



MASTER PLAN

Talbingo and Yarrangobilly Mountain Bike Trail Network



Delivery Partners

The master plan for the Talbingo and Yarrangobilly Mountain Bike Development was developed by the following delivery partners.



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Executive Summary

In the mountains surrounding the township of Talbingo, a green hue is returning to the landscape, grasses and groundcovers are slowly covering blackened earth and green shoots are bursting from blackened trees.

Birds and insects can also be heard where only months ago there was an eerie silence. Nature is working its magic and repairing the damage from the bushfires.

In the township of Talbingo, and in surrounding areas, the recovery from the bushfires is a lot less noticeable.

The Snowy Valley Region is heavily reliant on tourism activity to support local businesses and generate economic activity. Due to this heavy reliance, the bushfires as well as the COVID-19 pandemic has had a significant impact on the economy and retention of residents.

Indicative estimates of the impact of COVID-19 to the Snowy Valleys economy to 31 October 2020 has resulted in a decline of approximately 200 employees and GRP was estimated to decline by approximately \$21.6 million compared to 2018-19 estimates.

The impacts of the fires of the 2019/20 summer will take time to recover from. The impacts are not just in physical assets and economic losses. The residents of Talbingo are reminded of the challenges they have ahead everywhere they look.

To make sure this situation does not happen again, Snowy Valleys Council and the people and businesses of Talbingo recognise the need to diversify and build on their current attractions and economic drivers. The town realises that there is a need to add additional income streams in order to survive and prosper into the future.

While the concept for the Talbingo mountain bike trail development was conceived before the 2019/20 fires, the development of a mountain bike trail network in and around Talbingo has the potential to provide significant short and long term economic stimulus for the township.

The opportunity

The Snowy Valley Region currently records minimal mountain biking visitation by comparison to neighbouring regions.

The cycling market and travel cycling market is recording strong growth year on year. The cycling tourism market (visitors that have recorded cycling as an activity on their trip) has grown by 9.7% in New South Wales on average per annum over the past 10 years. Mountain biking is estimated to represent a large proportion of this.

Specifically, the e-bike market is poised for high growth of 6.2% on average per annum between 2020 and 2025 (globally). The rate of product development, investment, and consumer acceptance in Australia indicates that this market segment is on its way to becoming a mainstream category, as is the case in Europe.

Leveraging off the existing trails in the Snowy Valleys region, the development of mountain bike trails near Talbingo has the potential to become a significant attractor for mountain bike tourism to the region, providing new business opportunities and increasing the economic benefits to existing businesses.

At a regional level, the concept of including cycling into the future direction of the Kosciuszko National Park is not a new concept.

The Kosciuszko National Park Cycling Strategy released in 2017 highlights the social and economic benefits of increasing cycling opportunities within the park. The vision of the strategy is:

By 2025 Kosciuszko National Park will have made a positive contribution to the wider Snowy Mountains region, being recognised nationally for outstanding ecologically sustainable cycling experiences.

The National Parks and Wildlife Service (NPWS) Sustainable Mountain Biking Strategy 2011 provides a framework for the NPWS to develop mountain-biking experiences in parks. The vision for the strategy is to ensure that 'high quality mountain-biking experiences are provided in an ecologically and socially sustainable manner across the landscape'.

There are numerous examples of other areas across Australia that have embraced mountain biking to address social and economic issues. One of the best examples of this is Derby in Tasmania, while other examples include Bright and Warburton in Victoria.

Each of these towns recognised the benefits that mountain biking could provide to their communities and aggressively pursued trail developments to achieve their goals.

Capital costs

The projected capital cost associated with the development of the project is \$8.4 million.

For modelling purposes, it has been assumed that the construction phase will occur between 2020-21 and 2023-24, with early works and professional services in the first half of 2021, followed by a two-year construction program between 2021-22 and 2022-23.

Operating costs

Operating and maintenance costs associated with the project include employee costs, annual corridor pruning, machine rebuilding works, insurances, equipment, marketing and promotion, consultants, equipment and materials, maintenance, and replacement costs. Estimates of operating expenses have been developed based on the experience of other newly established mountain bike trails.

Operating expenses have been estimated at \$12,500 for 2021-22 and rising to \$63,000 for 2024-25.

Some initial management and maintenance costs are covered through the seed funding between 2021-22 and 2023-24. Operating expenses have been estimated to remain constant from 2024-25 onwards.

Depending on the overall trail usage and environmental conditions, some parts of the trail network will require rebuilding or major repair work to maintain the trail network in a safe and sustainable condition.

To allow for these works, an additional allowance of \$35,000 per annum over three years has been included in the operating costs for the project. Over the first 20 years of operations these rebuilding / major repair works are indicatively projected to occur every 5 to 10 years, and for modelling are assumed to occur between 2027-28 to 2029-30 and 2037-38 to 2039-40.

Economic impact analysis

The Cost Benefit Analysis identifies that the project is economically desirable under the 4%, 7% and 10% discount rates for all growth scenarios, returning a positive Net Present Value for all scenarios.

The Benefit Cost Ratio ranges between 2.51 (4% discount rate) and 1.79 (10% discount rate) under the baseline growth scenario, indicating that for each dollar cost the project will generate between \$1.79 and \$2.51 in benefits (i.e. benefits outweigh the costs).

Based on a capital cost of \$8.4 million, the Economic Impact Assessment identified that construction of the trail network will support approximately 21 FTE jobs, output of \$6.2 million, \$2.9 million in gross regional product, and wages and salaries of \$1.5 million (including direct and flow on activity).

The Economic Impact Assessment identified operations of the facility will support approximately 55 FTE jobs, output of \$11.8 million, \$6.3 million in gross regional product, and wages and salaries of \$3.3 million each year on average under the baseline growth scenario (including direct and flow on activity).

Financial viability

The financial analysis has identified that Council will be able to fund the project due to the 100% grant funding that is assumed will be available.

The level of modelled revenues escalating at 2.0% per annum will cover operational costs (excluding depreciation) in all scenarios, except in those years where machine re-building works are required to be undertaken.

From a cash flow perspective, the cumulative cash position under all scenarios is positive meaning that all operational costs (excluding depreciation) are covered by operating revenues.

While the project is cash flow positive, nearly \$400,000 in depreciation charges (including the trail formation depreciation) are associated with the capital expenditure, which results in a significant operating loss under all scenarios.

It should be noted that for the purposes of financial modelling the capital costs associated with the formation of the trail (excluding any built infrastructure) have been assumed to have a useful life of 20 years, to reflect the annual benefit of the trail to Council. This results in an annual depreciation charge of \$191,670 (including contingency) for trail formation.

This approach should be reviewed against Council's depreciation policy; due to the regular ongoing maintenance of the trail, including machine re-building works every five to ten years, a full replacement of the trail may not be necessary at the end of its useful life, therefore the full replacement cost may not be required to be funded by Council.

The impact on Council finances under all scenarios shows:

- The Operating Surplus Ratio is marginally worsened from 2021-22, when compared to the current Long-Term Financial Plan (LTFP).
- The Net Financial Liabilities Ratio is unchanged, remains negative and is well below the maximum target of +60.0%.

Trail governance

Appropriate trail governance arrangements are critical to ensure appropriate frameworks are implemented to manage and operate the trail network and associated infrastructure.

The approach taken to identify the best governance framework was to perform a critical review of the governance models allowable under the existing NSW legislative framework within which Council and the NPWS operate, and through benchmarking similar projects in Australia and New Zealand.

The land to be used for the Talbingo and Yarrangobilly trail precinct is wholly controlled by the NSW NPWS who are subject to the *National Parks and Wildlife Act 1974* and *National*

Parks and Wildlife Regulation 2019, which may fully or partially constrain their ability to implement or be party to any preferred governance model.

As the land is located within a National Park, it must remain in public ownership but can be leased or licensed for recreational and sporting purposes, subject to Ministerial approval, (*National Parks and Wildlife Act 1974 no 80, Part 12 S150 & S150A*).

Initially, a Sole Agency Public Operator (with Reference Group) governance model is the recommended option (e.g. Council managed and operated, supported by a community reference group that may include stakeholders such as the Talbingo Mountain Bike Club (Talbingo MTB Inc.), relevant local businesses/ community representatives and relevant NSW Government department(s), however, an appropriate way forward may be to transition to an Incorporated Body Operator within 3-5 years (e.g. managed and operated by an incorporated body such as the Talbingo Mountain Bike Club, on behalf of Council).

This transition period would allow time for the Reference Group members (such as Talbingo MTB Inc.) to develop and gain experience in managing the trail network and all parties to gain a better understanding of the:

- Operational revenues and costs of the operation
- Actual visitation growth and number of events
- Funding sources that may be accessible.

Without a final decision on a transition to an Incorporated Body Operator model, the financial analysis has been modelled based on the Sole Agency Operator only.

The trails

The proposed Talbingo and Yarrangobilly mountain bike trail network will be positioned along Old Mountain, Big Talbingo Mountain, and with connections to Yarrangobilly.

At the core of the Talbingo trail network will be a 15 kilometre long descending trail that connects the top of Old Talbingo Mountain to the township of Talbingo.

This trail drops descends 1,000 metres in elevation along its length, making the trail the longest continuous descent in Australia, and the only trail in Australia that incorporates 1,000 metres of vertical descent.

The proposed trail network has been divided into the following precincts:

1. **Talbingo Precinct** (51km of trail) – this precinct is designed as the hub of regional trail network. The Talbingo precinct includes the majority of the trail network and includes the primary descending trail experiences. The Talbingo precinct is the best understood element of the project and presents the best opportunity for expedited construction that will deliver early economic benefits to the region.
2. **Yarrangobilly Precinct** (30kms of trail) – this precinct is a logical trail network to compliment the Talbingo Precinct. NPWS have identified that Yarrangobilly is an underutilised area that would benefit from mountain bike trail linkages. The delivery of this precinct may require change to Plan of Management for the area.

The Talbingo and Yarrangobilly MTB Trail Network is anticipated to become one of Australia's most popular mountain biking trail networks, due to housing the longest vertical descent along single-track in the nation.

This will attract visitors from across the country and internationally, to experience the unique offering of the Talbingo and Yarrangobilly MTB Trail Network.

Trail construction

The construction phase for the project will occur between 2020-21 and 2023-24, with early works and professional services in the first half of 2021, followed by a two-year construction program between 2021-22 and 2022-23.

To optimise construction efforts, and to open trails for riders as soon as possible, the trail network will be constructed using multiple trail crews, working on different trail sections or in unison to build network.

The initial construction focus will be on the Talbingo Precinct and specifically the Old Mountain area which will provide the opportunity to open a trail network for riders while other sections of the network are built.

Works on Big Talbingo area would develop in parallel to the Old Mountain area, however the trails on Big Talbingo will need to be built in their entirety before opening as the remote nature of the trails does not allow sections of the trail to be progressively opened.

The Yarrangobilly precinct will be constructed following the completion of the trails on Old Mountain. There is potential to open the Yarrangobilly trail in sections as an 'out & back' ride as construction progresses from Talbingo towards Yarrangobilly.

Large platforms and bridges, as well as signage and trailhead infrastructure, will be designed and procured in the first year of construction to prevent long lead time items from delaying construction activities.

Minor raised platforms will require thorough planning (several months in advance) to coordinate material supply and delivery (via helicopter) to site, and to coincide with each trail section being constructed.

Bridges on the Yarrangobilly River would ideally begin construction early in second year of the project. Larger Platforms will be required at different stages throughout the project and construction will be timed to correspond with trail construction in that area.

Signage, in particular wayfinding signs, would be required in stages from as early as six months into project to allow trail sections to be progressively opened, with larger trail head signs and infrastructure required in final quarter of project.

Environmental considerations

The site for the proposed Talbingo mountain bike network is within Kosciuszko National Park which was reserved as a State Park in 1944.

The Kosciuszko National Park Plan of Management 2006 which incorporates the Snowy Management Plan and details the overarching principles of the management of the park with the need for an environmentally sensitive and sustainable approach to maintaining the natural and cultural values.

The proposed MTB network is consistent with the recreational values and environmental stewardship and more specifically *Section 8.11 of the plan of management and the Kosciuszko National Park Plan of Management: To allow consideration of sustainable mountain biking opportunities amendments that were released in 2014.*

The development and installation of the proposed MTB network will be undertaken in such a way to minimise the impact to nature, historic and aboriginal areas of cultural significance, or geo-heritage locations.

The development will enable members of the public to access areas of Kosciuszko National Park that are not currently readily accessible, providing greater opportunity for public appreciation and enjoyment of these areas of significance.

In addition, the proposed development will be constructed to minimise the impact to nature, flora, and fauna so it is unlikely that threatened species, populations, and ecological communities would be impacted but the MTB network.

Aboriginal cultural heritage considerations

At the time of publishing the draft master plan, formal project consultation has not occurred with the Local Aboriginal Land Council. Feedback will be incorporated following the consultation period which will occur between 14 December 2020 and 18 January 2021.

Initial discussions have occurred through Parks NSW with feedback that the Council were not going to provide project endorsement from their perspective until they took the notes and maps to the next Local Aboriginal Land Council meeting which is in the New Year.

The group are were also going to discuss it with the local Aboriginal community prior to commenting.

Some other points made if the project was to proceed that the local Aboriginal community:

- Continue to be consulted throughout the development of the plan
- Are made aware of any recommendations or findings coming out of the REF
- Are interested in any sites identification and survey work should it be required in the formulation of the REF.

The local Aboriginal community are interested in any opportunities there might be for involvement in construction and maintenance of the trail network if and when it eventuates

In summary

The Talbingo Township (and more broadly the Tumut Region and Snowy Valleys LGA) is heavily reliant on tourism activity to support local businesses and generate economic activity. The bushfires in late 2019 and early 2020, along with the COVID-19 pandemic has had a significant impact on tourist visitation to the area, with flow on effects to the local economy.

There is a pressing need to explore new tourism opportunities in the Tumut region, with mountain biking identified as a key prospect.

The development of the Talbingo and Yarrangobilly mountain bike trail network provides a catalytic opportunity that will provide both locals and visitors with access to high quality outdoor and adventure experiences at Talbingo, and in the broader region. The Project will significantly enhance the region as an adventure tourism destination by adding to the existing range of outdoor pursuits on offer.

The Project will also provide much needed social and economic stimulus to the Snowy Mountains region through increased infrastructure investment, and through tourism and supply chain industries such as accommodation and food services.

Based on the outcomes of our investigation, the Project is viable from an economic, social, and environmental basis and will significantly diversify the tourism opportunities for Talbingo, and for the broader Tumut region.

The Talbingo and Yarrangobilly mountain bike trail project is 'shovel ready', with construction able to commence in 2021 and be completed by 2023. Project staging will see the first trails open to riders in late 2021.

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Image Hut at Yarrangobilly Village (Natural Trails)

1. Background

1.1. Talbingo

Talbingo is a small township located in the Snowy mountains. The town is known as the Gateway to the Snowy Mountains and Kosciuszko National Park.

Talbingo has approximately 300 permanent residents who mainly work for Snowy Valley Hydro or who support the increasing flow of visitors who visit the town throughout the year.

The township of Talbingo is made up of around 400 houses with around 75% of these used as holiday houses. This underlying capacity to accommodate tourist to the area makes Talbingo attractive as a hub for tourism.

Talbingo is surrounded by National Park and provides easy access to the Talbingo and Blowering Reservoirs for water sport activities and the Selwyn Snowfields for winter sports.

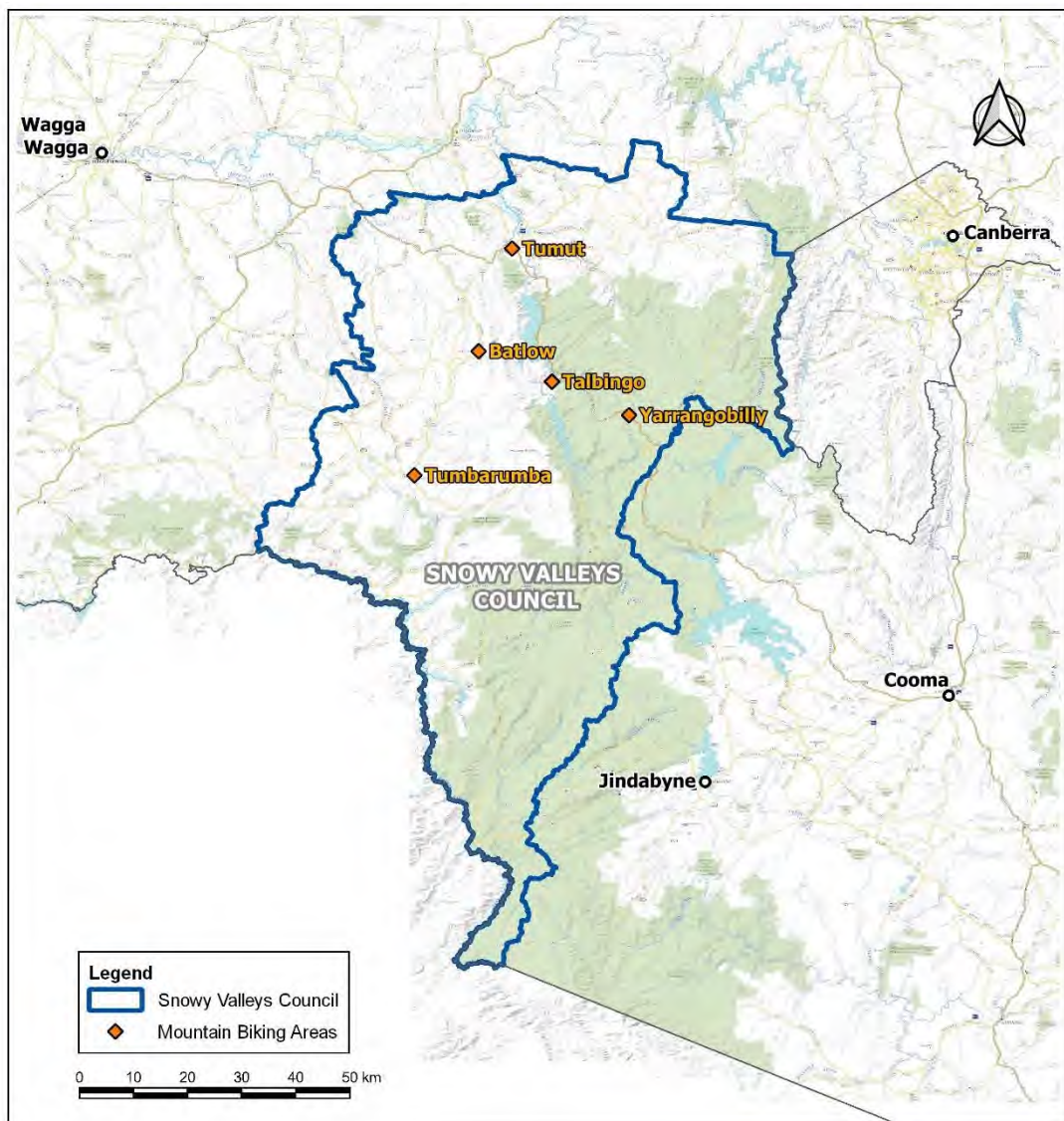


Figure 1.1. Snowy Valleys Region map

1.2. The regional perspective

Talbingo is located in a region that is blessed with abundant natural areas and recreational opportunities for people to enjoy.

Local business owners, Snowy Valleys Council and the NSW Government recognise the opportunities available in the Talbingo region to significantly improve the regional economy through the development of tourism infrastructure projects.

This Master Plan has been developed to align with and supplement the following regional strategies and plans:

- Destination Riverina Murray Strategic Plan 2019-2020
- Hume & Hovell Track Mountain Bike Master Plan (Snowy Valleys Council)
- Destination Management Plan (Destination Riverina Murray)
- Snowy Valley Council Economic Development Strategy
- Snowy Valley Council Destination Management Plan.

In addition, the Master Plan specifically supports the Kosciusko National Park Cycling Strategy by delivering the following:

- Provides high-quality single-track experiences and establishes great rides in the north of Kosciusko National Park
- Expands on the promotion of the Big Talbingo Ride as an off-road cycling experience by incorporating single track into the trail
- Meets the objective for the development of cycling opportunities in and around the Yarrangobilly precinct
- Encourages the development of e-bike opportunities
- Recognises full range of opportunities can only be delivered in partnership with other stakeholder groups (funding, governance, maintenance, etc.)
- Reinforces that current management trails primarily provide a fitness experience rather than an immersive, skills based experience, this reinforces the promotion of the management trails for longer backcountry style rides for e-bikes.

1.3. What brought us to this point

In late 2019, Talbingo MTB Club engaged Natural Trails to develop a Concept Plan to provide a high level outline of the scope of work for the Talbingo Trail Development Project, a cost estimate to deliver the scope of work and options to expand the scope to include regional trail linkages. The plan was submitted to the Talbingo MTB Club and to Snowy Valleys Council in March 2020.

The Concept Plan was developed with the support of key regional stakeholders including:

- NPWS
- DNSW – Riverina Murray
- SVC
- Talbingo MTB

- Tumut MTB Club.

The primary purpose of the Concept Plan was to secure the following:

- Gain buy-in and approval from the major landowners involved in the project, NPWS, NSW State Forests and Snowy Hydro
- Educate stakeholders and government agencies on the opportunities associated with the development of mountain bike infrastructure at Talbingo and in the Snowy Valley region
- Engage local business owners and clubs to identify and promote opportunities associated with mountain bike development in the region
- Secure funding to develop a master plan and business case for the project
- Secure funding to deliver the project
- Establish governance arrangements for the ongoing management and maintenance of the trail network and associated facilities.



