regime.</p> <p>On ACT Government land such as nature parks, or mountain biking areas the public liability coverage is wrapped up with the same policies that cover footpaths, skate parks and other public places. The custodian of the Reserve will need to provide a similar policy which will cover all likely public activities in the Reserve, including use of the trail network.</p>

4

Trail Design Rationale

4.1 Why do we need trails?

Trails provide the community and the environment with a range of benefits.

- **Conservation and the environment.** One of the largest impacts upon the environment is that of people. By controlling people and shaping the way they interact with the landscape, trails can assist in minimising and managing their impact upon the landscape. Well-designed trails that allow people appropriate access to interesting locations, keep people within a predefined corridor, allowing land managers to keep them away from and educate them about sensitive environments and significant heritage locations. In essence trails allow humans to experience nature with minimal environmental impact.
- **Active Living.** Active living is a way of life that integrates physical activity into daily routines. Building facilities that encourage physical activity promotes significant co-benefits throughout the entire community. (4) The development of an appropriate trail system that encourages every day physical activity and access to the natural environment will promote the benefits of active living.
- **Transport and Liveability** - Trails are a crucial element to a seamless urban multi-modal transportation system. Canberra, through the Active Travel Framework has recognised the importance of the off road trail network. (13) By incorporating trails and similar facilities the ability to access and travel through natural areas on foot or by non-motorized means is a large factor in building a community's liveability.
- **Health benefits.** The health benefits of trails can be identified both in terms of physical and mental health benefits. Trails create healthy recreation and transportation opportunities for people of all ages by providing them attractive, safe, accessible and low-cost places to cycle, walk, hike, ride and run. Trails help people of all ages incorporate exercise into their daily routines by connecting them with places they want or need to go. Physical activity guidelines identify 30 minutes of moderate physical activity every day (14) Communities that encourage physical activity, through changes to the urban environment see significant improvements in public health and wellness.
- **Social and Community benefits.** Trails can assist in building and strengthening community by providing opportunities for exercise that encourage incidental community interaction. Trails can serve as a meeting place for the community providing an opportunity to interact with people of varying backgrounds, and experiences, they foster community involvement and build community pride.

- **Tourism and Economic impacts** - The development of trails brings tourism benefits, increases visitors and helps establish, maintain and grow local business. (15) Local evidence, backed up by national and international experience suggests that users will travel to the area to utilise trail infrastructure if interesting, constructed well and leading to significant destinations. The economic effects of trails are sometimes readily apparent (as in the case of trailside businesses) and are sometimes more subtle, like when a company decides to move to a particular community because of amenities like trails. There is no question, however, that many communities have experienced an economic revitalization due in whole or in part to trails. (16) (17)
- **Heritage** - Trails have the potential to highlight and provide access to historic and cultural locations and resources. There are several significant heritage locations within the study area and the trails can be used as a tool to help to educate the local community about their significance and protect these precious links to the past.

4.2 Why not just follow the old trails?

There are a significant number of existing utilitarian farm tracks that cross the study area. While some of these tracks may be able to be incorporated into the proposed trail network, the majority of these are not suitable for recreational or ongoing management purposes.

Most trail users prefer narrower trails when walking, hiking, running or riding through the natural landscape. This allows the user a closer connection to the natural environment. Farm track and major management roads tend to push through the environment in straight, steep lines rather than winding around obstacles and utilising the topography and are therefore not attractive to recreational users.

Origins and trip generators for the trails within the study area include, but are not limited to, key points on the urban edge, community facilities, greenways, schools and shops. While destinations include lookouts, proposed recreational areas and the river itself. The majority of existing farm tracks do not go from identified points of origin to key destination points and are therefore not appropriate to use.

Where possible and appropriate, the trails masterplan has sought to reuse these farm tracks in order to minimise impact upon the landscape, play homage to the previous use of the landscape and reduce costs. Farm tracks that are not identified within the trails masterplan and not needed for management or fire fighting purposes should be closed and rehabilitated.