Image looking south towards Talbingo and Big Talbingo Mountain (Natural Trails)

2. The opportunity

2.1. Proximity of mountains to Talbingo

The township of Talbingo is located in a valley surrounded by mountains. Mountains are a key ingredient in great mountain bike trails and great mountain bike experiences.

The top of Big Talbingo Mountain is 1,000 vertical metres above the Talbingo township.

The development of a mountain bike trail from the top of Big Talbingo Mountain to the Talbingo township would make this the only trail network in Australia with 1,000m of elevation loss over its length. This elevation will also provide a continuous 15km descending trail, the longest descending trail in Australia.

The close proximity of the Talbingo township to the trail network is also a significant benefit, the trails are easily accessible using existing bike paths.

2.2. Proximity of Talbingo to significant regional centres

Talbingo is located within a region with high tourist visitation. Jindabyne to the south and Canberra to the east are both recognised as mountain bike tourism destinations.

Tumbarumba to the south west of Talbingo is also an emerging cycling hub for the region.

Leveraging off these areas, the Talbingo mountain bike trail development has the potential to become a significant attractor for mountain bike tourist to the region, providing additional business opportunities and increasing the economic benefits to existing businesses.

2.3. Adventure tourism synergies

The Talbingo mountain bike trail network will cater to all skill levels and will provide both residents and tourists with improved outdoor recreation opportunities.

The Talbingo trail network will complement existing summer activities and will also provide an additional economic opportunity for tourism during winter months.

These factors combine to meet the vision contained in the NPWS Sustainable Mountain Biking Strategy 2011.

By 2025 Kosciuszko National Park will have made a positive contribution to the wider Snowy Mountains region, being recognised nationally for outstanding ecologically sustainable cycling experiences.

2.4. Bushfire recovery

Talbingo has been identified by Destination Riverina Murray and Snowy Valleys Council as the prime area for development to aid the region following the 2020 bushfires.

The mountains around the township have been heavily impacted by fires, which will have both short and long term consequences for the local economy.

The Talbingo township has already been directly impacted by the fires, as the Talbingo and Blowering Dams were closed during the peak tourism season for water sports. This greatly impacted on tourist visitation and spend in the township.

Moving into the winter season, the total loss of the Selwyn Ski Resort to the bushfires and its closure for the 2020 snow season has had a significant impact on accommodation and associated businesses in the region.

The development of a trail network at Talbingo will help boost visitation numbers to the region year round as the trail network is below the snow line. In addition, the construction effort will rely on local labour and materials, injecting much needed funds into the township.



Image from the Snowy Valley Highway (Natural Trails)

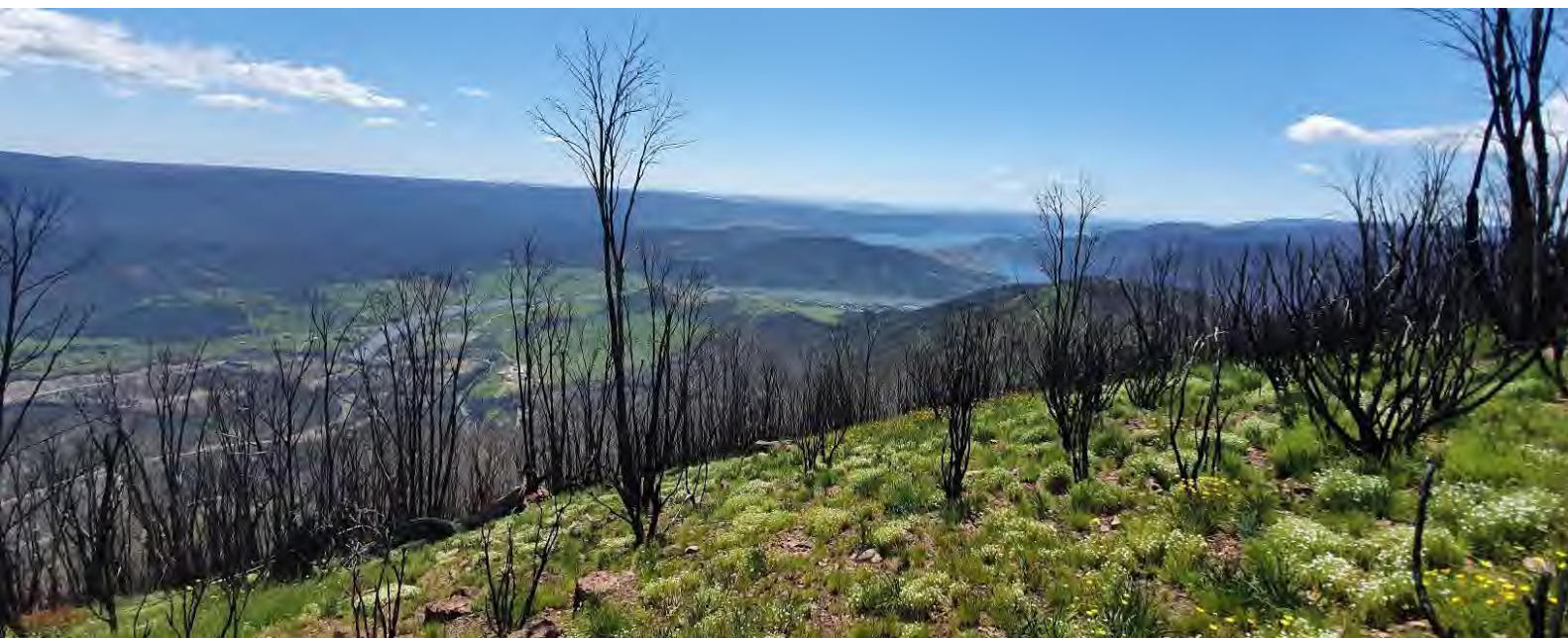


Image from Big Talbingo looking north to the Talbingo township (Natural Trails)

3. The Talbingo trail network

3.1. Trail overview

In total the Talbingo / Yarrangobilly trail network encompasses around 86 km of single track with an additional 15 km of linkages provided by existing fire trails and management tracks.

The trail network is being designed with a focus on the e-bike market however the trails will also be suitable for conventional mountain bikes.

The trail alignments have been established using principles from the Australian Trail building Guidelines (MTBA 2019) to meet a “blue - intermediate” trail rating.

Trail alignments have been identified that use the natural topography and contours of the terrain to provide the best rider experience possible, to manage rider speed, avoid excessive braking and to optimise the long term sustainability of the trail network.

For the purpose of this master plan, trail developments have been separated into the following precincts:

- Talbingo Trail Network – trails and associated infrastructure that provide a central ‘hub’ to the trail project, as well as creating a unique and exceptional product in its own right
- Yarrangobilly Trail Network – Trails and associated infrastructure to provide a connection between the Talbingo trails and the Yarrangobilly Caves precinct.

Details of each trail network are outlined in the following sections.

3.2. Talbingo precinct trail network

The Talbingo Precinct Trail network is composed of the following elements:

- 6km of trail that links the township to the Tumut 3 Power Station to the north of the township, this trail will run parallel to the existing access road and will provide a family friendly riding experience close to the township.
- 3km of existing trail that links the township to the Old Mountain Trail Network to the south of the township, this trail will provide the key linkage for riders who will be climbing the trails on Old Mountain while also providing an additional family friendly riding experience close to the township.
- A 6km climbing trail from the end of the Township Trail to the top of the Old Mountain Trail, this trail is designed to allow riders to choose how far they want to ride by allowing them to connect into the Old Mountain Trail at various locations.
- A 6km climbing trail from the top of Old Mountain Trail to a shuttle point located near where Cumberland management Trail meets the Snowy Mountains Highway.
- 15km of descending trails that starts at a shuttle point located on the Snowy Mountains Highway and descends back to the Township Trail.
- 10km of new dual direction link trail and sections of existing Cumberland Trail that connects the shuttle point on the Snowy Mountains highway to the top of Big Talbingo Mountain.

- A 15km trail that descends from the top of Big Talbingo Mountain to the Talbingo township.
- Potential road underpasses to allow riders to cross Snowy Valley Highway safely at crossing points one and three.
- A shuttle point and carpark on the Snowy Mountains Highway.
- A pump track, skills area, clubhouse, and maintenance shed.

Maps and associated trail profiles for the Talbingo Precinct Trail Network are included in Appendix B.

3.3. Yarrangobilly precinct trail network

The Yarrangobilly Trail Network is composed of the following elements:

- A 22km dual direction trail from the eastern end of the Talbingo Trail Network to Yarrangobilly via Landers Falls, this trail is designed to allow riders to link between Talbingo and the Yarrangobilly River Trail. It will utilise large sections of existing management trail with new sections of singletrack where required (primarily realignment of Lander's Fall trail to be sustainable for bike use)
- A 15km dual direction trail that starts at Yarrangobilly located on the Snowy Mountains Highway and descends along the southern side of Yarrangobilly River to the caves precinct, then via a new bridge over the river to the thermal Pool, and then on the existing management trail to connect to Caves House.
- A shuttle point at the existing carpark on the Snowy Mountains Highway at Yarrangobilly Village and a bridge over river to connect to trail.

Maps and associated trail profiles for the Yarrangobilly Trail Network are included in Appendix C.



Image from Big Talbingo looking southeast (TouchPoint One)

4. Market analysis

4.1. Overview

A critical outcome of the Master Plan and economic analysis is to confirm demand scenarios related to the Talbingo and Yarrangobilly Mountain Bike Trail Network.

Underlying demand for the project has been identified through analysis of data and literature to understand the current tourism activity, key factors influencing demand for mountain biking, current and future trends, emerging opportunities, and an assessment of how relevant case study areas perform.

This information has been used to estimate future demand for the proposed mountain bike trail networks. Refer to Appendix D – Talbingo Economic and Financial Analysis for additional information.

When deciding where to ride, key factors mountain bikers typically consider include:

- Trail Quality (trail style / difficulty / upkeep/ maintenance, on-site services, features, etc.)
- Volume and variety of trail
- Trail linkages that make sense and provide a logical trail network to ride
- Shuttle options, chairlifts, helicopter lifts, etc. to increase the descending opportunities
- Parking and access to the trails
- Environmental quality (including view, points of interest, forest types)
- Climate and the time of year when trails are enjoyable to ride
- Accommodation (a variety of options from camping to 5-star, mountain bike storage, social areas, ease of access to trails)
- Food and beverage options (variety and location, coffee to start the ride – beer to finish the ride)
- Non-riding activities (pampering experiences (spas, massage, etc.) access to facilities, variety of activities, adventurous activities to supplement riding)
- Events, both ride specific and other events that can form part of a holiday or weekend away.

These factors have been used to assess mountain biking opportunities in Talbingo and the Snowy Valleys region.

4.2. Current trail networks

Talbingo is located on the western edge of North Kosciuszko National Park, providing significant opportunities to act as a base or hub for MTB tourism activity.

Currently, the majority of the trails in the vicinity of Talbingo are located in North Kosciuszko National Park, which houses over 200 kilometres of trails (including both fire trails and single track) and over 1,700 meters in elevation (Trailforks, 2020).

There are various entrances to the existing trail networks, with the closest positioned along the Snowy Mountains Highway. Lookouts are positioned along the trails, as well as camping sites which are positioned both along the trails and at the entrances.

In addition to the trails in North Kosciuszko National Park, the Snowy Valleys region has hundreds of kilometres of trails across the various regions.

Trails other than those identified around Talbingo include:

- Tumut – Over 10 kilometres of trails with up to 500 metres in elevation and one carpark entrance.
- Tumbarumba – Over 20 kilometres of trails with up to 800 metres in elevation and multiple carpark entrances to the various sites (Trailforks, 2020).

Development of the Talbingo Trail Network would supplement these existing trails in the region (i.e. riders will travel to Talbingo for the Talbingo Trail Network and also ride existing trails in Tumut and Tumbarumba).

This is evident in Jindabyne, where riders travel and stay in Jindabyne for daily riding at the Thredbo Mountain Bike Park, however, will ride trails in Jindabyne in their spare time or on their way there or home from work, etc.

These opportunities will further enhance the attractiveness of the Talbingo region for mountain biking tourism purposes.

4.3. Current supporting businesses

There are currently limited businesses that support mountain biking in Talbingo.

Existing business in the area will have a significant opportunity to capitalise on the increased mountain biking related tourism and will also need to be sufficient to support demand from this influx and further enhance the attraction of the region.

The key business types that will be enhanced include bike sales, hire and maintenance businesses, food and beverage services, accommodation, and complementary activities/ services including the golf club.

4.3.1. Bike stores

Bike stores located within close proximity to the trails provide local and tourist riders with their daily needs, including spare parts, accessories, servicing/ maintenance/ repairs, hiring services, etc.

There are currently no fully operational bike stores located in Talbingo. One sports and ski hire business carries minimal spares and several hire bikes however the business is generally only open weekends or peak periods.

Tumut and Tumbarumba are the two main locations for MTB riding (other than Talbingo) in the Snowy Valleys region. Tumut currently has two stores, where riders can purchase bikes/ accessories/ parts, hire bikes, or have maintenance undertaken on their bikes. Tumbarumba has one store, where bikes can be hired and basic spare parts purchased (Google Maps, 2020).

There is an opportunity for additional bike stores offering a wider variety of products, servicing/ maintenance/ repair services, and bike hire/ tours in Talbingo and surrounds.

4.3.2. Food and beverage

Quality food and beverage offerings delivered by the private sector is essential for attracting riders, generating yield, and ensuring visitors return.

The food and beverage offering of the region needs to be continuously developed to meet the MTB tourism market needs and expectations.

As a small town, Talbingo currently provides limited food and beverage options for travellers. Options include a supermarket / cafe, and a country club / Chinese restaurant (Google Maps, 2020).

More broadly, the Snowy Valleys is known for its wine, beer and spirit, fruit and produce offering. The Snowy Valleys Destination Management Plan (2018) identified the need for the Snowy Valleys to deliver an improved food and beverage experience, leveraging this local produce.

There is an opportunity to increase the number of food and beverage services in and around Talbingo, and for these businesses to cater to the MTB tourism market, offering nutritious/ energy boosting meals, storage for bikes whilst visiting (i.e. bike racks), and located within proximity to accommodation and the trails

4.3.3. Accommodation*

The accommodation offering of Talbingo and surrounds will play an important role in attracting, supporting, and sustaining continued visitation to the region for mountain biking purposes.

Talbingo provides a variety of accommodation types, due to its long-standing position as a provider of water and winter sport tourism. Accommodation options include various camping grounds, a caravan park, mountain retreat, and seven other cottages/ apartments.

Bedspaces provided by these accommodation options in Talbingo are estimated to total approximately 340 (including that provided by camping/ caravan parks). This does not include rental houses/ properties, including those operated by AirBnB and other real estate agencies.

A significant proportion (70%) of the dwelling stock in Talbingo is used as holiday houses and temporary accommodation for visitors to the region, equating to approximately 196 dwellings available. Several dwellings are currently utilised as short term rentals for transient Snowy Hydro 2.0 contractors. Additionally, Airbnb provides 8 entire homes in Talbingo, available for 40% of the year with an occupancy rate of 51% (Snowy Valleys Council, 2018).

Audits conducted for the Destination Management Plan (2018) and Riverina Murray Accommodation Market Assessment (2019) identified between 70 to 80 accommodation providers within the key townships of the Snowy Valleys, including 672 guest rooms with a total capacity of approximately 2,986 bedspaces across the region.

Projected visitor nights indicate potential demand for an additional 16,000 visitor nights for the region over the next 10 years (not including consideration of the Talbingo Trail Network development), which would require between an additional 20 (low growth) to 180 guest rooms (high growth) to service this demand (Urban Enterprise, 2019).

Standard hotel/ motor inns are the largest accommodation choice for visitors across the region, comprising 45% of visitation, followed by caravan parks (31.0%), and

luxury hotels or resorts (6.8%) (Urban Enterprise, 2019). Gaps exist in the Snowy Valleys in relation to 4-star self-contained apartments, eco-lodges, boutique hotels, and glamping opportunities (Destination Riverina Murray, 2019).

Tumut has the largest concentration of accommodation (41% of bedspaces), followed by Khancoban (15%), Batlow (13%), Tumberumba (13%), Talbingo (11%), and Adelong (7%) (Snowy Valleys Council, 2018).

Similar to Talbingo, the broader Snowy Valley region also has a large proportion of dwelling stock (totalling 6,430) operated as holiday houses and temporary accommodation through real estate agencies. Additionally, AirBnB is also a major accommodation provider in the region. Airbnb recorded 71 active rentals in the Snowy Valleys region in 2019 with an occupancy rate of 38%; the majority are located in Adelong, Little River, and Talbingo (Urban Enterprise, 2019).

There is an opportunity to increase the accommodation offering in Talbingo and surrounds to support the potential increased demand from mountain bike riders in the coming years, including in the form of camping grounds, backpacking accommodation, boutique experiential accommodation, Airbnb, and motels.

All options should be able to support the requirements of the MTB tourism market, including the provision of bike storage, bike washes, etc.

* This information was published pre-bushfire. Accommodation availability has changed slightly since, and therefore, the below information likely overestimates the current accommodation offering and the supply-demand gaps may be more pronounced.

4.3.4. Complimentary activities

Complimentary activities and services will play an important role in encouraging a longer length of stay and providing MTB riders with opportunities for their 'down days' and for family members who do not ride to enjoy local attractions.

Due to its location on the edge of Kosciuszko National Park and between Blowering Dam to the north and Talbingo Dam to the south, there are many nature-based activities on offer in Talbingo and the broader Snowy Valleys region.

This includes hiking/ bushwalking, mountain biking, rail trails, fishing, horse riding, water sports, Yarrangobilly Caves, 4WD, and daytrips to other towns.

Talbingo is home to the Scheme's largest power station, Tumut 3. Travelers can take a scenic drive through town to the station, where there is interpretive signage, BBQ facilities and amenities (JindyInn, 2020). From here, travellers can drive north to visit the Jounama Small Hydro Power Station and Blowering Power Station, or south to visit the Tumut 1 and 2 UG Power Station and others. Various operators provide guided tours of the Scheme, including 'Gang Gang Australia Tours'.

There are a range of visitor centres providing information for visitors on the history and culture of the region, including the Tumut Region Visitor Centre, Tumberumba Visitor Centre, Yarrangobilly Caves Visitor Centre, and the Khancoban Visitor Centre.

These visitor centres provide opportunities for visitors to experience the local history and culture through tours such as the Wiradjuri Aboriginal Cultural Tour (Visit Snowy Valleys, 2020).

4.4. Accessibility

Talbingo and the Snowy Mountains can be accessed in a variety of ways:

- Driving from location of origin through the only access road in and out of Talbingo – the Snowy Mountains Highway.
- Flying into Canberra or Melbourne airports, and driving for between 2.5 and 3 hours and between 6 and 8 hours, respectively.
- Flying into the airstrip located at Talbingo.

There are currently no shuttle options available from Canberra to Talbingo. Since the establishment of Derby in Tasmania, shuttle service businesses have been established to transport riders from Launceston to Derby.

4.5. Known future supply

4.5.1. Future trails

Various MTB projects have been suggested in the Snowy Valleys Destination Management Plan (2018). These include:

- **Hume and Hovell MTB Track and Adventure Trail:** This project will build on the existing 426-kilometre Hume and Hovell walking track to allow it to be utilised for mountain biking purposes. The idea is for the trail to be utilised as both a series of separate day rides, or a 3-day MTB adventure combining on-track camping or shuttles to and from accommodation services. The masterplan has been developed; however, funding has not yet been sought.
- **Tumut MTB Park:** This project will allow the expansion of the existing mountain biking park, conditional of agreement from adjoining public landowners. A masterplan has not yet been undertaken.

Rather than acting as competitors to the Talbingo and Yarrangobilly MTB trails, it is likely these projects will further enhance the attractiveness of the region to MTB riders, offering a greater variety of trails to experience.

4.5.2. Food, beverage, accommodation, and complementary activities

The Snowy Valleys Destination Management Plan (2018) also revealed a series of accommodation, food and beverage, and complementary activities projects that will aid the ability of the region to support increased tourism; several of these initiatives are complete while others are in the planning or early stages of development.

Specific projects include:

- Riverfront activation masterplan for Tumut
- Brindabella Road upgrade and development of new touring route (access road from Canberra)
- Snowy Valleys Way touring route reinvigoration (new route focusing on exit via Albury/ Wodonga) – this project is complete
- Contemporary redevelopment of existing caravan parks – this project is currently being delivered
- Adelong main street activation
- Snowy Hydro 2.0 Educational Experience

- Brungle and Snowy Valleys Indigenous Attractions
- Blowering Dam Destination Accommodation and Café
- Cidery Experience, Batlow
- Rail trail investment including:
 - Tumut to Batlow Rail Trail
 - Tumbarumba to Batlow Rail Trail Link
- Tumbarumba wineries
- Tumut River Brewery Destination Development
- Sporting infrastructure upgrades.

Events were also acknowledged as key for attracting visitors to the region. The Snowy Valleys Destination Management Plan indicated potential for new events, such as a road cycling event in Tumbarumba, a mountain biking event in Tumut and Tumbarumba, a Four Seasons in the Snowy's food trail event, a food events calendar, and a heritage and culture events calendar (Snowy Valleys Council, 2018).



Image from near Landers Falls looking west to Talbingo Reservoir (Natural Trails)

4.6. Trends and influencing factors

4.6.1. Participation

Whilst there is limited research quantifying the MTB market itself, many studies have been carried out on the broader ‘cycling’ market, which comprises MTB activity as well as other forms.

The nationwide AusPlay survey (2019) indicated that there is a total of approximately 2.3 million cyclists in Australia, of which approximately 626,200 cyclists reside in New South Wales. These cycling estimates refer only to people aged 15 years and over. Studies suggest that mountain biking represents approximately 45% of this, equating to approximately 1.04 million MTB riders in Australia and 281,800 in New South Wales (TRC, 2013).

In terms of the MTB tourism market, national, and international tourism surveys only provide data on general cycling visitation and do not distinguish mountain biking from other forms of cycling. Various sources suggest that mountain biking comprises between 20% to 50% of all cycling tourism activity (TRC Tourism, 2019; TRC Tourism, 2013).

Tourism Research Australia (2020) indicates that the cycling tourism market (visitors that have recorded cycling as an activity on their trip) reached approximately 1.3 million in 2019, of which 29.1% represents those residing in New South Wales. Based on 20% to 50% representing MTB visitors, there were approximately between 268,000 and 670,700 MTB visitors throughout New South Wales in 2019.

Analysis of case study areas, both nationally and internationally, provides an indication of the overall visitation similar trail networks record (see Table 4.1).

Table 4.1. Annual Mountain Biking Visitation by Trail Network

Trail Network	MTB Visitors Recorded Annually	Trail Network Size (km)
National		
Blue Derby (Tasmania)	30,000 (anticipated to grow to 50,000)	80.0
You Yangs (Victoria)	150,000	50.0
International		
Makara Peak MTB Park (Wellington, New Zealand)	80,000	40.0 plus
Blue Park Wales (Wales, United Kingdom)	60,000	29.5
Rotorua (North Island, New Zealand)	250,000	120.0 plus
Whistler Mountain Bike Park (Canada)	200,000	Over 560.0

Source: Blue Derby (2020), Dirt Art (2018), Thredbo (2020), 30km - Mount Buller (2019), You Yangs (2020), Trailforks (2020).

4.6.2. MTB market growth

Growth in the MTB market is driven by the growing demand for sports and adventure activities. This is occurring as a result of junior participation programs, rising disposable incomes, improving living standards, growth of e-commerce platforms promoting sports, road riding becoming inherently more dangerous, initiatives from government and the private sector, and increasing health awareness.

As estimated in section **Error! Reference source not found.**, there are approximately 1.04 million MTB riders in Australia and approximately 281,800 in New South Wales (TRC, 2013).

AusCycling (previously Mountain Bike Australia (MTBA)) is the peak body for mountain biking in Australia, providing services, promoting the sport, and providing a safe and fair environment for competitions. It is beneficial for mountain bikers to become a member of this body, and therefore, membership can be an indicator of growth in the industry.

As of December 2019, the MTBA database exceeds 70,000 individual members, with growth of over 59% in the past five years. This is an indication of strong growth of the MTB market in recent years, which will likely continue.

In line with the significant growth of the MTB market, MTB tourism related activity is also growing. Whilst data limitations make it difficult to estimate the growth of the MTB industry, it has been assumed to trend in line with overall cycling tourism (though representing a smaller share).

Tourism Research Australia (2020) indicates that the cycling tourism market (visitors that have recorded cycling as an activity on their trip) has grown by 9.9% nationally on average per annum over the past 10 years, whilst cycling visitors to New South Wales has grown by 9.7% on average per annum.

As regions throughout Australia continue to record high growth in mountain biking participation and visitation, these regions also record significant growth in trail development. Since 2013, the following destinations have recorded significant investment in trail development due to growth in the industry:

- North Eastern Tasmania (Derby and Blue Tier)
- Mount Buller and Falls Creek in North East Victoria
- East Gippsland
- The Ottways in South Western Victoria
- Canberra
- Multiple destinations in New Zealand (TRC Tourism, 2018).



Image construction of a bridge on the Thredbo Valley Trail (Natural Trails)

5. Demand projections

5.1. Local market projections

Local demand for MTB trails is driven by the size and growth potential of the population and share of the population participating in the sport.

The local market has been assumed to comprise residents within the Tumut Region and Tumut Statistical Area 2 (SA2).

Due to the limited availability of data/ information for the Talbingo Township, the remainder of the report refers to the Talbingo Township in the context of the aggregate of the Tumut Region Statistical Area 2 (SA2), in which the Talbingo Township is located, and the Tumut SA2. The aggregate of these two areas is hereafter referred to as the Tumut Region. The Tumut Region captures the area surrounding the township of Talbingo, whereby riders can access the Talbingo and Yarrangobilly MTB Trail Network within an hour of driving

5.1.1. Population

Historically, the Tumut Region’s population has declined by 0.4% per annum on average between 2001 and 2019, to reach a population of approximately 5,600 people.

During summer, the region is bustling with tourists generating economic and business activity, however, it struggles to retain residents and maintain this activity throughout the year.

Population projections suggest the resident population in the Tumut Region will continue to decline by 1.0% on average per annum to reach a population of approximately 4,500 people by 2041 (a 1,000 person decline since 2019).

The broader Snowy Valleys region is anticipated to experience a similar trend, declining from a population of approximately 14,400 people in 2019 to approximately 12,000 by 2041 (a 2,400 person decline since 2019).

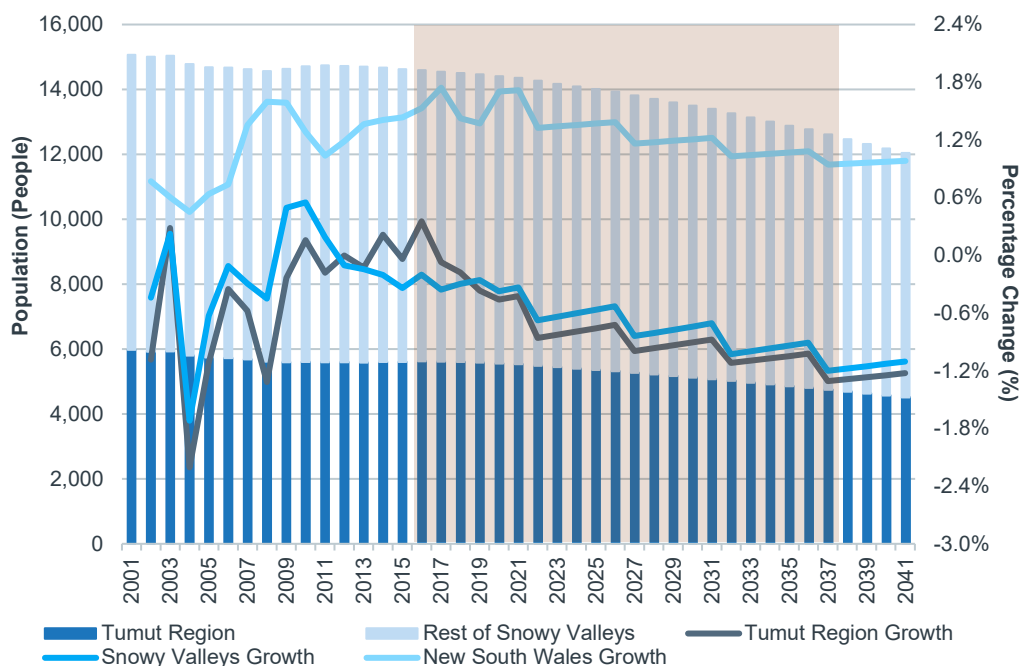


Figure 5.1. Historic and projected population, 2001 to 2041

Source: ABS (2020), Transport for NSW (2016), Department of Planning, Industry, and Environment (2016).
Notes: The shaded area is representative of the projected population.

The project is anticipated to assist Talbingo and the broader region with retention of residents, as there will be more business activity, employment opportunities, and recreational activities.

This has been evident in the town of Derby, where development of a trail network (opened in 2015) now brings an additional \$30.0 million to the economy each year through induced visitor spend on local businesses, and also caused a property market boom with prices rising by more than 60% since 2015 in neighbouring towns (The Examiner, 2018).

5.1.2. Local demand

The Project has the potential to increase the uptake of mountain biking as a sport for locals.

Currently, New South Wales records approximately 35.3 MTB riders for every 1,000 people in the population, whilst Australia records approximately 41.8 MTB riders for every 1,000 people (ABS,2020; TRC, 2013, Clearing House for Sport, 2019).

This indicates that New South Wales has significant potential for growth in terms of the local take-up rates of the sport. Assessment of other States, including the Australian Capital Territory (65.4 MTB riders per 1,000 people), further demonstrated the potential growth of the sport for New South Wales, and hence the Tumut Region.

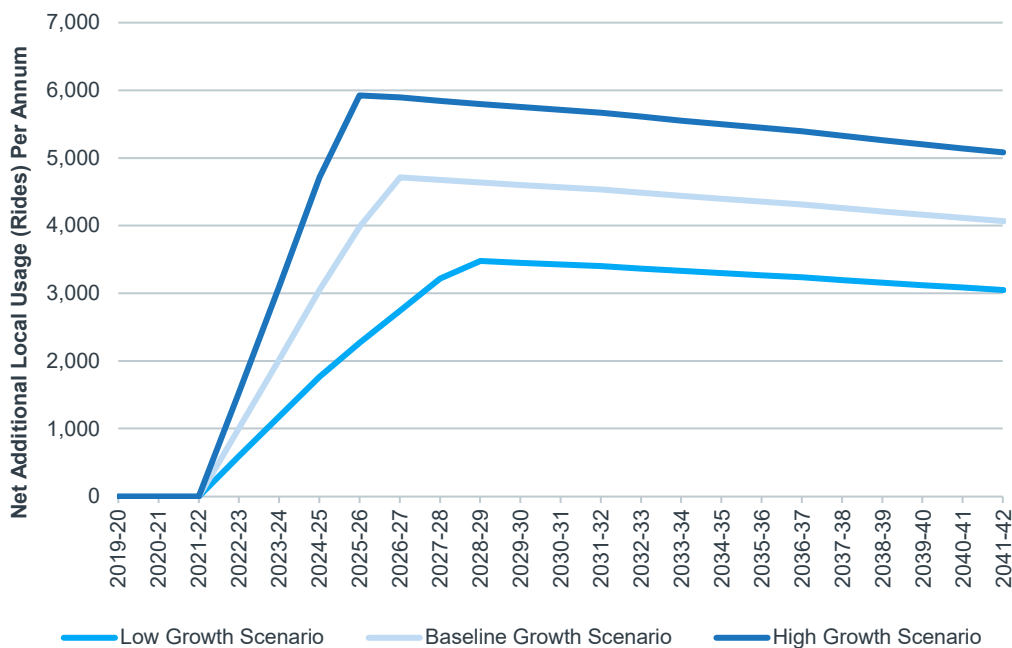
Based on mountain biking participation rates at the state level across Australia as well as MTBA membership growth rates in recent years, three scenarios have been assessed in terms of local take-up rates for mountain biking in the Tumut Region.

For these scenarios, given the uncertainty with regards to existing participation in the local community, different starting points in terms of existing participation have been applied as well as different growth rates:

- **Low Growth Scenario:** In 2021-22 there are assumed to be 30.0 MTB riders per 1,000 people in the population. This has been assumed to grow by 4.6% per annum on average from the first year of operations (2022-23) to reach, and stabilise at, 37.5 MTB riders per 1,000 people in the population by 2028-29.
- **Baseline Growth Scenario:** In 2021-22, there are assumed to be 40.0 MTB riders per 1,000 people in the population. This has been assumed to grow by 5.7% per annum on average from the first year of operations (2022-23) to reach, and stabilise at, 50.0 MTB riders per 1,000 people in the population by 2026-27.
- **High Growth Scenario:** In 2021-22, there are assumed to be 50.0 MTB riders per 1,000 people in the population. This has been assumed to grow by 6.9% per annum on average from the first year of operations (2022-23) to reach, and stabilise at, 62.5 MTB riders per 1,000 people in the population by 2025-26.

As outlined in the Economic and Financial Analysis, it has been assumed that local MTB riders undertake two rides per week on average, equating to approximately 130 rides per annum.

The estimated net additional local usage (rides) in the Tumut Region due to the project is presented in Figure 5.2.



Source: (ABS (2020), TRC (2013), Clearing House for Sport (2019)).
 Figure 5.2. Net additional local MTB usage per annum, Tumut Region

5.2. Visitor demand scenarios

Minimal mountain biking visitation is currently recorded in the Tumut Region. The Project has the potential to increase visitation through encouraging greater participation in MTB activities for visitors that typically come to the region, as well as attracting new visitation to the region.

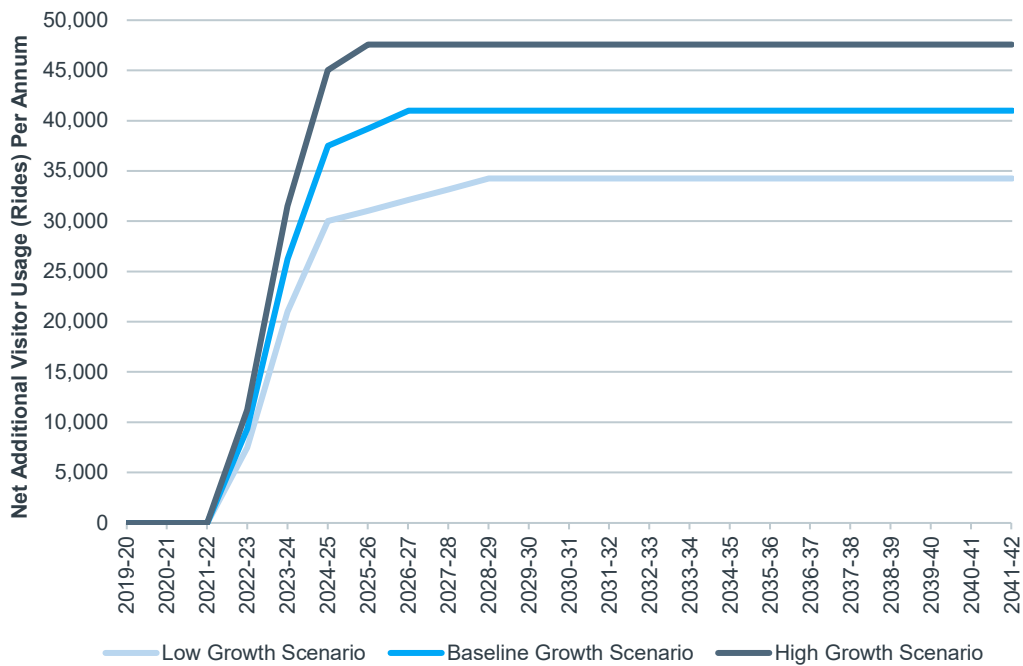
Case study analysis indicated that it is reasonable for the Project to result in increased cycling visitation of between approximately 15,000 and 25,000 visitors. It has been assumed that 75% of this related to MTB activities. This has been modelled under three scenarios for the **project case**:

- Low Growth Scenario:** 15,000 additional MTB visitors per annum by year three of operations, with 25% achieved in 2022-23, increasing to 70% in 2023-24 and 100% in 2024-25. MTB visitation is then expected to trend 25% below projected visitation growth from 2024-25 until 2028-29 where it is anticipated to stabilise.
- Baseline Growth Scenario:** 18,750 additional MTB visitors per annum by year three of operations, with 25% achieved in 2022-23, increasing to 70% in 2023-24 and 100% in 2024-25. MTB visitation is then expected to trend in line with projected visitation growth from 2024-25 until 2026-27 where it is anticipated to stabilise.
- High Growth Scenario:** 22,500 additional MTB visitors by year three of operations, with 25% achieved in 2022-23, increasing to 70% in 2023-24 and 100% in 2024-25. MTB visitation is then expected to trend 25% above projected visitation growth from 2024-25 until 2025-26 where it is anticipated to stabilise.

It has been assumed that 55% of the visitor increase are daytrip visitors; these visitors are expected to be primarily those travelling from Canberra and Melbourne to the trails.

Domestic overnight visitors have been assumed to represent 40% of the visitor increase, and international representing 5%. Previous research indicates that domestic overnight visitors undertake between 2-5 rides per trip (3 assumed), whilst international visitors have been assumed the undertake 5 rides per trip, and domestic daytrip visitors just 1 ride (TRC Tourism, 2015, TRC Tourism, 2019).

Additional visitor usage (rides) in the Tumut Region has been demonstrated in Figure 5.3, this represents the net additional usage due to the project case compared to what would be expected to occur without the project.



Source: TRC Tourism (2015) TRC Tourism (2019), TRA (2020a, 2020b, 2020c).
Figure 5.3. Net additional visitor MTB usage per annum, Tumut Region

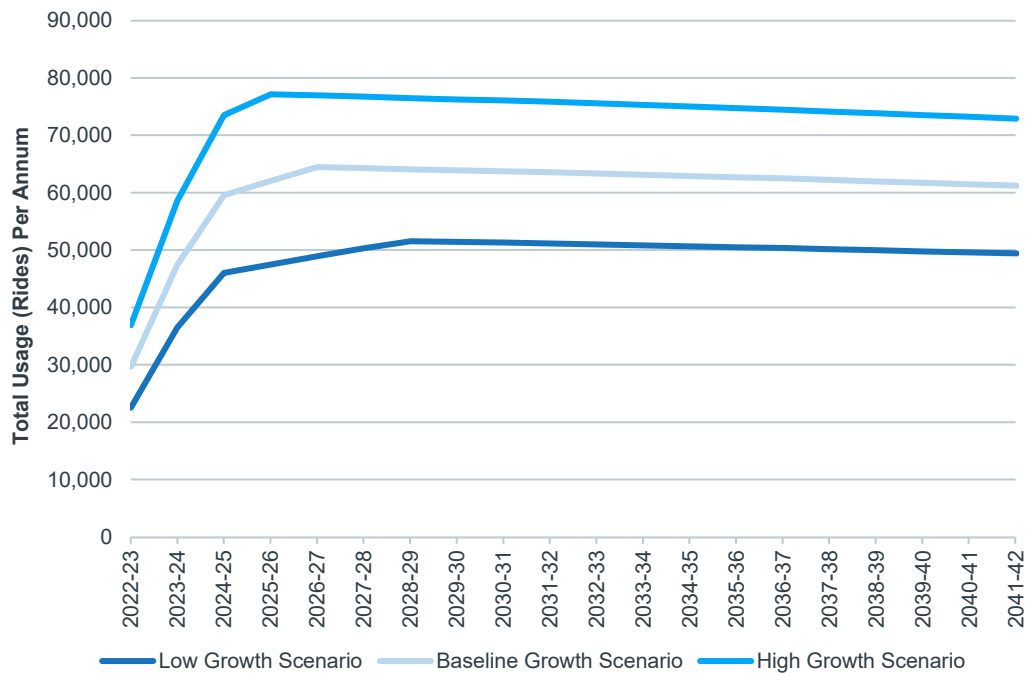


Image of the Talbingo Pump Track with Talbingo Township and Big Talbingo in the background (Natural Trails)

5.3. Overall demand outcomes

Total trail usage (including local and visitor usage) is anticipated to reach between approximately 22,500 (low growth) and 37,000 (high growth) rides per annum in 2022-23 and grow to between approximately 49,400 (low growth) and 73,000 (high growth) rides per annum by 2041-42.

The overall demand outcomes decline from 2030-31 to 2041-42 due to visitation demand stabilising whilst local demand declines slightly with the projected population decline.



Source: TRA (2020a, 2020b, 2020c), TRC (2013).
Figure 5.4. Total usage (Rides) per annum, 2022 to 2030

5.4. Increased visitation and visitor nights

The project has the potential to increase visitation and visitor spend in the following ways:

- Increase the length of stay associated with visitors who are anticipated to visit the region regardless of the project, who would now undertake mountain biking activities due to the project. This represents the non-core market, which includes those whereby mountain biking is not a primary motivator or sole purpose of travel, rather it is a complementary activity (see Appendix A for detail).
- Result in new visitation and visitor nights to the region solely for mountain biking purposes. This represents the core market which includes those who travel for the sole purpose of mountain biking at the destination. This market continually seeks out new and exciting destinations, and typically travels multiple times a year for mountain biking purposes (see Appendix A for detail).

It has been assumed that visitors who are anticipated to visit the region regardless of the project represent 40% of the total visitors using the trails, whilst new visitors represent 60% of the visitors using the trails.

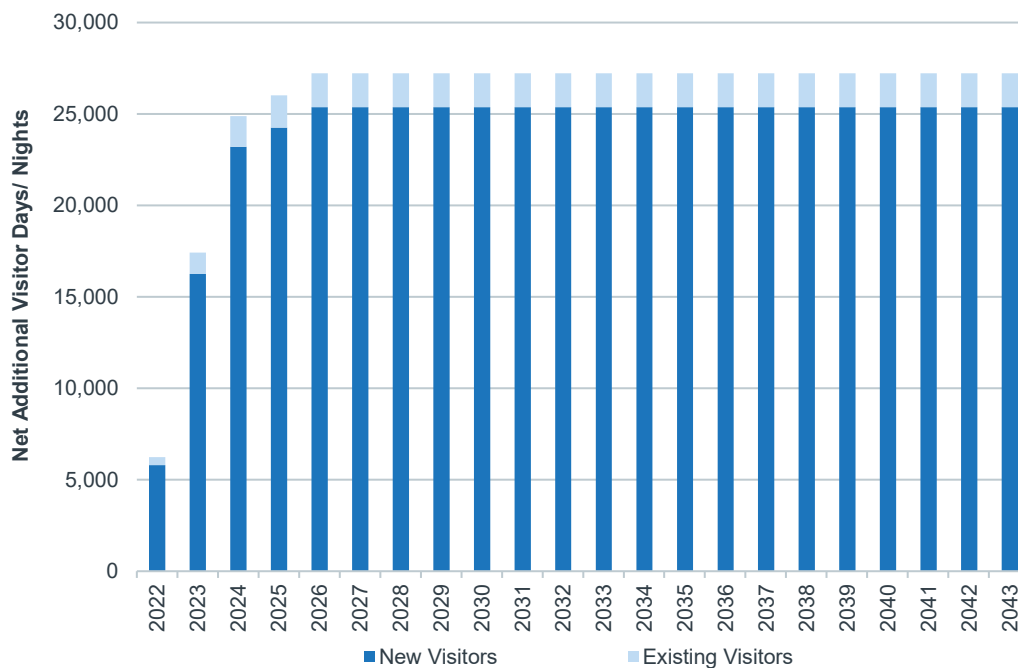
In estimating the net **new visitor** days/ nights generated as a result of the project, it has been assumed that:

- Domestic daytrip visitors stay for one day per trip
- Domestic overnight visitors on a medium-long length holiday (assumed to represent 40% of total domestic overnight visitors) stay for 5 nights per trip
- Domestic overnight visitors on a weekend holiday (assumed to represent 60% of total domestic overnight visitors) stay for 2 nights per trip
- International visitors stay for 7 days per trip.