4.3 Why are the majority of trails Shared?

The majority of trails identified within this masterplan are defined as multiuser trails. The reasoning behind this management approach is five fold: (18)

- Multiuse trails meet the needs of the most users and manage most visitors. They can be used to manage most user groups and disperse them throughout the entire system rather than concentrating them in single locations. This reduces maintenance costs and removes the negative social impacts of over crowding and can build a sense of community. Further, most points of interest (lookouts, waterfalls and key recreations places) are points that all users want to visit, by providing multiuse trails all users can visit these areas.
- Multiuse trails assist in building community with all users encouraged to cooperate to preserve and protect a common resource.
- Multiuse trails are cost effective in a range of measures:
 - They are cheaper in terms of construction requiring fewer steps and built features.
 - There is comparatively less trail needed to meet all user needs reducing immediate constriction costs.
 - They are comparatively easier to maintain and keep open. This has been seen with areas of the Canberra Centenary Trail where some areas of single use (walking only) trail are becoming overgrown with ground cover rather than developing into a readily identifiable trail pad.
- Multi use trails empower responsible experienced users. Inexperienced and novice users are exposed to conscientious, courteous users and the opportunity for peer regulation is enhanced.
- Multiuse trails minimise the number of trails needed to meet users needs and therefore better utilise available space leading to lower impact upon the environment.

5

Stage 1 Trail Descriptions

Trails are proposed with a range of potential users in mind. Users catered for will range from local families, recreational walkers, trail runners, hikers, bushwalkers and mountain bike enthusiasts.

Each trail is described in detail using the following format:

- **Identifier:** Trails will have a unique identifier.
- **Expected user profile:**
- **Description:** Describes the nature of the trail and what users are likely to see including points of interest in the reserve, including historical sites, waterfalls, plus other environmental, aboriginal and historic interpretation opportunities for walkers and riders.
- **Length:** Identifies the total length of the trail.
- **Trail type:** Multi-use, Active-user.
- **Design:** Width, slope and gradient, all access, required infrastructure (rest stops and bicycle infrastructure) etc.
- **Issues:** Identify issues that are relevant to trail construction, these might include endangered species communities, sites vulnerable to erosion, road crossings (unlikely), rocks, bridges, steep side slopes. This will include approximate locations for emergency vehicle access.
- **IMBA Rating:** Rating from white (family), Green (easy), Blue (intermediate). Note it is not anticipated that any trails identified will qualify as either Black Diamond (Advanced), Double Black Diamond (very advanced) trails.
- **Australian Walking Track Grading System Rating:** All trails will be rated between 1 (all access) and 4. There will be no level 5 trails located within the reserve.
- **Construction Rating:** Difficulty of construction
- **Priority:** Priority of construction
- **Cost:** Potential cost of trail (using commercial rates)
- **Ongoing Maintenance Costs:** per annum costs of maintaining that section of trail

5.1 Urban Edge Trail

Expected user profile: Families, residents, equestrians, active users, fire and maintenance vehicles

Description: The Urban Edge Trail was identified in the Landscape and Open Space Strategy and has not been redesigned as part of this masterplan. The initial design of the urban edge trail follows very closely to the edge of the urban environment utilising, in many areas the asset protection zone.

The Draft Management Plan (1) recognises that the interface between the Reserve and the West Belconnen urban area will be a critical area for management with the intention that it be managed to:

- The conservation and recreation objectives of the Reserve
- Provide appropriate buffers between reserve and urban land uses
- Ensure the health and safety of visitors and residents
- Maintain compatibility with the sustainable urban design principles and practices underlying the West Belconnen development.

There are opportunities for this trail to intersect and be realigned with trails identified below. Realigning and defining this trail to better follow the contours of the land will better enhance amenity for the community and recreational users. This will provide additional amenity to the residents of the area, increase trail legibility and allow quick access to other trails (and suburbs upon return) within the reserve and allow users to disperse relatively quickly providing increased amenity for all users. The proposed alignment of this trail will need to be resolved in conjunction with the design of the adjoining suburban areas.

This trail is also identified as a specific equestrian trail and the realignment will allow for improved equestrian amenity.

Length: N/A.

Trail type: Multi-use management trail.

Design: 6000mm, maximum gradient of 10%.