In estimating the net **existing** visitor days/ nights generated as a result of the project, it has been assumed that:

- Daytrip visitors will not extend their stay (i.e. no transfer from daytrip visitors to overnight visitors)
- Domestic overnight and international visitors will stay for an additional 0.5 nights on average.

The following graph depicts the estimated total additional visitor days/ nights generated as a result of the project.



Source: TRA (2020a, 2020b, 2020c), TRC (2013).

Figure 5.5. Net new visitor days/ nights

5.4.1. Cycling growth case study comparisons

Case study analysis has been undertaken for four popular mountain biking destinations, to provide an indication of the potential visitor activity the Project may generate. Below provides a summary of each region's MTB trails, as well as key takeaways in terms of demand for the trails.

- **Derby (Tasmania):** Blue Derby is home to more than 80 kilometres of purpose-built mountain bike trails and is widely regarded as the mountain biking capital of Australia.

The trail network has found itself on the international radar, having been the first destination in Australia to hold the Enduro World Series competition (2019).

The trail network attracts more than 30,000 visitors annually (Blue Derby, 2020). Tourism Research Australia data indicates that prior to the initial development of the trail network, Derby (Scottsdale – Birdport SA2) attracted approximately 6,000 cycling visitors per annum on average (TRA, 2020a,b).

In more recent years, Derby has attracted an average of 29,200 cycling visitors per annum (**growth of 22,800 cycling visitors** since before investment). This growth can primarily be attributed to MTB visitors.

Visitation to Blue Derby is still in a significant growth stage, with annual usage of the trail network anticipated to grow to 50,000.

- **Jindabyne (New South Wales):** Jindabyne is a popular destination for MTB riders, having various trails located alongside the lake and through the mountains. Jindabyne has also benefited from the significant investment in the nearby Thredbo Bike Park, which has attracted more riders to the area.

Tourism Research Australia data indicates that prior to the initial trail investment, Jindabyne (Jindabyne – Berridale SA2) attracted an average of 16,600 cycling visitors per annum on average (TRA, 2020a,b). In more recent years, Jindabyne has attracted an average of 38,100 cycling visitors per annum (**growth of 21,400 cycling visitors** since before investment).

This growth can primarily be attributed to MTB visitors. Jindabyne provides an indication of a more mature cycling tourism market.

- **You Yangs (Victoria):** The You Yangs trail network comprises over 50 kilometres of trails, attracting more than 150,000 visitors annually (You Yangs, 2020).

MTB trails have been around in You Yangs for over a decade, and as such, it is a well-established destination for riding. Tourism Research Australia data indicates that prior to the initial trail investment, You Yangs (Lara SA2) attracted approximately 168,300 cycling visitors per annum on average (TRA, 2020a,b).

In more recent years, this has increased to approximately 262,400 (growth of **96,100 cycling visitors** since before investment). You Yangs provides an indication of a more mature cycling tourism market.

It is likely that the majority of visitors come from Melbourne, as there are limited trail networks on offer around the area.

- Stromlo (ACT):** Stromlo Forest Park has become a world-class sporting facility, attracting high profile events such as the World Mountain Bike and Trial Championships in 2009.

Since this event, visitation to the park has increased significantly, with approximately 167,000 visitors recorded in 2013 (ACT Government, 2013). Prior to development of the park, Tourism Research Australia data indicates the area (ACT – South West SA2) attracted just 200 cycling visitors.

Since development of the park, the area attracts an average of 8,000 visitors per annum (**an increase of 7,800 cycling visitors** since before investment). This growth can primarily be attributed to MTB visitors.

Further to the above, the Tumbarumba to Rosewood Rail Trail has recently reached 12,000 users since opening in April 2020. It can be expected that similar success be recorded for the Talbingo and Yarrangobilly trails.

The case studies of Derby and Jindabyne are considered to be the most appropriate reflection of what may be achievable for the Talbingo and Yarrangobilly trails.

These case studies indicate growth of more than 20,000 visitors participating in cycling activities since the trails were developed.

However, not all of this increase may be due to usage of the MTB trails themselves (though likely the majority is). It has been assumed that the 96,100 growth in visitation to You Yangs is largely due to the limited number of trails available for use around Melbourne, and hence the high visitation to the one area.

Conversely, the Snowy Valleys region (and surrounds) has an array of mountain biking opportunities on offer.

Based on these case studies, it may reasonably be expected that the Talbingo and Yarrangobilly Trail Network could potentially result in an increase in visitation of between approximately 15,000 and 22,500 for visitors using the MTB trails.



Image from Landers Falls Lookout (Natural Trails)

6. Economic modelling

The following modelling drivers have been used to assess the economic impact and costs and benefits associated with the project between the financial years ended June 2021 and 2041 (20-year operational analysis, assuming operations commence in 2021/22 with construction primarily in 2020/21).

The impact has been measured as an impact to the Snowy Valleys LGA economy.

Please refer to Appendix D for the Talbingo MTB Project Economic and Financial Analysis that outlines methods and assumptions used to perform the economic modelling.

6.1. Project costs

6.1.1. Capital costs

The projected capital cost associated with the development of the project is \$8.4 million. A breakdown of the costs is included in Table 6.1

For modelling purposes, it has been assumed that the construction phase will occur between 2020-21 and 2023-24, with early works and professional services in the first half of 2021, followed by a two-year construction program between 2021-22 and 2022-23.

Weed management and trail management in 2023-24 is included in the capital works program.

Table 6.1: Trail network and associated infrastructure capital costs

Cost Item	2020-21	2021-22	2022-23	2023-24	Total
Clearing and Trail Formation	\$0	\$1,840,000	\$1,840,000	\$0	\$3,680,000
Bridges	\$0	\$362,500	\$362,500	\$0	\$725,000
Underpass	\$0	\$225,000	\$225,000	\$0	\$450,000
Signage	\$0	\$100,000	\$100,000	\$0	\$200,000
Charging Stations	\$0	\$12,500	\$12,500	\$0	\$25,000
Raised Platforms	\$0	\$273,500	\$273,500	\$0	\$547,000
Rock Armour	\$0	\$23,000	\$0	\$0	\$23,000
Major Trailhead (Car Park)	\$0	\$350,000	\$0	\$0	\$350,000
Revegetation	\$0	\$61,000	\$61,000	\$0	\$122,000
Other Platforms	\$0	\$330,000	\$0	\$0	\$330,000
Site Establishment	\$20,000	\$0	\$0	\$0	\$20,000
Project Management	\$100,000	\$300,000	\$50,000	\$0	\$450,000
Rest Areas/ Trail Furniture	\$0	\$50,000	\$50,000	\$0	\$100,000
Charging System Set-Up Costs	\$0	\$0	\$50,000	\$0	\$50,000
Professional Fees	\$200,000	\$50,000	\$50,000	\$0	\$300,000
Construction Contingency	\$28,850	\$317,350	\$230,800	\$0	\$577,000
Weed Management	\$0	\$50,000	\$50,000	\$50,000	\$150,000
<i>Seed Funding</i>					
Capital Equipment	\$0	\$100,000	\$0	\$0	\$100,000
Trail Management	\$0	\$25,000	\$75,000	\$100,000	\$200,000
Total	\$348,850	\$4,469,850	\$3,430,300	\$150,000	\$8,399,000

Source: Natural Trails, TouchPoint One, AEC.

A breakdown of the trail elements is included in Appendix E

Post construction, periodic renewal of capital assets will be required as they reach the end of their useful life.

The economic and financial modelling has been undertaken over a 20-year operational assessment period, and as such, capital replacement will be required for the charging stations and capital equipment over this period.

Due to the regular ongoing maintenance of the trail, including machine re-building works every five to ten years, a full replacement of the trail may not be necessary at the end of its useful life, therefore the full replacement cost may not be required to be funded by Council.

6.1.2. Operating costs

Operating and maintenance costs associated with the project include employee costs, annual corridor pruning, machine rebuilding works, insurances, equipment, marketing and promotion, consultants, equipment and materials, maintenance, and replacement costs. Estimates of operating expenses have been developed based on the experience of other newly established MTB trails.

Operating expenses have been summarised in Table 6.2.

Some initial management and maintenance costs are covered through the seed funding between 2021-22 and 2023-24. Operating expenses have been estimated to remain constant from 2024-25 onwards. However, in addition to these costs some periodic machine rebuilding works of the trails will be required at an estimated cost of \$35,000 per annum over three years. Over the first 20 years of operations these are indicatively projected to occur every 5 to 10 years, and for modelling are assumed to occur between 2027-28 to 2029-30 and 2037-38 to 2039-40.

Table 6.2. Trail network operating costs per annum (all scenarios)

Cost Item	2020-21	2021-22	2022-23	2023-24	2024-25
Staffing Costs (Trail Maintenance/ Management)	\$0	\$0	\$0	\$0	\$25,000
Annual Corridor Pruning	\$0	\$0	\$0	\$0	\$10,000
Consultants/ Sub-Contractors	\$0	\$0	\$0	\$0	\$10,000
Insurance	\$0	\$5,000	\$5,000	\$5,000	\$5,000
Marketing and Promotion	\$0	\$7,500	\$7,500	\$7,500	\$7,500
Equipment and Materials	\$0	\$0	\$0	\$0	\$5,000
Maintenance of Charging Stations	\$0	\$0	\$250	\$500	\$500
Total	\$0	\$12,500	\$12,750	\$13,000	\$63,000

Notes: It is assumed marketing and promotion activities will also be undertaken by Destination NSW Riverina-Murray as part of their existing annual marketing activities for the region.

6.2. Visitor expenditure

As outlined in section 5.4, the project is anticipated to:

- Increase the length of stay associated with visitors who are anticipated to visit the region regardless of the project, who would now undertake mountain biking activities due to the project.
- Result in new visitation and visitor nights to the region solely for mountain biking purposes.

Visitor expenditure has been assumed in line with the typical domestic daytrip, domestic overnight, and international visitor expenditure profile to the Snowy Valleys

LGA in 2018. The average day/ night expenditure per visitor broken down by type is outlined below:

- Domestic daytrip - \$76
- Domestic overnight - \$285 (including \$160 on accommodation)
- International - \$113 (including \$56 on accommodation).

Based on these assumptions and those in section 5.4 (outlining the induced visitation and visitor nights associated with the project), the overall induced visitor expenditure in the region due to the project is approximately \$2.5 million in the first year of operations (under the baseline growth scenario), which continues to grow in line with demand.

6.3. Cost benefit analysis

The cost benefit analysis provides an overview of the net economic costs and benefits associated with the project between the years 2020-21 and 2041-42 (20-year operational analysis to reflect the useful life of the majority of the built infrastructure).

The costs and benefits have been assessed against three real discount rates (4%, 7% and 10%) with the focus of reporting on the standard 7% discount rate.

As real discount rates are used, all values presented are in real dollar terms, and do not include inflation.

The geographical scope of the project impact is within the Snowy Valleys LGA. Costs and benefits assessed in this analysis relate to this catchment.

Table 6.3 table outlines the present value (PV) of the identified costs and benefits associated with the project between the 2020-31 and 2041-42 (20-year operational analysis), at discount rates of 4%, 7% and 10%.

The CBA modelling for the project indicates that at all discount rates assessed the project is economically desirable for Snowy Valleys LGA, with the following results for the baseline growth scenario:

- A Net Present Value (NPV) of \$12.1 million over the 20-year operational assessment period with aggregated present value (PV) benefits of approximately \$23.1 million compared to an aggregated PV costs of approximately \$11.0 million (under the baseline growth scenario).
- A Benefit Cost Ratio (BCR) of 2.11, highlighting that the project is not economically desirable under the CBA modelling assumptions, returning \$2.11 for every dollar cost (under the baseline growth scenario).
- The induced visitor spend impact is the primary driver of the significant benefits attained from the project.

The cost benefit analysis identifies that the project is highly economically desirable at all discount rates, with the benefits outweighing the costs in all scenarios modelled. The BCR ranges between 2.51 (4% discount rate) and 1.79 (10% discount rate).

Table 6.3. Summary CBA results, baseline demand scenario

Factor	Total Value (\$M)	PV (\$M) -4% Discount Rate	PV (\$M) -7% Discount Rate	PV (\$M) -10% Discount Rate
Costs				
Capital Expenditure	\$8.4	\$7.9	\$7.6	\$7.3
Operational Expenditure	\$1.3	\$0.8	\$0.6	\$0.4
Environmental Impact	\$1.1	\$0.7	\$0.6	\$0.4
Injuries	\$4.7	\$3.0	\$2.2	\$1.7
Total Costs	\$15.5	\$12.5	\$11.0	\$9.9
Benefits				
Facility Revenue	\$1.4	\$0.9	\$0.7	\$0.5
National Park Pass Revenue	\$9.8	\$6.3	\$4.6	\$3.5
Bike Hire Producer Surplus	\$0.5	\$0.3	\$0.2	\$0.2
Shuttle Service Producer Surplus	\$1.2	\$0.7	\$0.6	\$0.4
Benefit from Induced Visitor Expenditure	\$18.0	\$11.4	\$8.5	\$6.5
Health Benefit	\$17.9	\$11.4	\$8.5	\$6.5
Underpass Residual Value	\$0.3	\$0.1	\$0.1	\$0.0
Total Benefits	\$49.1	\$31.2	\$23.1	\$17.6
Summary				
Net Present Value (NPV)	-	\$18.8	\$12.1	\$7.8
Benefit Cost Ratio (BCR)	-	2.51	2.11	1.79

Note: Totals presented in the table may not equal the sum of costs and benefits due to rounding.
Source: AEC.

6.3.1. Inclusion of an amenity benefit

The CBA results in section 6.3 exclude an amenity benefit for users. This has been done as user amenity will in part be covered by the access fee and park pass (which reflect the minimum that users are willing to pay), as well as the health benefit.

However, as part of sensitivity testing, a scenario which includes an additional amenity benefit for using the trails will be included, based on research regarding people's willingness to pay to access MTB trails. This would further enhance the net present value and benefit cost ratio demonstrated in section **Error! Reference source not found.**

The amenity benefit is equal to the willingness to pay by the user minus the access fee. The CBA utilised an access fee of \$1.50, whilst research suggested a willingness to pay by users of \$3.64 per use, equating to an amenity benefit of \$2.14. The following table reflects the impact of including this additional benefit.

Table 6.4. Summary CBA results, baseline demand scenario incl. rider amenity benefit

Impact	Total Value (\$M)	PV (\$M) - 4% Discount Rate	PV (\$M) - 7% Discount Rate	PV (\$M) - 10% Discount Rate
Costs				
Capital Expenditure	\$8.4	\$7.9	\$7.6	\$7.3
Operational Expenditure	\$1.3	\$0.8	\$0.6	\$0.4
Environmental Impact	\$1.1	\$0.7	\$0.6	\$0.4
Injuries	\$4.7	\$3.0	\$2.2	\$1.7
Total Costs	\$15.5	\$12.5	\$11.0	\$9.9
Benefits				
Facility Revenue	\$1.4	\$0.9	\$0.7	\$0.5
National Park Pass Revenue	\$9.8	\$6.3	\$4.6	\$3.5
Bike Hire Producer Surplus	\$0.5	\$0.3	\$0.2	\$0.2
Shuttle Service Producer Surplus	\$1.2	\$0.7	\$0.6	\$0.4
Benefit from Induced Visitor Expenditure	\$18.0	\$11.4	\$8.5	\$6.5
Health Benefit	\$17.9	\$11.4	\$8.5	\$6.5
Amenity Benefit	\$2.6	\$1.7	\$1.2	\$1.0
Underpass Residual Value	\$1.4	\$0.9	\$0.7	\$0.5
Total Benefits	\$51.7	\$32.9	\$24.4	\$18.6
Summary				
Net Present Value (NPV)	-	\$20.4	\$13.4	\$8.7
Benefit Cost Ratio (BCR)	-	2.64	2.22	1.88

Note: Totals presented in the table may not equal the sum of costs and benefits due to rounding.
Source: AEC.



Image of Cooma Mountain Bike Trails (Natural Trails)

6.4. Economic impact assessment

6.4.1. Construction impacts

The economic contribution of the construction of the trail network to the Snowy Valleys LGA economy is presented in Table 6.5.

Modelling indicates the Project is anticipated to support an estimated 21 full time equivalent (FTE) jobs in Snowy Valleys LGA, comprised of 10 FTE jobs directly, as well as 11 FTE jobs supported through flow-on activity (including both Type I and Type II flow-on activity).

Jobs supported by the project are estimated to pay \$1.5 million in wages and salaries, including direct and flow-on jobs.

The Project is estimated to produce around \$6.2 million in output for Snowy Valleys LGA businesses during construction (including direct and flow-on activity).

This is estimated to produce \$2.9 million in Gross Regional Product (GRP), including \$1.3 million in GRP directly and \$1.6 million through flow-on activity. These results represent the economic contribution of the Project within the Snowy Valleys LGA.

Table 6.5. Economic contribution of Talbingo and Yarrangobilly MTB trail network construction, Snowy Valleys LGA

Impact	Output (\$M)	GRP (\$M)	Incomes (\$M)	Employment (FTEs)
Initial Stimulus in Local Economy	\$3.1	\$1.3	\$0.7	10
Production Induced Impacts	\$1.5	\$0.6	\$0.4	5
Household Consumption Impacts	\$1.6	\$1.0	\$0.4	6
Total Impacts in Local Economy	\$6.2	\$2.9	\$1.5	21

Note: Totals may not sum due to rounding. Flow-on contribution has been disaggregated by Type I (production induced) and Type II (consumption induced) impacts. See Appendix A for definitions of Type I and Type II flow-on impacts.
Source: AEC.

6.4.2. Operations impacts

The economic contribution of the project to the Snowy Valleys LGA economy is presented in Table, including the economic contribution from operations, and expenditure by visitors, shuttle users, and bike hires.

Modelling indicates operations of the Project and associated tourism expenditure of visitors is anticipated to support an estimated 55 full time equivalent (FTE) jobs in Snowy Valleys LGA per annum under the baseline growth scenario, comprised of 35 FTE jobs directly, as well as 20 FTE jobs supported through flow-on activity (including both Type I and Type II flow-on activity).

Under the baseline growth scenario, jobs supported by operations of the project are estimated to pay \$3.3 million in wages and salaries annually, including direct and flow-on jobs.

Operations of the Project is estimated to produce around \$11.8 million in output per annum for Snowy Valleys LGA businesses under the baseline growth scenario (including direct and flow-on activity).

This is estimated to produce \$6.3 million in GRP per annum, including \$3.2 million in GRP directly and \$3.1 million through flow-on activity (under the baseline growth scenario). These results represent the economic contribution of the operations of the project within the Snowy Valleys LGA each year under the baseline growth scenario.

Table 6.6. Economic contribution of Talbingo & Yarrangobilly MTB trail network operating activity, 2030-31, Snowy Valleys LGA

Impact	Output (\$M)	GRP (\$M)	Incomes (\$M)	Employment (FTEs)
Low Growth Scenario				
Initial Stimulus in Local Economy	\$5.3	\$2.7	\$1.6	30
Production Induced Impacts	\$1.6	\$0.7	\$0.4	5
Household Consumption Impacts	\$3.1	\$1.9	\$0.8	12
Total Impacts in Local Economy	\$10.0	\$5.3	\$2.8	46
Baseline Growth Scenario				
Initial Stimulus in Local Economy	\$6.3	\$3.2	\$1.9	35
Production Induced Impacts	\$1.8	\$0.9	\$0.5	6
Household Consumption Impacts	\$3.7	\$2.2	\$1.0	14
Total Impacts in Local Economy	\$11.8	\$6.3	\$3.3	55
High Growth Scenario				
Initial Stimulus in Local Economy	\$7.3	\$3.7	\$2.2	40
Production Induced Impacts	\$2.1	\$1.0	\$0.5	7
Household Consumption Impacts	\$4.3	\$2.5	\$1.1	16
Total Impacts in Local Economy	\$13.7	\$7.2	\$3.8	63

Note: Totals may not sum due to rounding. Flow-on contribution has been disaggregated by Type I (production induced) and Type II (consumption induced) impacts. See Appendix A for definitions of Type I and Type II flow-on impacts.
Source: AEC.

6.5. Financial analysis

For modelling purposes, indexation of capital costs, operational costs, and revenues of 2% per annum have been assumed.

Interest rates on positive cash balances have been assumed at 2% per annum and interest rates on negative cash balances have been assumed at 4% per annum.

The capital costs in section **Error! Reference source not found.** have been used together with the projected revenue identified in **Error! Reference source not found.** and operating costs identified in Table.

100% grant funding for all capital expenditure has also been assumed. All capital renewal items have been assumed to be funded through debt for the purposes of financial modelling.

6.5.1. Project feasibility

Table 6.7 contains the Net Present Value (NPV) for each of the scenarios modelled. The Internal Rate of Return (IRR), and Modified Internal Rate of Return (MIRR, more accurately reflects the cost and profitability of a project) is also shown for each scenario. As can be seen, both the Baseline and High Growth scenarios return a positive NPV.

Table 6.7. NPV, IRR, and MIRR Outcomes

	NPV	IRR	MIRR
Low Growth	-\$0.059m	14.3%	7.48%
Baseline	\$0.047m	2.90%	8.37%
High Growth	\$0.150m	NA	9.13%

Note: None of the above scenarios include a terminal value for the Trail Network.
Source: AEC.

6.5.2. Financial Sustainability

The financial analysis has identified that Council will be able to fund the project due to the 100% grant funding that is assumed will be available.

The level of modelled revenues escalating at 2.0% per annum will cover operational costs (excluding depreciation) in all scenarios, except in those years where machine re-building works are required to be undertaken.

From a cash flow perspective, the cumulative cash position under all scenarios is positive meaning that all operational costs (excluding depreciation) are covered by operating revenues.

For the purposes of financial modelling, the capital costs associated with the formation of the trail (excluding any built infrastructure) have been assumed to have a useful life of 20 years, to reflect the annual benefit of the trail to Council.

This results in an annual depreciation charge of \$191,670 (including contingency) for trail formation, however, this approach should be reviewed against Council's depreciation policy.

Due to the regular ongoing maintenance of the trail, including machine re-building works every five to ten years, a full replacement of the trail may not be necessary at the end of its useful life, therefore the full replacement cost may not be required to be funded by Council.

Capital costs of \$472,000 associated with revegetation and weed management have been written off in the first year following completion of the works.

The nearly \$400,000 cost of depreciation charges (including the trail formation depreciation) associated with the capital expenditure results in a significant operating loss under all scenarios.



Image of initial site inspection following the fires (TouchPoint One)

7. Governance arrangements

7.1. Assessment process

A critical outcome of the development of the Master Plan is the identification of an appropriate governance arrangement for the management and operation of the trail network and associated infrastructure and facilities.

The approach taken by the project team was to perform a critical review of the governance models allowable under the existing NSW legislative framework, within which Council and the NPWS operate.

In undertaking the assessment, and in making a recommendation for the preferred option, the following key principles were applied:

- That the governance model's arrangements and accountability are clear and easily understood
- That the strengths and expertise offered by each party are reflected in the responsibilities and authority reflected in the governance model
- That the governance model supports a focus on increasing tourism and visitation to the region as a significant trail destination
- That the governance model facilitates the maximisation of non-public revenue funding sources and re-investment in the trail network and facilities

7.2. Land tenure

The land to be used for the Talbingo and Yarrangobilly trail precinct is wholly controlled by the NSW NPWS who are subject to the *National Parks and Wildlife Act 1974* and *National Parks and Wildlife Regulation 2019*, which may fully or partially constrain their ability to implement or be party to any preferred governance model.

Any recommended governance model(s) will need to be tested against this legislation to determine the NPWS' ability to agree to such a model(s).

As the land is located within a National Park, it must remain in public ownership but can be leased or licensed for recreational and sporting purposes, subject to Ministerial approval, (*National Parks and Wildlife Act 1974 no 80, Part 12 S150 & S150A*).

As the proposed trail network has yet to be developed, the management needs of the network will differ change on the phase of operation (planning, construction, or operation). The governance model may therefore also need to adapt as the project is implemented, as each stage of development and operation will require different outcomes from the governance body.

7.3. Governance models

Three forms of governance models have been considered for the project:

- Models based on public land ownership and sole agency public operator (either with or without a community/ user reference group)
- Models based on public land ownership and community/ user group partnerships and operator
- Models based on public land ownership and private operator .

Models based on private land ownership have been excluded due to the public land tenure arrangements identified in Section 5.2.

7.4. Multi-criteria assessment

To undertake an assessment of the alternative governance options, several criteria have been identified to determine the extent to which the option will meet the following vision and outcome sought:

- That the governance arrangements and accountability are clear and easily understood
- That the strengths and expertise offered by each party are reflected in the responsibilities and authority reflected in the preferred option
- That the business model supports a focus on increasing tourism and visitation to the region as a significant trail destination
- That revenue funding can be maximised to finance re-investment in the trail network and facilities.

7.5. Preferred governance model

Initially, the Sole Agency Operator (with Reference Group) governance model is the recommended option, however, an appropriate way forward may be to transition to an Incorporated Body Operator within 3-5 years.

This transition period would allow time for the Reference Group members (notably Talbingo MTB Inc.) to develop and gain experience in managing the trail network and all parties to gain a better understanding of the:

- Operational revenues and costs of the operation
- Actual visitation growth and number of events
- Funding sources that may be accessible.

Without a final decision on a transition to an Incorporated Body Operator model, the financial analysis has been modelled based on the Sole Agency Operator only.

A detailed assessment of the characteristics, advantages, and disadvantages of each type of governance arrangements is included in Appendix D Talbingo MTB Project Economic and Financial Analysis.

8. Review of environmental factors

8.1. Summary of environmental factors

The site for the proposed MTB network is within Kosciuszko National Park which was reserved as a State Park in 1944. The park holds national and state conservation significance due to the following factors:

- The park contains all NSW's alpine regions and most of its sub-alpine areas
- The significant history of grazing, gold mining, skiing, and the Snowy Mountains Scheme
- The Aboriginal heritage and cultural significance
- The national and international educational and scientific resource it provides
- The protection it provides numerous habitats and threatened flora and fauna communities, and
- Containing and protecting significant water catchments

The Kosciuszko National Park Plan of Management 2006 which incorporates the Snowy Management Plan and details the overarching principles of the management of the park with the need for an environmentally sensitive and sustainable approach to maintaining the natural and cultural values.

The proposed MTB network is consistent with the recreational values and environmental stewardship and more specifically Section 8.11 of the plan of management and the *Kosciuszko National Park Plan of Management: To allow consideration of sustainable mountain biking opportunities amendments that were released in 2014*.

- “Developing clusters of linked short-duration recreational opportunities at sites along key roads at popular destinations”
- “The provision of opportunities for public understanding, enjoyment and appreciation of natural and cultural heritage values, including opportunities for sustainable visitor use
- “Benefits to local communities”
- “Environmental management systems are in place for all operations and activities conducted within the park”, and
- “The extent to which visitors, park neighbours, members of local communities and the general public take personal responsibility for protecting the values of the park is improved”.

8.2. Impact assessment

The development and installation of the proposed MTB network will be undertaken in such a way to minimise the impact to nature, historic and aboriginal areas of cultural significance, or geo-heritage locations, however the development will enable members of the public to access areas of Kosciuszko National Park that are not, currently, readily accessible providing greater opportunity for public appreciation and enjoyment of these areas of significance.

In addition, the proposed development will be developed to minimise the impact to nature, flora, and fauna so it is unlikely that threatened species, populations, and ecological communities would be impacted but the MTB network

The proposed MTB network will not impact World heritage items or places, Ramsar wetlands, or marine environment.

The Snowy Mountains Scheme and Australian Alps National Parks and Reserves, which includes Kosciuszko National Park, are on the National Heritage list in the area of the proposed MTB network. The MTB network trails will not impact the Snowy Mountains scheme.

It is unlikely that that threatened species, populations, and ecological communities would be impacted but the MTB network due to the minimal impact during development and installation.

8.3. Aboriginal Cultural Heritage

There is a land claim in the area of the proposed trails however the trail alignments have been adjusted to avoid the area of the land claim.

The only areas of aboriginal significance have been identified from an AHIMS search in the proposed MTB network paths are those in areas already impacted such as those at Yarrangobilly Caves.

There is minimal risk to Aboriginal areas of significance with the proposed MTB network and with the proposed mitigation measures there is negligible remaining risk.

Initial discussions have occurred through Parks NSW with feedback that the Council were not going to provide project endorsement from their perspective until they took the notes and maps to the next Local Aboriginal Land Council meeting which is in the New Year.

The group are were also going to discuss it with the local Aboriginal community prior to commenting.

Some other points made if the project was to proceed that the local Aboriginal community:

- Continue to be consulted throughout the development of the plan
- Are made aware of any recommendations or findings coming out of the REF
- Are interested in any sites identification and survey work should it be required in the formulation of the REF

The local Aboriginal community are interested in any opportunities there might be for involvement in construction and maintenance of the trail network if and when it eventuates

8.4. REF outcomes

The following points summarise the outcomes of the REF for the Talbingo and Yarrangobilly MTB Trail development project:

- There is not likely to be a significant effect on the environment therefore no environmental impact statement is required
- There is not likely to be a significant effect on threatened species, populations, ecological communities, or their habitats therefore no species impact statement is required

- The activity is in respect of land that is not, full or part of, critical habitat therefore no species impact statement is required
- The activity is not likely to significantly impact matters of national environmental significance listed under the *Commonwealth Environment Protection and Biodiversity Conservation Act*, and
- The activity will not require certification to the *Building Code of Australia, Disability (Access to Premises – Buildings) Standards 2010* or Australian Standards in accordance with the OEH Construction Assessment Procedure.

Refer to Appendix F for the complete REF document.



Image of flow trail at Thredbo Mountain Bike Park

9. Consultation

9.1. Stakeholder consultation

Stakeholder consultation will be undertaken between 18 December 2020 and 22 January 2021.

Outcomes of consultation will be collated and incorporated into the master plan.

9.2. Community consultation

Community consultation will be undertaken between 4 January 2021 and 22 January 2021.

Face to face community consultation sessions will be held in Talbingo and Tumut on 16 and 17 January.

Outcomes of consultation will be collated and incorporated into the master plan.

10. Construction planning

10.1. Construction methodology

The construction phase for the project will occur between 2020-21 and 2023-24, with early works and professional services in the first half of 2021, followed by a two-year construction program between 2021-22 and 2022-23.

To optimise construction efforts, and to open trails for riders as soon as possible, the trail network will be constructed using multiple trail crews, working on different trail sections or in unison to build network.

The initial construction focus will be on the Talbingo Precinct and specifically the Old Mountain area which will provide the opportunity to open a trail network for riders while other sections of the network are built.

Works on Big Talbingo area would develop in parallel to the Old Mountain area, however the trails on Big Talbingo will need to be built in their entirety before opening as the remote nature of the trails does not allow sections of the trail to be progressively opened.

The Yarrangobilly precinct will be constructed following the completion of the trails on Old Mountain. There is potential to open the Yarrangobilly trail in sections as an 'out & back' ride as construction progresses from Talbingo towards Yarrangobilly.

10.2. Construction program

The project has been divided into the following construction packages:

- Package 1 – Talbingo Precinct Trails
- Package 2 – Yarrangobilly Precinct Trails

Table 10.1 Trail network construction timeframe estimates

Project Timeframe		
Element	Unit / Assumption	Estimate
Package 1 Construction – Talbingo (51km)	Trail Construction @ 100m p/day + bridge and platform construction in parallel	102 weeks (2 years)
Package 2 Construction – Yarrangobilly (30km)		100 weeks (2 years)
Package 3 Construction – Snowy Valley		TBC

*construction estimates based on two machines / crews constructing 50m p/day each

10.3. Construction considerations

This project has been conceived and designed to provide the greatest benefit to the local and regional economy as part of a bushfire recovery strategy and broader economic sustainability of the region.

To achieve these outcomes, wherever possible, local contractors (for the supply of machinery / materials) and locally sourced labour should be utilised to deliver the project.

Due to the specialised nature of trail construction, the project will need to engage the skills of a suitably qualified professional trail builder to oversee and manage the design and delivery of the project. This trail builder can be supported by local labour.

Similar projects have seen the use of professional trail building companies to provide overall project management, construction systems and on-ground supervision and an experienced machine operator / team leader to manage each trail crew.

Within each crew, local labour is then sourced and trained in trail building and land management techniques.

The benefit of this approach is that these locals acquire the skills to manage and maintain trails after construction is completed.

10.4. Risk management

Identifying and managing project risks will be essential for the proactive management of issues and the successful delivery of the project.

Project risks include:

- Stakeholder support for the project, in particular NPWS and SVC support
- Failure to secure funding to deliver the project
- Environmental and Aboriginal Cultural Heritage factors that affect project delivery
- Contracting strategies to support the project
- Lack of suitable resources to deliver the project
- Ongoing management and maintenance requirements

A project risk register for the implementation phase of the project is included in Appendix G.

10.5. Environmental management

An environmental management plan must be developed for the activity and should include:

- The protection of flora and fauna;
- Control of movement of pedestrians, materials, vehicles, and plant;
- Conservation of site attributes
- Control of discharges and emissions from vehicles and plant.
- Prevention of pollution to land and water
- Soil erosion control
- Mitigation measures to minimise noise and vibrations to fauna and areas of cultural significance

10.6. Aboriginal Cultural Heritage management

Aboriginal Cultural Heritage Assessments will be required before construction can commence.

The Project Delivery Committee will work collaboratively with the traditional owners to confirm Cultural Heritage values for the area and to manage any impacts to Cultural Heritage values as a result of construction activities.

10.7. Planning approvals

The Project Delivery Committee will be required to liaise with NPWS and SVC to identify approval requirements for the project.

An approvals register should be developed to capture approval requirements and to monitor progress.



Image of Alpine trail construction (Natural Trails)

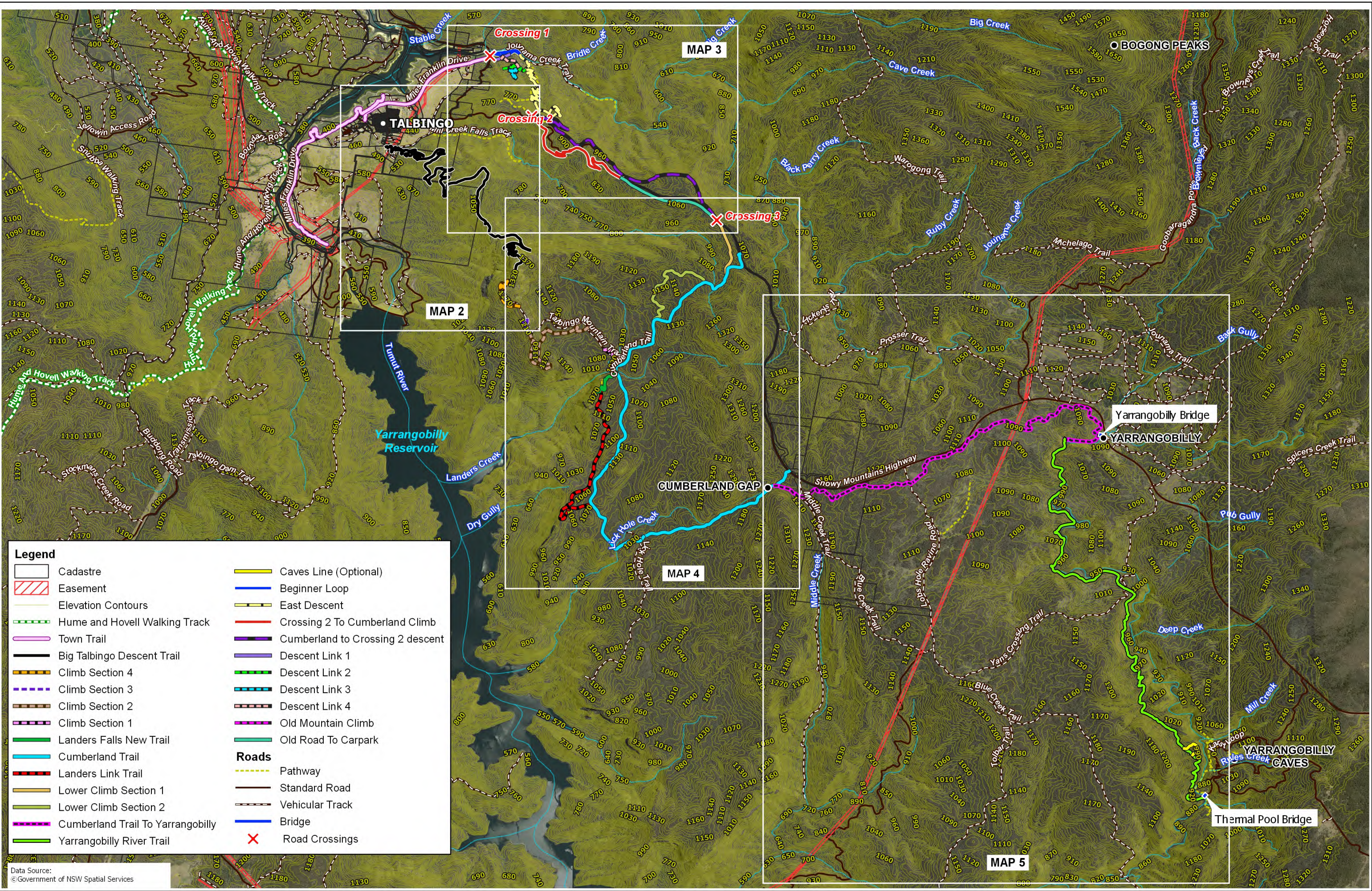
11. References

The following documents were used as references for the development of this Concept Plan:

- *National Parks and Wildlife Act 1974*
- *National Parks and Wildlife Regulation 2019*
- Kosciuszko National Park Cycling Strategy (Office of Environment and Heritage 2017)
- Snowy Valley Council Economic Development Strategy
- Snowy Valley Council Destination Management Plan
- Australian Mountain Bike Trail Development Guidelines (MTBA 2019)
- Kosciuszko National Park Plan of Management (2006)
- Destination Riverina Murray Strategic Plan 2019-2020
- Hume & Hovell Track Mountain Bike Master Plan (Snowy Valleys Council)
- Snowy Valleys Destination Management Plan (Destination Riverina Murray)

Appendix A – Talbingo region map

File Path: C:\GIS\Touchpoint\one\Talbingo\NSW\Workspaces\Map 1 Talbingo Site Plan A3.dwg



Legend

	Cadastral		Caves Line (Optional)
	Easement		Beginner Loop
	Elevation Contours		East Descent
	Hume and Hovell Walking Track		Crossing 2 To Cumberland Climb
	Town Trail		Cumberland to Crossing 2 descent
	Big Talbingo Descent Trail		Descent Link 1
	Climb Section 4		Descent Link 2
	Climb Section 3		Descent Link 3
	Climb Section 2		Descent Link 4
	Climb Section 1		Old Mountain Climb
	Landers Falls New Trail		Old Road To Carpark
	Cumberland Trail	Roads	
	Landers Link Trail		Pathway
	Lower Climb Section 1		Standard Road
	Lower Climb Section 2		Vehicular Track
	Cumberland Trail To Yarrangobilly		Bridge
	Yarrangobilly River Trail		Road Crossings

Data Source:
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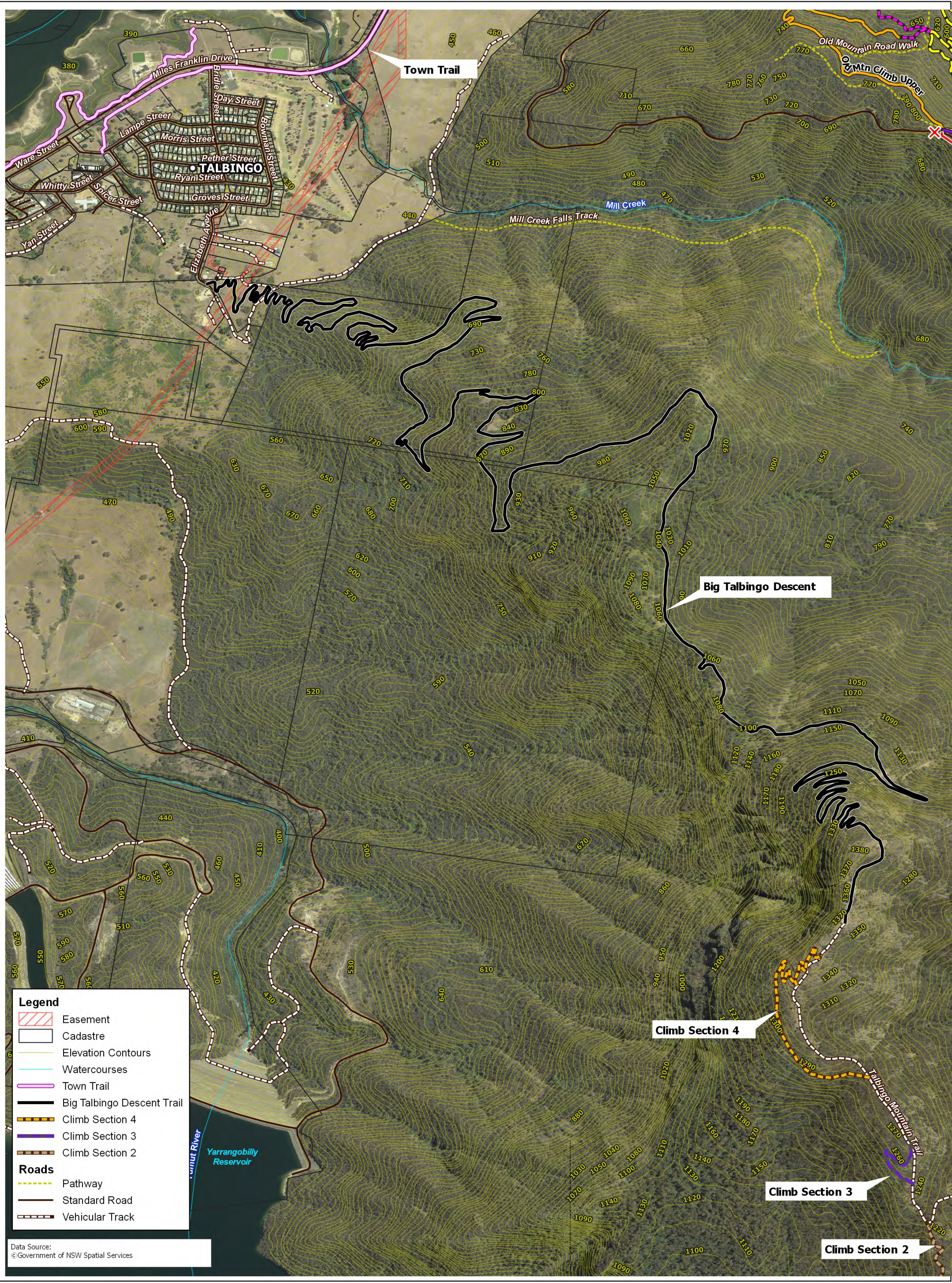