Issues: This will be a highly utilised section of trail given its proximity to the urban area. Given the likely number and mix of users (including heavy maintenance vehicles) and the purpose of this trail in defining the urban edge this trail must be constructed to a standard acceptable to emergency services.

IMBA Rating: White.

Australian Walking Track Grading System Rating: 2.

Construction Rating: 4 (relative complexity and hence cost of construction)

5.2 Strathnairn Residents Trail

Expected user profile: Families, day visitors, active users and bicycle riders

Description: The Strathnairn residents trail, like the Woodlands link is designed to protect the Yellowbox Grassy Woodland while providing amenity to the urban area. Again the trail is designed to minimise desire lines and control the flow of the majority of people entering this area. This trail makes use of both undulating terrain within the Yellowbox Grassy Woodland and the steeper slopes in the southern part of the reserve. The trail provides a direct, off road link to the spectacular Shepherds lookout. This trail link is predominately undulating and links with the Strathnairn Woodlands link, the Shepherds Lookout trail and Southern Upper Strathnairn Trail.

Length: 4500m.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 3

5.3 Shepherds Lookout

Expected user profile: Families, day visitors, active users and bicycle riders

Description: This trail links the existing Shepherds Lookout Trail with the River Trail South, the Strathnairn Residents Trail and the Southern Upper Loop Return Trails. It does this by utilising much of the existing management and farm trails. This trail provides users with a link between the lookout and the remainder of the conservation reserve.

Length: 1800m.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 1

5.4 Upper Southern Loop return

Expected user profile: Families, day visitors, active users and bicycle riders

Description: The Southern Upper Loop return links the Picnic Area with Shepherds Lookout and the Strathnairn Woodland Link. Paralleling the river on the mid slope the trail gradually climbs to the south entering several smaller secluded valleys before linking with the Shepherds Lookout on a large flat area above the river corridor.

Length: 2700m.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 3 to 4

5.5 River Trail South

Expected user profile: Families, day visitors, active users and bicycle riders

Description: Only the first part of this trail would be delivered as part of Stage 1, the remainder would be part of Stage 5. Potentially the most spectacular of all the trails in the Reserve the River Trail South links the Picnic Area, Shepherds Lookout and the Murrumbidgee Walking Trail in the Molonglo valley below the Molonglo water treatment plant. The trail heads south gradually climbing and following the old farm road well above the river. At the point the trail intersects with the Shepherds Lookout trail it turns south west and makes its way below ~75m below Shepherds Lookout proper. This section of trail hugs the cliff face and provides for unprecedented views along the entire length of the conservation area. If constructed this trail will undoubtedly be the most spectacular trail within the development. If done well, this signature trail would be able to be used in marketing material and as a promotional vehicle for the entire development. Much of this trail will need to incorporate boardwalks (fiberglass reinforced plastic). Improved links to the Murrumbidgee Walking Trail and the Molonglo River Park will need to be further explored.

Length: 2800m

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Blue

Australian Walking Track Grading System Rating: 3.

Construction Rating: 3-5

5.6 Strathnairn Loop

Expected user profile: Families, day visitors, active users and bicycle riders

Description: The Strathnairn Loop is designed to protect the Yellowbox Grassy Woodland as well as PTWL habitat while providing amenity to the urban area. The trail is designed to minimise desire lines and control the flow of the majority of people entering this area. This trail makes use of undulating terrain within the Yellowbox Grassy Woodland, spectacular views over the river corridor and the steeper slopes in the western and southern parts of the reserve. The Strathnairn Loop also incorporates a small out and back lookout point located above PTWL habitat. This lookout location should be used as a primary education point for PTWL and incorporate significant interpretative signage informing uses of the species, its habitat and how to minimise the impact of human disturbance. This trail provides a pedestrian link to the Picnic Area through a series of (~13) staircases. It also links with the Upper Southern Loop Return and the Woodlands link allowing users to create a series of stacked loops to extend their walk or ride.

Length: 1800m

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 3

5.7 Strathnairn Woodlands Link

Expected user profile: Families, day visitors, active users and bicycle riders

Description: The Strathnairn Woodlands link is designed to protect the Yellowbox Grassy Woodland while providing amenity to the urban area. The trail is designed to minimise desire lines and control the flow of the majority of people entering this area. This trail is predominately undulating and links with the Northern Strathnairn Link, the Strathnairn Residents Trail, the Strathnairn Loop and Upper Southern Loop Return.