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












Map 1
Talbingo MTB Network
Trail Development Layout

Appendix B – Talbingo precinct trail network



Legend

-  Easement
-  Cadastre
-  Elevation Contours
-  Watercourses
-  Town Trail
-  Big Talbingo Descent Trail
-  Climb Section 4
-  Climb Section 3
-  Climb Section 2
- Roads**
-  Pathway
-  Standard Road
-  Vehicular Track

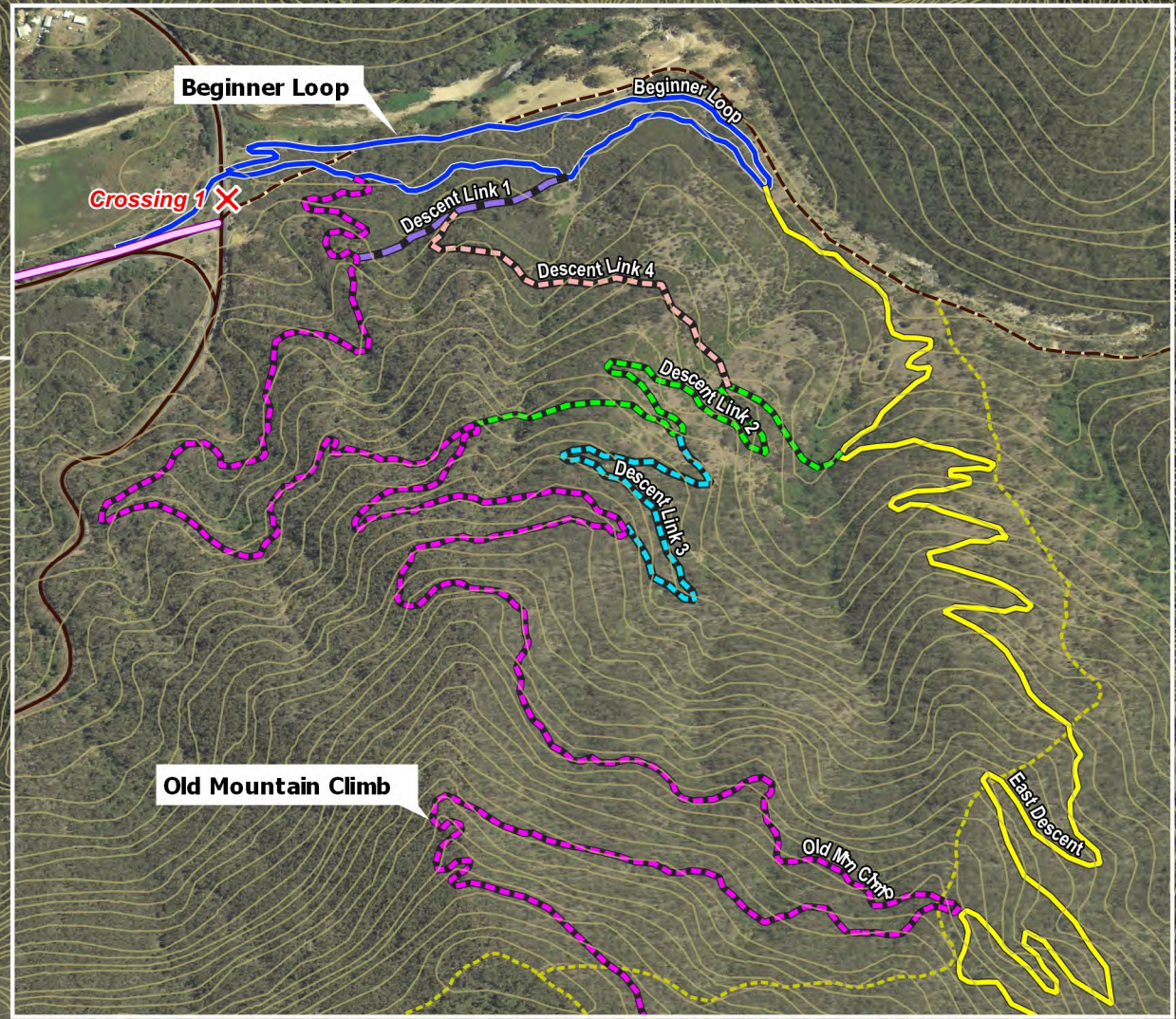
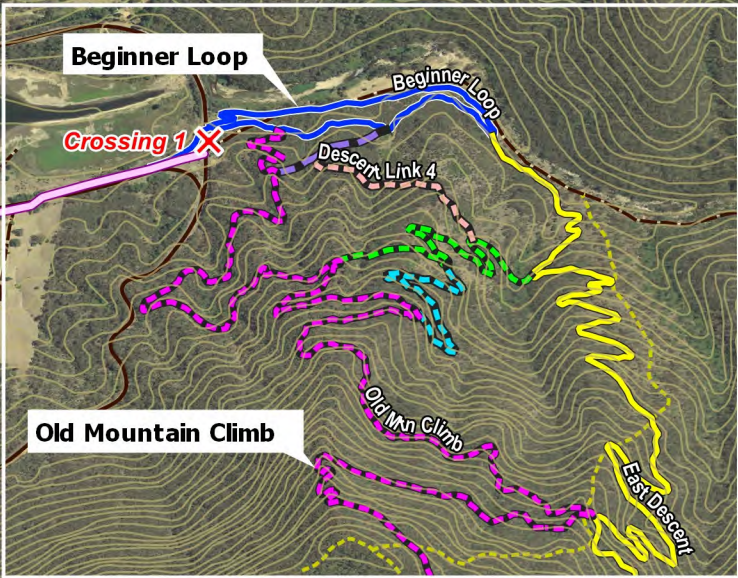
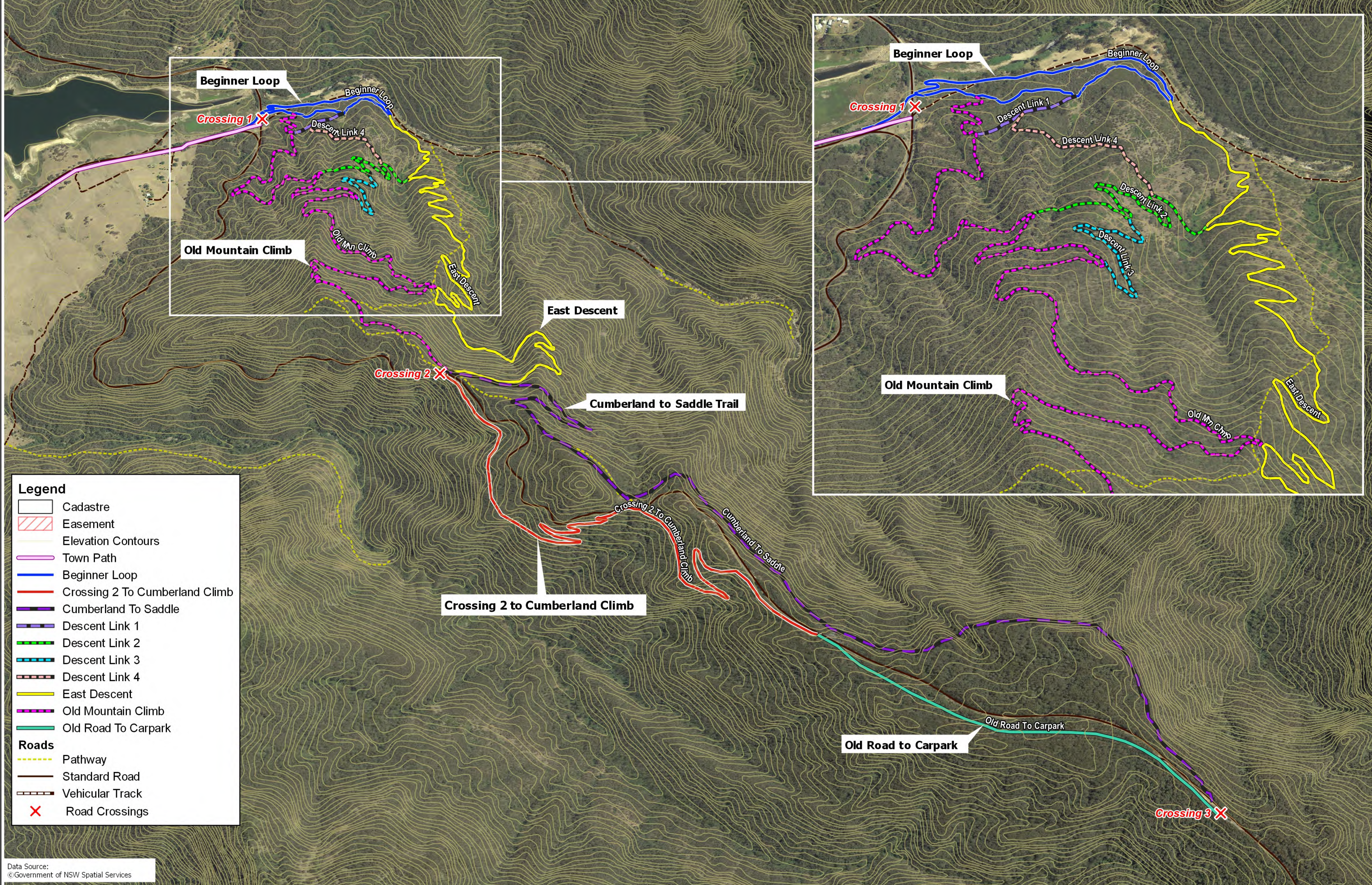
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Datum: GDA94





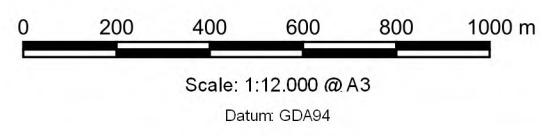
Legend

- Cadastre
- Easement
- Elevation Contours
- Town Path
- Beginner Loop
- Crossing 2 To Cumberland Climb
- Cumberland To Saddle
- Descent Link 1
- Descent Link 2
- Descent Link 3
- Descent Link 4
- East Descent
- Old Mountain Climb
- Old Road To Carpark

Roads

- Pathway
- Standard Road
- Vehicular Track
- Road Crossings

Data Source:
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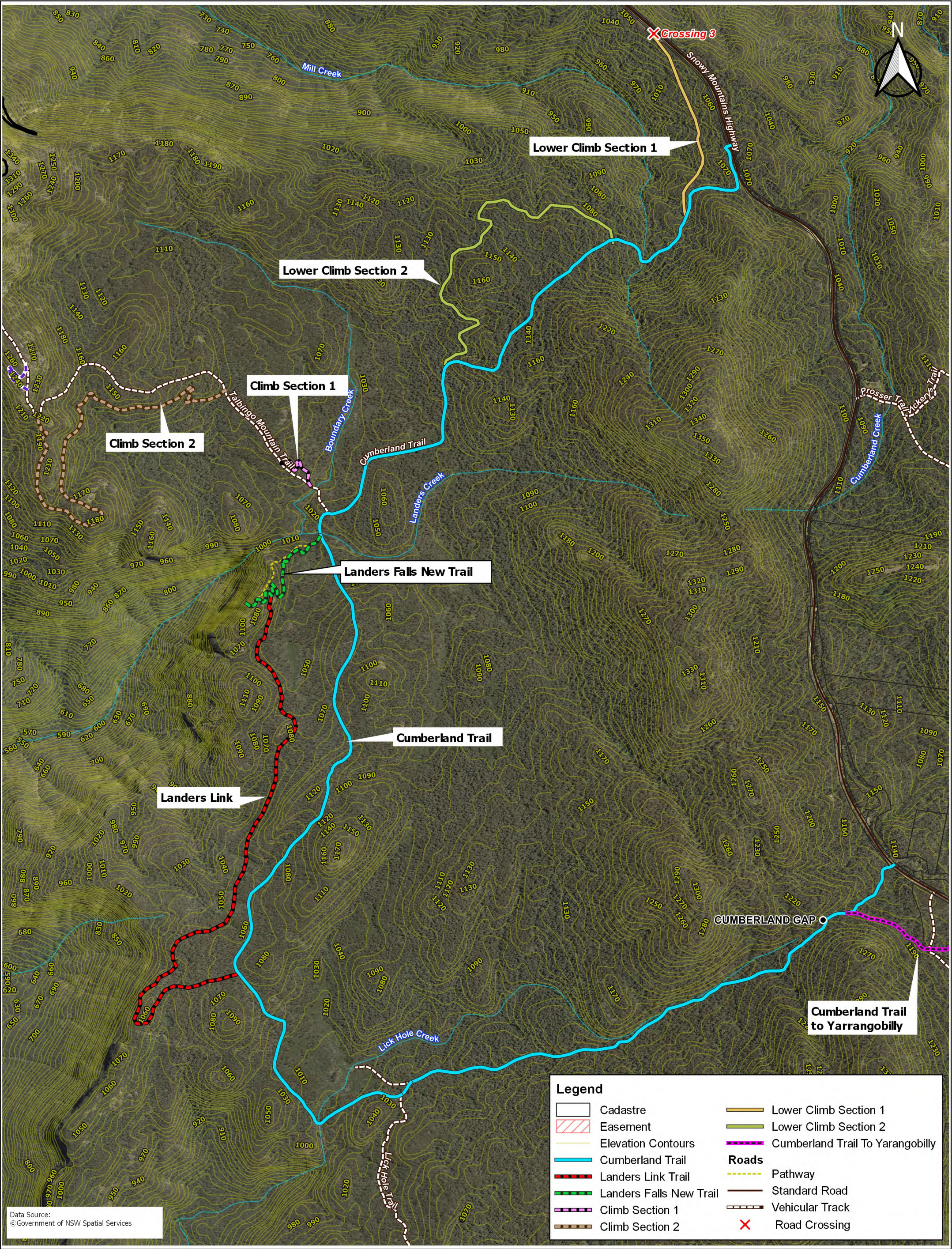


Appendix C – Yarrangobilly precinct trail network

File Path: C:\GIS\Touchpointone\Taibingbo NSW\Workspaces\Map 4 Yarrangobilly Upper Trails A3.qgs

©QGIS 2019

Data Source:
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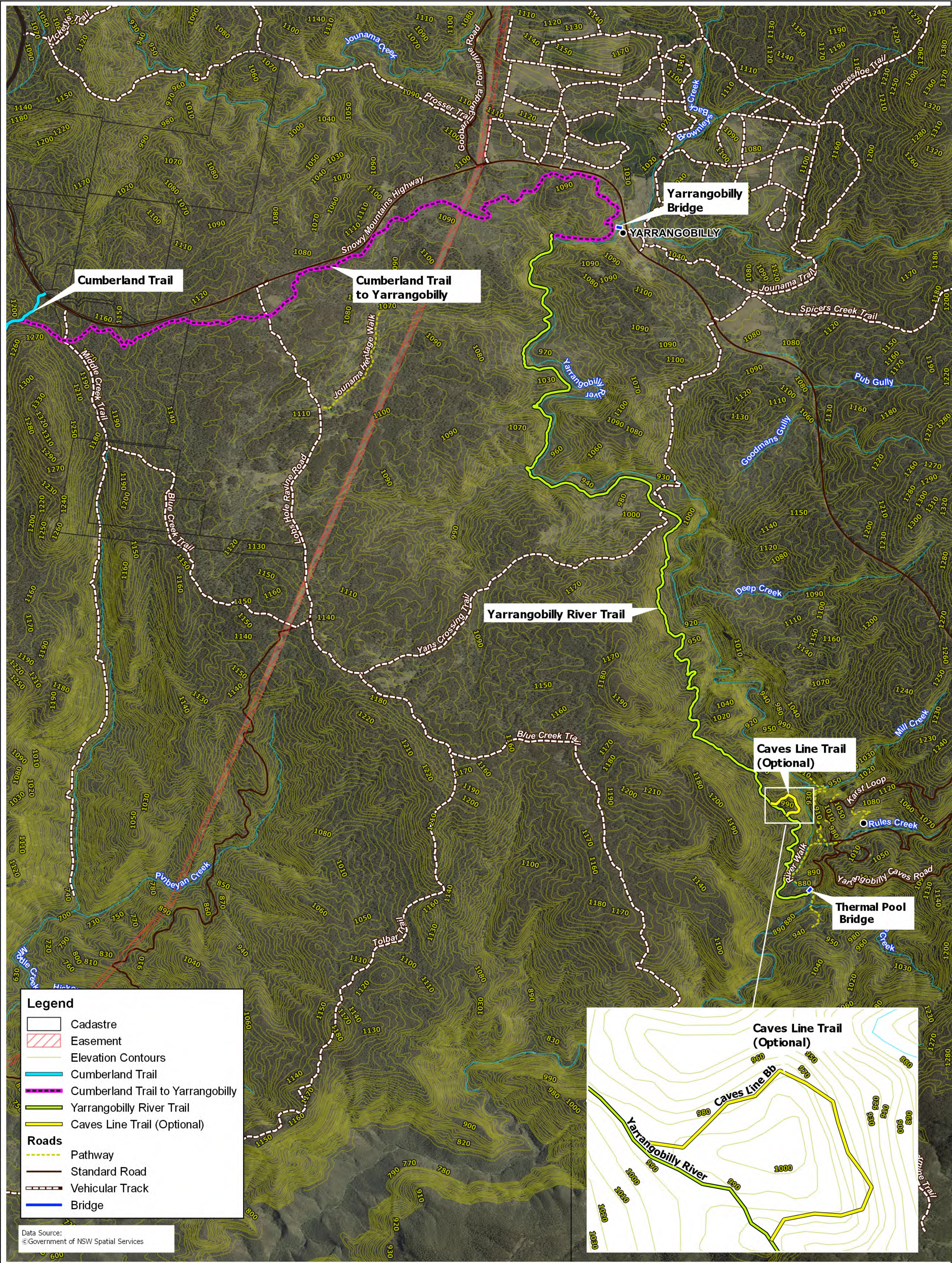
Legend			
	Cadastre		Lower Climb Section 1
	Easement		Lower Climb Section 2
	Elevation Contours		Cumberland Trail To Yarrangobilly
	Cumberland Trail	Roads	
	Landers Link Trail		Pathway
	Landers Falls New Trail		Standard Road
	Climb Section 1		Vehicular Track
	Climb Section 2		Road Crossing



Scale: 1:15,000 @ A3
Datum: GDA94

Map 4
Yarrangobilly Precinct MTB Trails
Yarrangobilly Upper Trails

Date: 01 December 2020



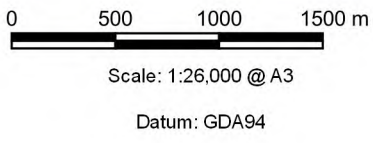
Legend

- Cadastre
- Easement
- Elevation Contours
- Cumberland Trail
- Cumberland Trail to Yarrangobilly
- Yarrangobilly River Trail
- Caves Line Trail (Optional)

Roads

- Pathway
- Standard Road
- Vehicular Track
- Bridge

Data Source:
 ©Government of NSW Spatial Services



Appendix D – Talbingo Economic and Financial Analysis

TALBINGO & YARRANGOBILLY MTB TRAIL NETWORK: ECONOMIC & FINANCIAL ASSESSMENT

SNOWY VALLEYS COUNCIL
DECEMBER 2020

aecgroup ltd.com

DOCUMENT CONTROL

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Job Name: Talbingo & Yarrangobilly MTB Trail Network: Economic & Financial Assessment
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Document Name: Talbingo MTB Trail Network Econ & Fin Assess v2.0
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Version	Date	Reviewed	Approved
Draft v1.0	10 December 2020	KL	ARP
Draft v2.0	15 December 2020	KL	KL

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EXECUTIVE SUMMARY

BACKGROUND & PURPOSE

Talbingo is a small township located in the Snowy Valleys Local Government Area (LGA) and is known as the gateway to the Snowy Mountains and Kosciuszko National Park. Typically, Talbingo is a location with high tourist visitation, however, in late 2019 and early 2020 the region was heavily impacted by bushfires. This caused loss of physical assets, loss of tourism visitation and spend as key sites in the Kosciuszko National Park and Selwyn Snowfields were damaged. This has resulted in the loss of summer and winter income sources for the township and the LGA, which has been further heightened by the COVID-19 pandemic. This has accelerated the need to explore new tourism opportunities, with mountain biking identified as a key prospect.

Talbingo currently records minimal mountain biking visitation by comparison to neighbouring regions. Leveraging off these popular mountain biking destinations, as well as existing trails in the Snowy Valleys region, the development of mountain bike trails near Talbingo has the potential to become a significant attractor for mountain bike tourism to the region, providing new business opportunities and increasing the economic benefits to existing businesses.

A Concept Plan providing a high-level outline of the scope of work for developing mountain bike (MTB) trails in the region was developed by Natural Trails on behalf of the Talbingo Mountain Bike Club in early 2020. Whilst the Concept Plan identified three potential precincts for trail development; the Talbingo Precinct and Yarrangobilly Precinct were identified as priority opportunities. As such, a Master Plan is currently being developed for the Talbingo and Yarrangobilly precincts. This report provides supporting demand, economic and financial analysis for the Talbingo and Yarrangobilly Mountain Bike Trail Network to provide Snowy Valleys Council and other key stakeholders with the necessary information required to make informed investment and management decisions. This report will deliver the following key outcomes:

- Demonstration of the potential market and demand for the project
- The economic implications of the project (including costs and benefits)
- The long-term financial implications to Council including the consideration of different operating models.

This information will be used to assist Snowy Valleys Council in receiving grant funding and ultimately progress the project.

APPROACH

In conducting the economic and financial assessment of the Talbingo and Yarrangobilly Mountain Bike Trail Network, AEC undertook:

- A market/ demand assessment based on a desktop research and a review of the mountain biking market (including analysis of case study/ benchmark regions with similar trails and their associated visitation data)
- A cost benefit analysis to understand the net socio-economic benefits of the project
- An input-output analysis to understand the direct and flow-on impacts of the project on the local Snowy Valleys LGA economy
- Financial modelling to understand the financial viability and implications of the project to Council finances.

Due to the limited availability of data/ information for the Talbingo Township, the remainder of the report refers to the Talbingo Township in the context of the aggregate of the Tumut Region Statistical Area 2 (SA2), in which the Talbingo Township is located, and the Tumut SA2. The aggregate of these two areas is hereafter referred to as the Tumut Region. The Tumut Region captures the area surrounding the township of Talbingo, whereby riders can access the Talbingo and Yarrangobilly MTB Trail Network within an hour of driving.

KEY FINDINGS

The report draws the following key findings following the conduct of the economic and financial assessments:

Existing Environment

- The Tumut Region is heavily reliant on tourism activity to support local businesses and generate economic activity. Due to this heavy reliance, the bushfires in late 2019 and early 2020 as well as the COVID-19 pandemic has had a significant impact on the economy and retention of residents.
- Indicative estimates of the impact of COVID-19 to the Snowy Valleys LGA economy to 31 October 2020 has been developed based on data from the Australian Bureau of Statistics (ABS, 2020b). These estimates suggest the pandemic resulted in a decline of approximately 200 employees and Gross Regional Product was estimated to decline by approximately \$21.6 million compared to 2018-19 estimates.
- There is a pressing need to explore new tourism opportunities, with mountain biking identified as a key prospect.

Market Analysis

- The Tumut Region currently records minimal mountain biking visitation by comparison to neighbouring regions.
- The cycling market and travel cycling market is recording strong growth year on year. The cycling tourism market (visitors that have recorded cycling as an activity on their trip) has grown by 9.7% in New South Wales on average per annum over the past 10 years. Mountain biking is estimated to represent a large proportion of this.
- Specifically, the e-bike market is poised for high growth of 6.2% on average per annum between 2020 and 2025 (globally). The rate of product development, investment, and consumer acceptance in Australia indicates that this market segment is on its way to becoming a mainstream category, as is the case in Europe.
- Leveraging off the existing trails in the Snowy Valleys region, the development of mountain bike trails near Talbingo has the potential to become a significant attractor for mountain bike tourism to the region, providing new business opportunities and increasing the economic benefits to existing businesses.

Economic Analyses

- The Cost Benefit Analysis identifies that the project is highly economically desirable under the 4%, 7% and 10% discount rates for all growth scenarios, returning a positive Net Present Value. The Benefit Cost Ratio ranges between 2.51 (4% discount rate) and 1.79 (10% discount rate) under the baseline growth scenario, indicating that for each dollar cost the project will generate between \$1.79 and \$2.51 in benefits (i.e. benefits outweigh the costs).
- Based on a capital cost of \$8.4 million, the Economic Impact Assessment identified that construction of the trail network will support approximately 21 FTE jobs, output of \$6.2 million, \$2.9 million in gross regional product, and wages and salaries of \$1.5 million (including direct and flow on activity).
- The Economic Impact Assessment identified operations of the facility will support approximately 55 full time equivalent jobs, output of \$11.8 million, \$6.3 million in gross regional product, and wages and salaries of \$3.3 million each year on average under the baseline growth scenario (including direct and flow on activity).

Governance Options

- Initially, a Sole Agency Public Operator (with Reference Group) governance model is the recommended option (e.g. Council managed and operated, supported by a community reference group that may include stakeholders such as the Talbingo Mountain Bike Club (Talbingo MTB Inc.), relevant local businesses/ community representatives and relevant NSW Government department(s)), however, an appropriate way forward may be to transition to an Incorporated Body Operator within 3-5 years (e.g. managed and operated by an incorporated body such as the Talbingo Mountain Bike Club, on behalf of Council).

- This transition period would allow time for the Reference Group members (such as Talbingo MTB Inc.) to develop and gain experience in managing the trail network and all parties to gain a better understanding of the:
 - Operational revenues and costs of the operation
 - Actual visitation growth and number of events
 - Funding sources that may be accessible.
- Without a final decision on a transition to an Incorporated Body Operator model, the financial analysis has been modelled based on the Sole Agency Operator only.

Financial Assessment

- The financial analysis has identified that Council will be able to fund the project due to the 100% grant funding that is assumed will be available.
- The level of modelled revenues escalating at 2.0% per annum will cover operational costs (excluding depreciation) in all scenarios, except in those years where machine re-building works are required to be undertaken.
- From a cash flow perspective, the cumulative cash position under all scenarios is positive meaning that all operational costs (excluding depreciation) are covered by operating revenues.
- While the project is cash flow positive, nearly \$400,000 in depreciation charges (including the trail formation depreciation) are associated with the capital expenditure, which results in a significant operating loss under all scenarios. However, it should be noted that for the purposes of financial modelling the capital costs associated with the formation of the trail (excluding any built infrastructure) have been assumed to have a useful life of 20 years, to reflect the annual benefit of the trail to Council. This results in an annual depreciation charge of \$191,670 (including contingency) for trail formation. This approach should be reviewed against Council's depreciation policy; due to the regular ongoing maintenance of the trail, including machine re-building works every five to ten years, a full replacement of the trail may not be necessary at the end of its useful life, therefore the full replacement cost may not be required to be funded by Council.
- The impact on Council finances under all scenarios shows:
 - The Operating Surplus Ratio is marginally worsened from 2021-22, when compared to the current Long-Term Financial Plan (LTFP).
 - The Net Financial Liabilities Ratio is unchanged, remains negative and is well below the maximum target of +60.0%.

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1. INTRODUCTION

1.1 BACKGROUND & PURPOSE

The Snowy Valleys local government area (LGA), located 175 km south-west of Canberra, is located in the South West Slope's region of New South Wales with much of the LGA occupied by the Kosciuszko National Park, which attracts thousands of visitors to the region for outdoor and adventure tourism each year.

Talbingo is a small township located in the Snowy Valleys LGA and is known as the gateway to the Snowy Mountains and Kosciuszko National Park. It is surrounded by National Park and provides easy access to the Talbingo and Blowering Reservoirs for water sport activities and the Selwyn Snowfields for winter sports.

Typically, Talbingo is a location with high tourist visitation, with the broader Tumut Region recording strong visitor growth of 5.0% per annum on average between 2005 and 2019. In late 2019 and early 2020, Talbingo and the Snowy Valleys LGA was heavily impacted by bushfires, which caused loss of physical assets and loss of tourism visitation and spend as key sites in the Kosciuszko National Park and Selwyn Snowfields were damaged. This has resulted in the loss of summer and winter income sources for the township and the LGA, which has been further heightened by the COVID-19 pandemic. This has accelerated the need to explore new tourism opportunities, with mountain biking identified as a key prospect.

Whilst a popular tourist destination, Talbingo (and more broadly the Snowy Valleys LGA) currently records minimal mountain biking visitation by comparison to neighbouring regions, including Jindabyne to the south and Canberra to the east. Leveraging off these popular mountain biking destinations, as well as existing trails in the Snowy Valleys region, the development of mountain bike trails near Talbingo has the potential to become a significant attractor for mountain bike tourism to the region, providing new business opportunities and increasing the economic benefits to existing businesses.

A Concept Plan providing a high-level outline of the scope of work for developing mountain bike (MTB) trails in the region, using the township of Talbingo as the central hub with off-road linking trails to the wider trail network, was developed by Natural Trails on behalf of the Talbingo Mountain Bike Club in early 2020. The Concept Plan identified three potential precincts for trail development; the Talbingo Precinct and Yarrangobilly Precinct were identified as priority opportunities with the Snowy Valley Precinct identified as a longer-term opportunity providing linkages to Tumut, Batlow, and Tumbarumba.

A Master Plan is currently being developed for the Talbingo and Yarrangobilly precincts (hereafter referred to as the Talbingo and Yarrangobilly MTB Trail Network, or the project). This report provides supporting demand, economic and financial analysis for the Talbingo and Yarrangobilly MTB Trail Network to provide Snowy Valleys Council (Council) and other key stakeholders with the necessary information required to make informed investment and management decisions. This report will deliver the following key outcomes:

- Demonstration of the potential market and demand for the project
- The economic implications of the project (including costs and benefits)
- The long-term financial implications to Council including the consideration of different operating models.

This information will be used to assist Council in receiving grant funding and ultimately progress the project.

1.2 APPROACH

The report follows a simple six stage approach:

- **Regional Overview (Chapter 2):** Provides an overview of the Talbingo Township and broader Snowy Valleys LGA.
- **Project Description (Chapter 3):** Provides an overview of the proposed infrastructure, capital costs, need for the project, anticipated impacts of the project, projected demand, and detail regarding the operations of the facility.

- **Cost Benefit Analysis (Chapter 4):** A cost benefit analysis was undertaken. This involved identifying, quantifying, and valuing all anticipated financial, economic, social, and environmental benefits and costs of the project, incorporating projected demand and anticipated development and operating costs/ revenues. Benefits and costs were annualised for inclusion in the cost benefit analysis and were assessed across a range of discount rates to identify the Net Present Value and Benefit Cost Ratio of the project.
- **Economic Impact Assessment (Chapter 5):** An economic impact assessment of the regional impacts from construction and operations was undertaken using Input-Output modelling to identify the direct and flow-on jobs and economic activity supported.
- **Financial Analysis (Chapter 6):** A financial analysis has been carried out to determine what the operational and capital costs of the facility are over a 20-year operational period.
- **Key Findings (Chapter 7):** Key findings were drawn based on the economic and financial assessments.

2. REGIONAL OVERVIEW

2.1 SNOWY VALLEYS LOCAL GOVERNMENT AREA

The Snowy Valleys LGA is located 175 km south-west of Canberra with a geographic area of more than 8,960km² and a population of approximately 14,500 (ABS, 2020). Large portions of the region, which is located in the South West Slope's region of New South Wales, is occupied by the Kosciuszko National Park, which attracts thousands of visitors to the region for outdoor and adventure tourism each year. Key townships within the Snowy Valleys LGA include Talbingo, Batlow, Tumbarumba, Tumut, and Adelong (see Figure 2.1).

Figure 2.1. Regional Map of Talbingo and Snowy Valleys LGA



Source: AEC.

2.2 TOWNSHIP OF TALBINGO

Talbingo is a small township within the Snowy Valleys LGA at the northern edge of the Kosciuszko National Park. The township, originally built to support the Snowy Mountains scheme, is situated between the Blowering Dam to the north and Talbingo Dam to the south – which are significantly accessed for both water sports and also hydro-electricity generation activities. The Talbingo township is approximately 40km from Tumut and 65km north of Tumbarumba, though driving distance is approximately double to Tumbarumba as there is no direct road link through the mountain and waterway areas between these two townships. The town is known as the Gateway to the Snowy Mountains and Kosciuszko National Park.

According to Census of Population and Housing data, the township recorded a resident population of 226 persons in 2016, with a further 13 residents elsewhere in the outlying areas of the Talbingo suburb surrounding the town (ABS, 2017). This represented an increase from the 199 residents in the township in 2011 but a contraction from the nearly 300 residents in 2001. The town of Talbingo also contains approximately 280 dwellings, however, in 2016 only around 30% of these were occupied by residents – a significant proportion of the dwelling stock is used

as holiday houses and temporary accommodation for visitors to the region and are typically only fully occupied during peak tourism periods.

With significant access to natural assets, Talbingo has also become a springboard to an exceptional environment for outdoor recreation, experience, education, and adventure. The region offers a range of adventure and outdoor tourism activities to thousands of visitors annually, with popular outdoor pursuits including water skiing, fishing and bush walking, as well as skiing in the winter months, with the snow fields at Mt Selwyn less than an hour's drive away.

The local workforce in Talbingo is small, with approximately 60 employed residents in the suburb as of 2016 (ABS, 2017). Of these persons, approximately 25% work in either the hydro-electricity generation industry or support the industry through electrical services and maintenance. Around 20% of workers are in the accommodation and food services industry and 8% in cleaning services, supporting tourism activities.

The town's hydro-electricity generation workforce may increase moving forward due to skilled workers relocating to the region for to support the development of Snowy 2.0. In the short to medium term, the construction workforce associated with Snowy 2.0 may also deliver a lift in both temporary and permanent residents. Snowy 2.0 is an expansion of the Snowy Mountains Hydro-electric scheme, which will see the Talbingo Dam become Australia's largest green energy project and the world's largest pumped storage plant, upon completion (Power Technology, 2019).

Due to the limited availability of data for the Talbingo Township, the remainder of the report refers to the Talbingo Township in the context of the aggregate of the Tumut Region Statistical Area 2 (SA2), in which the Talbingo Township is located, and the Tumut SA2 (hereafter referred to as the Tumut Region).

2.3 TUMUT REGION

The Tumut Region captures the area surrounding the township of Talbingo, whereby riders can access the Talbingo and Yarrangobilly MTB Trail Network within an hour of driving. This region has been utilised as the reference geography in the remainder of the report.

Historically, the Tumut Region's population has declined by 0.4% per annum on average between 2001 and 2019, to reach a population of approximately 5,600 people (ABS, 2020). During summer, the region is bustling with tourists generating economic and business activity, however, it struggles to retain residents and maintain this activity throughout the year. Population projections suggest the resident population in the Tumut Region will continue to decline by 1.0% on average per annum to reach a population of approximately 4,500 people by 2041 (a 1,000 person decline since 2019).

In 2018-19, there were approximately 1,290 jobs in the Tumut Region (AEC, unpublished). The primary industries these jobs were engaged in included sheep, grains, beef and dairy cattle, other agriculture, primary and secondary education services, electricity generation, construction services, and paper product manufacturing.

Since 2005, visitation to the Tumut Region has recorded strong growth of 5.0% per annum on average to reach approximately 286,247 visitors in 2019 (TRA, 2020a, 2020b). Growth has been predominantly driven by the domestic daytrip market, which also comprises the largest share of visitation to the region (58.0% of Tumut Region visitors). Visitation year to year can be relatively volatile, however, the overall trend indicates that visitation has experienced significant upward growth since 2005. This is likely due to the development of major tourism activities, including those in the Snowy Hydro.

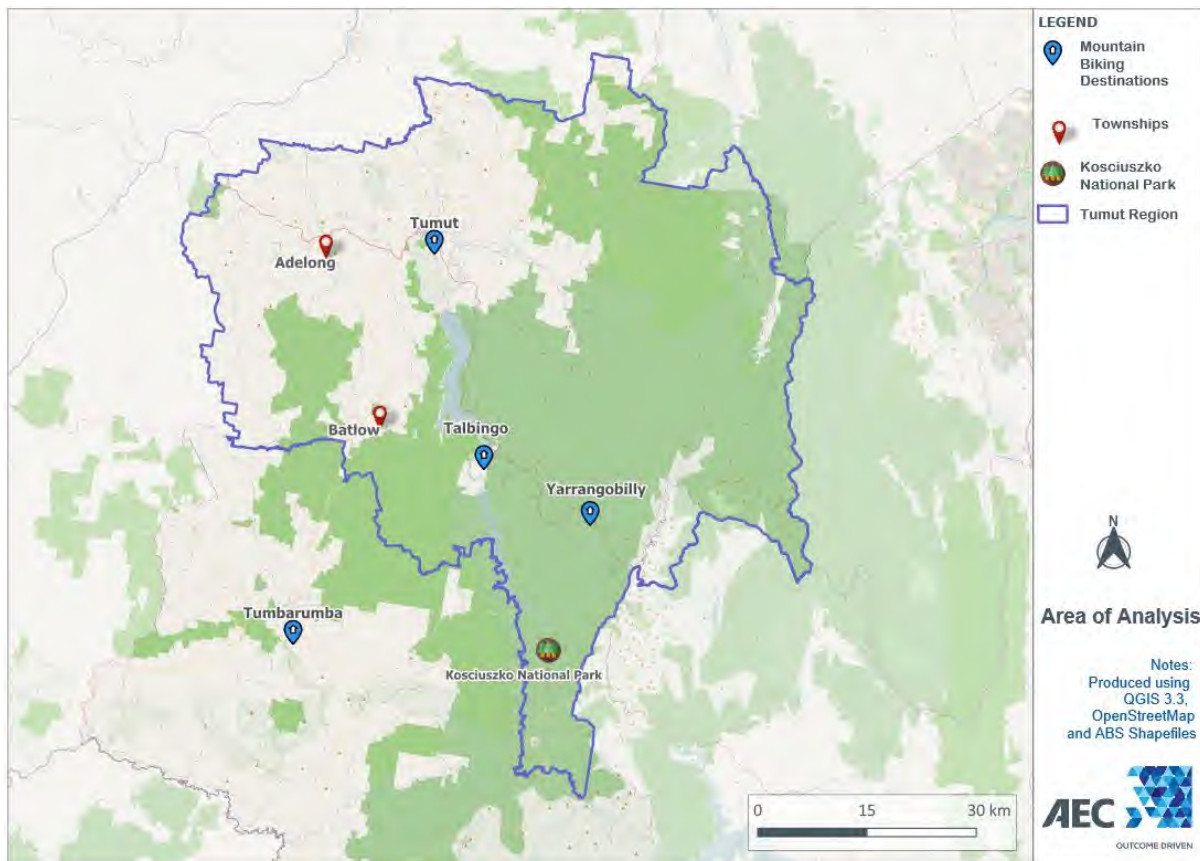
Visitor projections for the Tumut Region is not available, however, Tourism Research Australia projections at the State and National level can provide an indication of the direction of projected visitation growth in the region. In developing projections AEC has applied projected visitor growth for New South Wales to the estimate for 2019 to project future visitation in the region. It should be noted that visitation in the near term is expected to fall below that shown due to impacts from COVID-19, however, in the longer term this projection may be considered a reasonable expectation for visitor growth should tourism visitation growth return to pre-COVID-19 levels.

New South Wales tourism projections suggests:

- The domestic daytrip and overnight trip visitor markets will record the strongest growth to 2029 (5.3% per annum on average)
- The international visitor market will grow by 1.1% to 2029 (TRA, 2020a, 2020b, 2020c).

Based on this approach, total visitation is anticipated to reach approximately 481,400 people in the Tumut Region by 2029.

Figure 2.2. Tumut Region Map



Source: AEC.

3. PROJECT DESCRIPTION

3.1 PROPOSED INFRASTRUCTURE

To continue supporting economic and tourism outcomes in the region, Snowy Valleys Council are proposing to develop a network of MTB trails in and around Talbingo township and the greater area of Yarrangobilly, which consists of national parkland and the Yarrangobilly Caves. As outlined in the Master Plan (Natural Trails, 2020), the proposed Talbingo and Yarrangobilly MTB Trail Network (the project) will be positioned along the Big Talbingo Mountain, and will boast a continuous vertical descent along a single-track of 1,000 metres in elevation and 15 kilometres in length.

The Talbingo and Yarrangobilly MTB Trail Network is anticipated to become one of Australia's most popular mountain biking trail networks, due to housing the longest vertical descent along single-track in the nation. This will attract visitors from across the country and internationally, to experience the unique offering of the Talbingo and Yarrangobilly MTB Trail Network.

Specifically, the project development includes the following components:

- Talbingo Trail Network (approx. 51km)
- Yarrangobilly Trail Network (approx. 30km)
- Bridge crossings, trail features, and trail furniture
- Helicopter access pad
- Bike washing facilities
- Bike racks/ repair stands
- E-Bike charging stations
- Shuttle services
- Signage
- Picnic tables and chairs
- Small shelters
- Drop toilets
- Water points
- Unsealed carpark.

Figure 3.1. Talbingo and Yarrangobilly MTB Network Concept Plan



Source: Natural Trails (2020).

3.2 CAPITAL COSTS

3.2.1 Initial Capital Costs

Table 3.1 contains the projected capital costs associated with the development of the project. For modelling purposes, it has been assumed that the construction phase will occur between 2020-21 and 2023-24, with early works and professional services in the first half of 2021, followed by a two-year construction program between 2021-22 and 2022-23. Weed management and trail management in 2023-24 is included in the capital works program.