Length: 2600m.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 3

6

Possible Future Trails

Beyond Stage 1 the following trails are described as possible future trails. Refer to the attached map for trail locations.

6.1 Southern Upper Strathnairn

Expected user profile: Families, day visitors, active users and bicycle riders

Description: This short section of trail links the Upper Southern Loop Return and Strathnairn Residents trail. It travels across a relatively steep slope through a northwest facing semi-mature forest environment. The trail makes use of the forest to provide shade and glimpses to the river beyond.

Length: 900.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 3

6.2 South Central mid trail

Expected user profile: Day visitors, active users and bicycle riders

Description: This trail links users between the proposed southern recreation reserve and the central recreation reserve (border reserve) making use of the Heritage View from the Belconnen Farm. The trail climbs gradually to a lookout point located on a large rock outcrop within the power line easement. This lookout offers uninterrupted views of the Murrumbidgee corridor both north and south. From the point the trail descends to the central picnic spot through the Belconnen Heritage View. This trail will make a perfect accompaniment to the River Trail Centre South allowing users to complete a loop between the two picnic locations. A small series of linking staircases (approximately 6) are also proposed to link the South Central Mid Trail and the River Trail Centre South allowing for shorter loops and increased amenity.

Length: 2700.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 3.

6.3 Northern Strathnairn Link

Expected user profile: Families, day visitors, active users and bicycle riders

Description: The Northern Strathnairn Link is a key linking trail between the proposed urban area and the initial picnic/recreation area identified in the structure plan. The trail does this by joining the South Central Mid Trail at two key points. The first, utilises a series of staircases (~14) that run east west between and away from areas of PTWL habitat. These staircases will provide a direct pedestrian only link between the urban area and the picnic area. The trail extension will lead pedestrians and cyclists to the lookout point identified in 5.4 South Central Mid Trail. This trail also provides a direct link to the Strathnairn Woodlands link.

Length: 2100m.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green

Australian Walking Track Grading System Rating: 3

Construction Rating: 4

6.4 River Trail Centre South

Expected user profile: Families, day visitors and active users

Description: This trail links users between the proposed southern recreation reserve and the central recreation reserve making use of the river corridor. Located above the observed high water mark, the trail winds among the casuarina trees and makes use of the gentle sloping terrain above the corridor. By combining this trail with the South Central Mid Trail users will be able to complete a 4km loop between the two picnic areas. A small series of linking staircases (approximately 6) are also proposed to link the South Central Mid Trail and the River Trail Centre South allowing for shorter loops and increased amenity.

Length: 1200m.

Trail type: Walking only, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 3

6.5 Southern Belconnen Farm View Trail

Expected user profile: Families, day visitors, active users and bicycle riders

Description: This trail links with, the Northern Belconnen Farm View, the South Central Mid Trail, and the Northern Strathnairn trail. Utilising the heritage views from Belconnen Farm this trail gradually contours the southern slopes of the Belconnen farm view valley until it meets the lookout described in 5.4 the South Central Mid Trail.

Length: 1600m.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 3

6.6 Northern Belconnen Farm View Trail

Expected user profile: Families, day visitors, active users and bicycle riders

Description: This trail links with the Central Lookout Entry, the Southern Belconnen Farm View and the South Central Mid Trail. Utilising the heritage views from Belconnen Farm this trail gradually winds its way down to the river corridor providing access to the central recreation reserve (border reserve). There are several sections of linking stairways (~10 staircases) to provide additional amenity to residents and to allow for a stacked loop trail system for more active trail users. This trail straddles both the ACT and NSW.

Length: 2200m.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green

Australian Walking Track Grading System Rating: 3.

Construction Rating: 3

6.7 River Trail Centre North

Expected user profile: Families, day visitors, active users and bicycle riders

Description: This trail links the second central Picnic Area (on the NSW/ACT Border) to the third Northern picnic spot (first in NSW). Users will be treated to a tree lined river experience with the trail largely following the existing management trails that skirt the edge of the Murrumbidgee River. This trail is located entirely in NSW.

Length: 1500m.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 2

6.8 Central Lookout Entry

Expected user profile: Families, day visitors, active users and bicycle riders

Description: This trail links with the River Central Lookout Touch Point, the Central Lookout Northern Link, the Belconnen Farm View (Northern Alignment) and the River Recreational Trail Centre North. Remaining high above the river this trail climbs to the lookout described in 5.18 River Central Lookout Touch Point. The trail climbs through a small section of sclerophyll forest winding through mature trees and among spectacular granite tors. The trail climbs up the slope utilising two switchbacks (the only switchbacks in the entire design), switch back anchor points should be located near significant view points and or natural features (i.e. significant trees or boulders). A short section linking the River trail allows for quick pedestrian access to the river and allowing for a stacked loop.

Length: 1400m.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 2

6.9 River Central Lookout Touch Point

Expected user profile: All Access, Families and day visitors

Description: This short link provides access from the urban area to the Central lookout. The lookout will be constructed among the boulders on this hill and will provide spectacular views both 270-degree views along the entire river corridor. This trail and lookout should be constructed to meet current disability standards (AS 1428.1). Similar to the Strathnairn Loop this area has been identified as potential PTWL habitat. This lookout location therefore should be used as an education point for PTWL and incorporate significant interpretative signage informing users of the species, its habitat and how to minimise the impact of human disturbance.

Length: 400m.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: White.

Australian Walking Track Grading System Rating: 1.

Construction Rating: 1

6.10 Central Lookout Northern Link

Expected user profile: Day visitors, active users and bicycle riders

Description: This large section of trail links to the River Trail Centre North, the Central Lookout, the River Trail North and the Ginninderra Falls Rim Trail. Touching the proposed urban area in a number of locations this trail aims to protect the environment while providing for access for residents and visitors to the river corridor. The spectacular ridgeline and valley side trails make use of the existing forests and trees providing both shade and amenity while taking advantage of the glorious filtered valley views of the Murrumbidgee Corridor. This trail has several linking sections that incorporate ~12 staircases designed to allow pedestrian faster access to the river corridor and to allow for shorter active user links providing for a series of stacked loop trails. This trail is located entirely in NSW.

Length: 5200m.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 3

6.11 River Trail North

Expected user profile: Families, day visitors, active users and bicycle riders

Description: Heading south along the Murrumbidgee River this trail links the Discovery Centre to the third Northern picnic spot (first in NSW). Users will be treated to a tree lined river experience with the trail cut into the slope 10m above the water. This largely treed section will provide filtered views down to the river. A small stairway link off this trail provides access to a small private rock platform. This trail is located entirely in NSW.

Length: 2300m

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 1

6.12 Ginninderra Falls Rim Trail

Expected user profile: All Access, Families, day visitors, active users and bicycle riders

Description: This trail links the top of Ginninderra Falls with the (proposed) Visitors Centre and then follows the ridgeline to an area above the confluence of Ginninderra Creek and the Murrumbidgee River before gradually descending to the location of the (proposed) discovery Centre.

From the Visitors centre heading east the trail will wind its way to the head of Ginninderra Falls where a large viewing platform will be erected to cater for people to see the falls. This trail has been designed to be all access allowing for people with disabilities to easily access the spectacular vista. This trail and lookout should be constructed to meet current disability standards (AS 1428.1).

Heading west from the Visitors Centre the trail meanders through the trees, largely following the ridgeline. Above the confluence of the Ginninderra Creek and the Murrumbidgee River a second lookout point is proposed. This will be located (subject to further ground truthing) close to or under the power line easement. From this point the trail heads south along the Murrumbidgee river Corridor gradually dropping down to the new Discovery Centre.

These trails are entirely located in NSW.

Length: 3200m.

Trail type: Multi-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

IMBA Rating: Green.

Australian Walking Track Grading System Rating: 3.

Construction Rating: 4

6.13 Ginninderra Falls to Discovery Centre

Expected user profile: Families, day visitors and active users

Description: Following the Murrumbidgee River, this trail meanders up the Ginninderra Creek to the base of the falls providing users with unprecedented views of this natural wonder. Subject to ground truthing several large sections of rock slab will add to the special felling of this trail. Several linking sections including significant stairways between this trail and the Ginninderra Rim Trail and visitors centre are also proposed. This will allow for a spectacular 5km hiking loop.

Length: 2100m.

Trail type: Single-use, Active-user.

Design: 1200mm, maximum gradient of 10%.

Issues: Significant stone sections may reduce cost however, there is significant potential for the need for boardwalks and lookout points along this trail. Emergency vehicle locations will be accessible from the Ginninderra Falls Visitors Centre or the Proposed Discovery Centre. Several linking sections including significant stairways between this trail and the Ginninderra Rim Trail are also proposed.

IMBA Rating: Blue.

Australian Walking Track Grading System Rating: 4.

Construction Rating: 4

7

Estimated Costs

Table 4 - Estimated Construction & Maintenance Costs

	Trail Name	Length (m)	CR	Cost Estimate	Maintenance Estimate	Stage
1	Urban Edge Trail					
2	Strathnairn Residents Trail	4500	3	\$ 247,500	\$ 12,375	1
3	Southern Upper Strathnairn	900	3	\$ 49,500	\$ 2,475	5
4	Shepherds Lookout	1800	1	\$ 31,500	\$ 1,575	1
5	Upper Southern Loop return	2700	3.5	\$ 162,000	\$ 8,100	1/5
6	River Trail South	2800	4.5	\$ 196,000	\$ 9,800	1/5
7	Strathnairn Loop	1800	3	\$ 99,000	\$ 4,950	1
8	Strathnairn woodlands link	2600	2	\$ 117,000	\$ 5,850	1
9	South Central mid trail	2700	3	\$ 148,500	\$ 7,425	3
10	Northern Strathnairn Link	2100	3	\$ 115,500	\$ 5,775	3
11	River trail Centre South	1200	3	\$ 66,000	\$ 3,300	4
12	Belconnen Farm View Southern	1600	3	\$ 88,000	\$ 4,400	3
13	Belconnen Farm View Northern	2200	3	\$ 121,000	\$ 6,050	3
14	River trail centre North	1500	2	\$ 67,500	\$ 3,375	4
15	Central Lookout Entry	1400	3.5	\$ 84,000	\$ 4,200	3
16	River Central Lookout Touch Point	400	A	\$ 120,000	\$ 6,000	3
17	Central Lookout Northern Link	5200	3	\$ 286,000	\$ 14,300	3
18	River Trail North	2300	1	\$ 103,500	\$ 5,175	4
19	Ginninderra Falls Rim Trail	3200	A	\$ 960,000	\$ 48,000	2/5
20	Ginninderra Falls to Discovery Centre	2100	4	\$ 136,500	\$ 6,825	2/4
		43000		\$ 3,199,000	\$ 159,950	

The estimated construction costs are derived from market rates per metre for commercially built natural surface trails. The rates are varied according to the construction rating (CR) which relates to the complexity of the trail. A much higher unit rate has been applied to the Ginninderra Falls Rim Trail and the Central Lookout Touch Point as these would ideally be constructed as accessible trails. If these two trails were not constructed to accessible standards then the total budget could be reduced by approximately \$1 million.

Ongoing maintenance is anticipated to be %5 of construction costs (19). TRC Tourism also estimate ongoing maintenance costs of "Lookouts" to be \$40,000 per annum and rest areas and Picnic Facilities at \$20,000. (19) An additional \$10,000 per annum should be included for Boardwalks and \$10,000 for rest areas.

8

Implementation

It is important to acknowledge that this trails master plan sets out the principles and aspirations for the provision of trails within the Murrumbidgee River Corridor. It is not a detailed design and there are several processes that will need to be undertaken prior to the construction of any trails.

The steps towards implementation are expected to include:

Consultation and acceptance - Consultation with stakeholders will inform the evolution of this plan towards a final outcome. As the details for the urban development at West Belconnen are resolved over time, this master plan may also need to be revisited and updated.

Agreement of staging - The trails have been allocated into 5 stages for delivery. It is likely that various stakeholders will advocate for different trails to be delivered first. While detailed design and planning approvals would be most efficiently sought over all the trails at the same time, it is possible that land ownership or other constraints may require a staging regime for approvals, as well as for intended construction sequencing.

Ground Truthing and Flagging - The trail alignments shown on the master plan represent a primarily desk-top study. While site visits have been undertaken the trail alignments have not been individually ground-truthed. Following general agreement on the master plan each trail will need to be walked to obtain an updated GPS trace and to leave temporary markers on the ground for subsequent trail alignment studies to be undertaken.

Ecological Walkover - The ecological values of the Reserve area have been studied and mapped previously but at a relatively broad scale. It is recommended that the marked trails be walked by an ecological consultant to make a detailed study of the trail corridors, make recommendations for alignment changes to avoid areas of higher value and to assess the level of impacts to inform the required planning and environmental approvals.

Heritage Survey - As with the ecological values, it is recommended that the marked trails be walked by a heritage consultant to ensure heritage values are being appropriately conserved. The scope for this heritage consultant should include recommendations on how to manage visitation to the sites of higher value, in particular the aboriginal rock shelter and scarred trees.

Refinement of alignments - Based upon the targeted heritage survey, ecological study, and the ground truthing that may identify barriers to trail building in some locations, the alignments of the proposed trails will need to be updated to create an updated master plan. The alignments may also need to be modified in areas close to the urban development as the design of the development will create many of the points of origin into the corridor.

EPBC Referral - The West Belconnen Project Strategic Assessment (12) addresses the management of matters of National Environmental Significance within both the urban development areas and the Reserve. The strategic assessment contemplates the need for works within the Reserve to provide for recreational, bushfire management and maintenance activities. The recreation and tourist facilities are described as including buildings, picnic areas, car parks, two access roads and numerous unsealed walking and cycling tracks. While each works package will need to be separately assessed to ensure consistency with the principles established in the strategic assessment, it would be reasonable to expect that the proposed trails will be covered by this assessment.

Approval under the Planning and Development Act 2007 - All of the Stage 1 trails are within the ACT and will need to be considered for approval under the Planning and Development Act. Depending upon the outcomes of the EPBC assessment and the status of the land at the time, the required planning approvals could range between the trails being deemed to be exempt public works through to impact track development to be accompanied by an EIS. It is recommended that a separate analysis be undertaken on the most efficient way to obtain planning approvals for all of the proposed works within the Reserve, including the trails.

Detailed Specification and Tender - In parallel with the approval of the trails the detailed specifications can be developed to allow the tendering for construction. The specification should rely upon the identified trail standards and use the agreed trail alignments from the master plan, however it should not be a fully detailed and engineered specification. The fine detail of the trail design should be left to the constructor so that the trail can be designed and built on the ground and micro-aligned around trees, rocks and other interesting features. In some areas the final trail alignment may need to be resolved under the supervision of an ecologist or heritage consultant.

Construction - After all of the above steps, it will be possible to commence trail construction. It would be highly desirable to have at least Stage 1 of the trails constructed before the first homes are occupied to ensure residents can form positive behaviour patterns (healthy and ecologically conscious) from the outset.

9

Conclusion

The West Belconnen Corridor Reserve adjacent to the West Belconnen urban development is being established to preserve the environmental values of the river corridor.

There is no doubt however, that the Reserve will be immensely popular with the local community and the broader population of Canberra. The Draft Management Plan recognises that the reserve will become a community and visitor destination with its natural, cultural and recreational resources managed for sustainable community enjoyment and enriching experiences.

In order to protect the environmental values a series of recreational trails are recommended to corral the visitors and to cater to their recreational needs and to provide links between the most desirable locations.

A secondary benefit of these trails will be the encouragement of active and healthy lifestyles of the community.

The majority of the trails are recommended to be narrow trails that minimise their footprint and provide a more desirable natural experience.

A total of 20 possible trail links are identified and depicted on the associated maps.

While some vehicular trails will need to be retained within the Reserve for maintenance and fire risk management purposes, the majority of redundant vehicular trails should be closed and rehabilitated.

10

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