Table 3.1. Capital Costs

Cost Item	2020-21	2021-22	2022-23	2023-24	Total
Clearing and Trail Formation	\$0	\$1,840,000	\$1,840,000	\$0	\$3,680,000
Bridges	\$0	\$362,500	\$362,500	\$0	\$725,000
Underpass	\$0	\$225,000	\$225,000	\$0	\$450,000
Signage	\$0	\$100,000	\$100,000	\$0	\$200,000
Charging Stations	\$0	\$12,500	\$12,500	\$0	\$25,000
Raised Platforms	\$0	\$273,500	\$273,500	\$0	\$547,000
Rock Armour	\$0	\$23,000	\$0	\$0	\$23,000
Major Trailhead (Car Park)	\$0	\$350,000	\$0	\$0	\$350,000
Revegetation	\$0	\$61,000	\$61,000	\$0	\$122,000
Other Platforms	\$0	\$330,000	\$0	\$0	\$330,000
Site Establishment	\$20,000	\$0	\$0	\$0	\$20,000
Project Management	\$100,000	\$300,000	\$50,000	\$0	\$450,000
Rest Areas/ Trail Furniture	\$0	\$50,000	\$50,000	\$0	\$100,000
Charging System Set-Up Costs	\$0	\$0	\$50,000	\$0	\$50,000
Professional Fees	\$200,000	\$50,000	\$50,000	\$0	\$300,000
Construction Contingency	\$28,850	\$317,350	\$230,800	\$0	\$577,000
Weed Management	\$0	\$50,000	\$50,000	\$50,000	\$150,000
<i>Seed Funding</i>					
Capital Equipment	\$0	\$100,000	\$0	\$0	\$100,000
Trail Management	\$0	\$25,000	\$75,000	\$100,000	\$200,000
Total	\$348,850	\$4,469,850	\$3,430,300	\$150,000	\$8,399,000

Source: Natural Trails, TouchPoint One, AEC.

3.2.2 Capital Renewal

Post construction, periodic renewal of capital assets will be required as they reach the end of their useful life. The following table provides an overview of the anticipated asset life for key capital items.

Table 3.2. Capital Expenditure Type Useful Lives

Asset Type	Useful Life
Revegetation/ Weed Management	1 Year
Capital Equipment/ Charging Stations	10 Years
Trail Formation	20 Years
Built Infrastructure e.g. bridges, car park	20 Years
Underpass Construction	50 Years

Source: Natural Trails, Touchpoint One, AEC

The economic and financial modelling has been undertaken over a 20-year operational assessment period, and as such, capital replacement will be required for the charging stations and capital equipment over this period. Each of

these capital items have a useful life of 10 years, and as such, the economic and financial modelling has included capital replacement expenses in 2032-33 and 2033-34 to account for this, as summarised in the following table.

Due to the regular ongoing maintenance of the trail, including machine re-building works every five to ten years, a full replacement of the trail may not be necessary at the end of its useful life, therefore the full replacement cost may not be required to be funded by Council. Additional details regarding machine rebuilding works is provided in section 3.6.1.2.

Table 3.3. Capital Renewal Costs

Cost Item	2032-33	2033-34	Total
Charging Stations	\$12,500	\$12,500	\$25,000
Capital Equipment	\$100,000	\$0	\$100,000
Total	\$112,500	\$12,500	\$125,000

Source: Natural Trails, TouchPoint One, AEC.

3.3 RATIONALE FOR INVESTMENT

The Talbingo Township (and more broadly the Tumut Region and Snowy Valleys LGA) is heavily reliant on tourism activity to support local businesses and generate economic activity. Talbingo transitions from a summer tourism destination for water sport enthusiasts, bushwalkers, and grey nomads to a winter tourism destination for skiers, snowboarders, and adventure seekers. This enables the attraction of tourists almost year-round. Due to the heavy reliance of Talbingo on tourism related activity, however, the bushfires in late 2019 and early 2020 as well as the COVID-19 pandemic has had a significant impact on the economy.

The bushfires resulted in the closure of the Talbingo and Blowering Dams during peak summer tourism season in early 2020, whilst the Selwyn Ski Resort was also closed for the 2020 season. This has resulted in reduced tourism activity, reduced business activity (particularly for accommodation and retail businesses), reduced retention of residents, and lower economic activity. Economic activity was further impacted by the COVID-19 pandemic. Indicative estimates of the impact of COVID-19 to the Snowy Valleys LGA economy to 31 October 2020 has been developed based on data from the Australian Bureau of Statistics (ABS, 2020b)¹. These estimates suggest the pandemic resulted in a decline of approximately 200 employees (or 3.2%) in the Snowy Valleys LGA compared to 2018-19 estimates. GRP was estimated to decline by approximately \$21.6 million (or 2.4%). The project will assist in the attraction of visitation to the region throughout the year and aid the recovery the industry post bushfires and pandemic.

Historically, the Tumut Region's population has declined by 0.4% per annum on average between 2001 and 2019. Population projections suggest the resident population in the Tumut Region will continue to decline by 1.0% on average per annum to 2041. The broader Snowy Valleys LGA is anticipated to experience a similar trend. These projections are anticipated to be further reduced over the next few years, due to reduced migration resulting from the international travel ban implemented in March 2020 due to the COVID-19 pandemic. The project will assist in retention of the residential population of these regions due to the increased business activity, and enhanced livelihood.

In addition to the above need, there are various opportunities enabling the future success of the project, including:

- Leveraging existing adventure tourism synergies
- The proximity and suitability of mountain range
- Supplementing existing trails in the region which do not attract visitors
- Accessibility from Canberra and Melbourne
- Mountain biking is a high growth industry

¹ Employment impacts for the LGA were developed assuming the proportional change in industry activity at the State level have been experienced at the LGA level as well. Impacts on GRP were estimated assuming the value added per employee in 2018-19 holds constant.

- Specifically, the e-bike market is poised for high growth of 6.2% on average per annum between 2020 and 2025 (globally).

A market analysis for the project is presented in Appendix A, providing more detailed information supporting the need and opportunity for investment in the project.

3.4 ANTICIPATED IMPACTS OF THE PROJECT

The project will provide a range of socio-economic benefits to the local community. A summary of some of the anticipated benefits is outlined below.

Alternative Outdoor and Adventure Activity Experiences

The Snowy Valleys LGA, and in particular the Talbingo and Yarrangobilly region, offers a wide array of outdoor and adventure activities including (but not limited to) snow skiing, water sports such as wakeboarding, canoeing and kayaking, bushwalking and camping, and guided tours of the caves around the Yarrangobilly area. The primary drivers of visitation to the area are snow-skiing in winter, and water sports during the warmer months.

By developing world-class mountain biking trails and facilities, Snowy Mountains Council can provide an additional activity option for visitors during their stay in Talbingo/ surrounding areas to cater to a greater range of and meet the needs of other outdoor and adventure tourists, as well as providing an alternative activity option for visitors when weather is not conducive to undertaking the main activities (snow skiing, water sports).

Amenity Benefits for Users of the Mountain Bike Trails Network

Once operational, the Talbingo and Yarrangobilly MTB trail network will cater specifically to riders and users, delivering the longest vertical descent along a single-track in Australia. The trail is anticipated to become well-known for its unique offering, by national and international visitors alike. The close proximity of the Talbingo township to the trail network will also provide a significant benefit to users, with the trails easily accessible using existing bike paths.

The high-quality nature of the experience will deliver an important amenity and recreational benefit to users. In combination with the range of existing activities in the region, the MTB network will also act to improve the amenity provided by outdoor and adventure experiences across the region for both local and visiting users.

Increasing Visitor Demand and Length of Stay of Visitors

Provision of a high-quality MTB trail network will see the region leverage one of the fastest growing recreational sports markets in Australia, attracting additional visitors to the region. This will support and expand on the existing demand generated by snow-skiing in winter and water sports in summer, as well as other adventure and experience activities available throughout the year.

Supplementing the existing adventure and experience tourism offerings in the region will also provide for a greater diversity in activities and cater to a broad market of visitors. The confluence of these experiences will provide visitors with more options to fit within their schedule during their stay, which in turn will encourage tourists to stay longer to fit all of their desired activities into their stay.

Increasing the number of and length of stay of visitors will deliver increased visitor nights in the region, increased demand for accommodation, and increased overall visitor expenditure locally. Greater visitor expenditure is likely to be encouraged through more locals engaging in mountain biking, new visitors to the region, and encouragement of visitors who are anticipated to visit the region regardless of the project to partake in mountain biking activities. This will generate additional spend on bike hire, accommodation, food and beverage services, trail entry, and other ancillary services. Furthermore, local riders that are encouraged to join the sport will be required to spend on bikes and equipment in the local economy, with the average spend on new bikes an equipment equating to \$2,353 per person (Dirt Art, 2016).

Increasing Off-Peak Activity

The MTB network will provide a potential year-round adventure sport which has the potential to soften the high level of seasonality in visitor demand currently experienced, with peaks in summer and winter and limited demand

in-between. The shoulders of peak tourism periods will likely be extended, while increased visitation during off-peak periods will also be supported.

Encouraging visitation and increased length of stay in Talbingo during the off-peak period has the potential to support local business growth and development, whilst the development of community infrastructure and facilities can encourage further investment into the area. Increased visitation during the off-peak periods can also reduce the volatility of incomes for businesses throughout the year. In turn, this will provide greater stability for local jobs, increase business survivability rates, and reduce business owner stress.

Catalyst for Repeat Visitation

The development of the Talbingo and Yarrangobilly MTB Trail Network provides a catalytic opportunity that will provide both locals and visitors with greater awareness and access to the high quality outdoor and adventure experiences on offer in Talbingo and the broader region. It will significantly enhance the region as an adventure tourism destination by adding to the existing range of outdoor pursuits on offer.

By attracting visitors to the region for the MTB network, these trails will also open new visitors to the broad range of other adventure tourism offerings available in the region which will encourage repeat visitation. Similarly, visitors coming for existing experiences in the region will benefit from an additional alternative, enhancing their overall experience and thereby encouraging increased repeat visitation into the future.

Support Local Business and Jobs

The implementation of this project will provide stimulus to the Snowy Mountains region through increased expenditure, in construction for short-term and within the trails experience supply chain as well as tourism/ visitor related industries such as accommodation and food services in the long-run.

In both the construction and operational phases of the Talbingo and Yarrangobilly MTB Trail Network, there are notable economic and social benefits from increased business revenue opportunities and employment opportunities for local workers.

In addition to supporting local business and employment generation, the MTB network long-term presents an opportunity for businesses to develop products and services to meet the needs of trail users and day visitors to Talbingo, thereby supporting local business development and growth in various industries linked to tourism and trails experience activities beyond those already available. This could include transport, merchandise, accommodation, food and beverages, and other ancillary services. There are existing operators in the region that will also stand to benefit considerably from the increase in visitation. They are likely to capitalise on this opportunity and provide additional services, products, and experiences through cross-promotional packages for trail users.

The increase in demand from the MTB network will not just support tourism facing businesses. As investment in the town grows other, more permanent population focused businesses and services will also benefit. These businesses will provide increased provision of goods and services within the local economy, whilst supporting both existing and future residents of Talbingo and the surrounding areas.

Supporting Population Growth

The Snowy Valleys LGA has recorded a declining population since 2001 (recording a contraction of -0.2% per annum on average). This decline is anticipated to continue, with population projected to contract by -0.7% per annum on average outwards to 2041.

Investment in infrastructure to support smaller and seasonally volatile communities such as Talbingo can assist in attracting and retaining residents locally and support population growth longer-term in the Snowy Valleys region. Investment in tourism infrastructure that supports year-round visitation, such as the MTB network, will generate additional expenditure within the local economy and support local business opportunities. This has the potential to deliver the necessary growth to provide critical mass for a range of businesses and services.

Additional local jobs, investment in infrastructure and fully-utilised residential services will also improve the region's relative attractiveness to people potentially moving to Talbingo (and the Snowy Valleys) for work, as well as assist in retaining current local residents by providing additional job opportunities, career paths and greater business

confidence. This has the potential to deliver the necessary growth to provide critical mass for a range of population-based services, such as supporting the long-term operations of the Talbingo school that is currently under-utilised.

Population growth supported by stable visitation rates will also provide benefits to council in the form of additional rates revenue, generated by increased population and business growth. This in turn will assist in providing enhanced services across the local community.

Attraction of Investment

The increased visitor and business expenditure attracted to Talbingo, as well growing local community, can be expected to improve business and investor confidence in the region and thereby attract new investment into the township. Investment and expansion will also be required to meet growth in visitor demand during peak periods (e.g. for accommodation which is already at capacity). This investment will provide additional opportunities for business to support construction and expansion activities.

Improved Community Cohesion

Development of facilities that provide recreational and leisure activities to residents and act as nodes for community interaction and socialising are critical to enhancing community wellbeing and cohesion. As a central hub for outdoor and adventure activities, it is thereby anticipated that the MTB network will offer many social and cultural benefits to residents and visitors alike, as the MTB network will provide another centralised location for both locals and visitors to meet, congregate and partake in outdoor activities, particularly in off-peak periods. It would provide a safe, fun, and stimulating environment that could be enjoyed by all age groups across a range of demographics and participant activities.

3.5 PROJECTED DEMAND

The trails are anticipated to be developed and opened in a staged process over the two-year construction period between 2021-22 and 2022-23. It is likely that the trails will see some level of activity during 2021-22, however, usage is likely to be low in this year and primarily generated by local usage. To be conservative, operations activity has been assumed to commence in 2022-23.

A market analysis for the project is provided in Appendix A. Based on the findings of the market analysis, the following demand assumptions have been made for the project.

3.5.1 Trail Usage

3.5.1.1 Local Demand Assumptions

The project has the potential to increase the uptake of mountain biking as a sport for locals. Currently, New South Wales records approximately 35.3 MTB riders for every 1,000 people in the population, whilst Australia records approximately 41.8 MTB riders for every 1,000 people (ABS,2020; TRC, 2013, Clearing House for Sport, 2019). This indicates that New South Wales has significant potential for growth in terms of the local take-up rates of the sport. Assessment of other States, including the Australian Capital Territory (65.4 MTB riders per 1,000 people), further demonstrated the potential growth of the sport for New South Wales, and hence the Tumut Region.

Based on mountain biking participation rates at the state level across Australia as well as MTBA membership growth rates in recent years, three scenarios have been assessed in terms of local take-up rates for mountain biking in the Tumut Region. For these scenarios, given the uncertainty with regards to existing participation in the local community, different starting points in terms of existing participation have been applied as well as different growth rates:

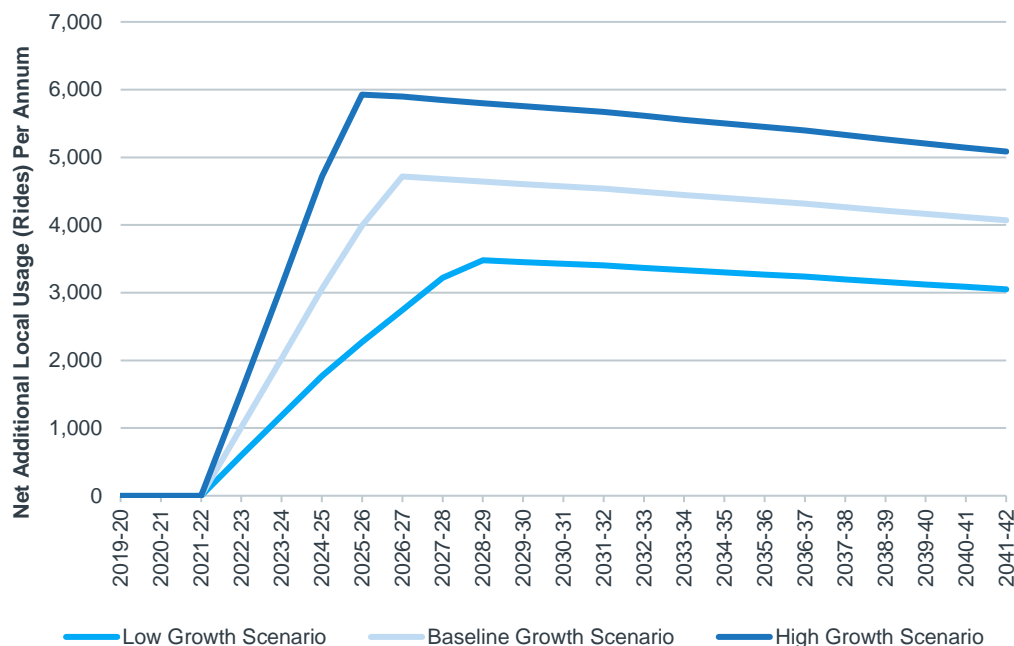
- **Low Growth Scenario:** In 2021-22 there are assumed to be 30.0 MTB riders per 1,000 people in the population. This has been assumed to grow by 4.6% per annum on average from the first year of operations (2022-23) to reach, and stabilise at, 37.5 MTB riders per 1,000 people in the population by 2028-29.
- **Baseline Growth Scenario:** In 2021-22, there are assumed to be 40.0 MTB riders per 1,000 people in the population. This has been assumed to grow by 5.7% per annum on average from the first year of operations (2022-23) to reach, and stabilise at, 50.0 MTB riders per 1,000 people in the population by 2026-27.

- **High Growth Scenario:** In 2021-22, there are assumed to be 50.0 MTB riders per 1,000 people in the population. This has been assumed to grow by 6.9% per annum on average from the first year of operations (2022-23) to reach, and stabilise at, 62.5 MTB riders per 1,000 people in the population by 2025-26.

As outlined in Appendix A, it has been assumed that local MTB riders undertake 2 rides per week on average, equating to approximately 130 rides per annum.

The estimated net additional local usage (rides) in the Tumut Region due to the project is presented in Figure 3.1.

Figure 3.1. Net Additional Local MTB Usage Per Annum, Tumut Region



Source:(ABS (2020), TRC (2013), Clearing House for Sport (2019).

3.5.1.2 Visitor Demand Assumptions

Minimal mountain biking visitation is currently recorded in the Tumut Region. The Project has the potential to increase visitation through encouraging greater participation in MTB activities for visitors that typically come to the region, as well as attracting new visitation to the region.

Case study analysis indicated that it is reasonable for the Project to result in increased cycling visitation of between approximately 15,000 and 25,000 visitors. It has been assumed that 75% of this related to MTB activities. This has been modelled under three scenarios for the **project case**:

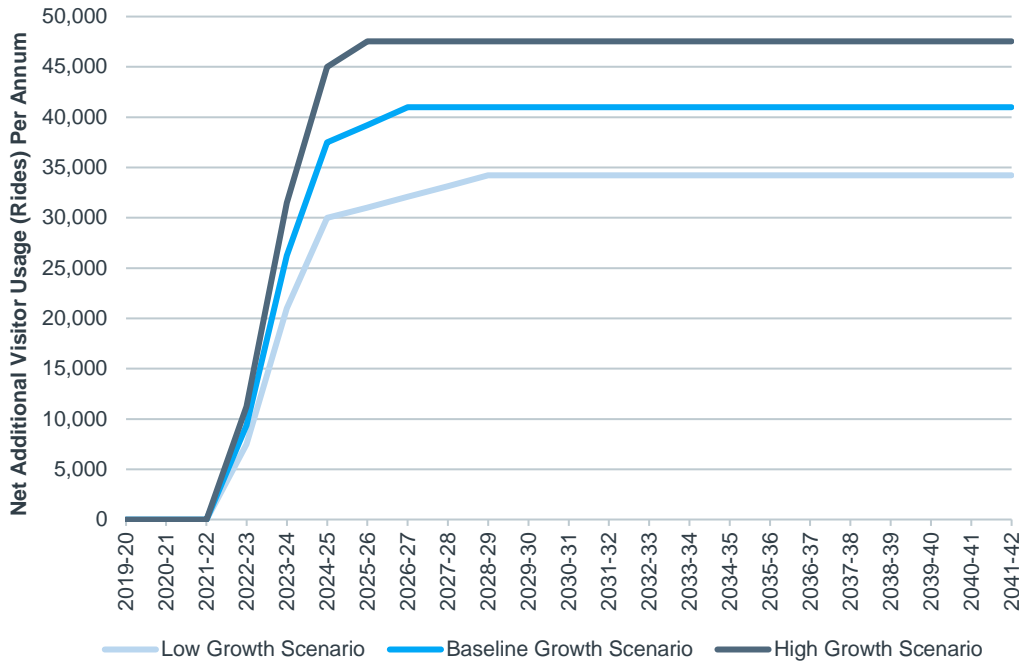
- **Low Growth Scenario:** 15,000 additional MTB visitors per annum by year three of operations, with 25% achieved in 2022-23, increasing to 70% in 2023-24 and 100% in 2024-25. MTB visitation is then expected to trend 25% below projected visitation growth from 2024-25 until 2028-29 where it is anticipated to stabilise.
- **Baseline Growth Scenario:** 18,750 additional MTB visitors per annum by year three of operations, with 25% achieved in 2022-23, increasing to 70% in 2023-24 and 100% in 2024-25. MTB visitation is then expected to trend in line with projected visitation growth from 2024-25 until 2026-27 where it is anticipated to stabilise.
- **High Growth Scenario:** 22,500 additional MTB visitors by year three of operations, with 25% achieved in 2022-23, increasing to 70% in 2023-24 and 100% in 2024-25. MTB visitation is then expected to trend 25% above projected visitation growth from 2024-25 until 2025-26 where it is anticipated to stabilise.

It has been assumed that 55% of the visitor increase are daytrip visitors; these visitors are expected to be primarily those travelling from Canberra and Melbourne to the trails. Domestic overnight visitors have been assumed to represent 40% of the visitor increase, and international representing 5%. Previous research indicates that domestic

overnight visitors undertake between 2-5 rides per trip (3 assumed), whilst international visitors have been assumed the undertake 5 rides per trip, and domestic daytrip visitors just 1 ride (TRC Tourism, 2015, TRC Tourism, 2019).

Additional visitor usage (rides) in the Tumut Region has been demonstrated in Figure 3.2; this represents the net additional usage due to the project case compared to what would be expected to occur without the project.

Figure 3.2. Net Additional Visitor MTB Usage Per Annum, Tumut Region

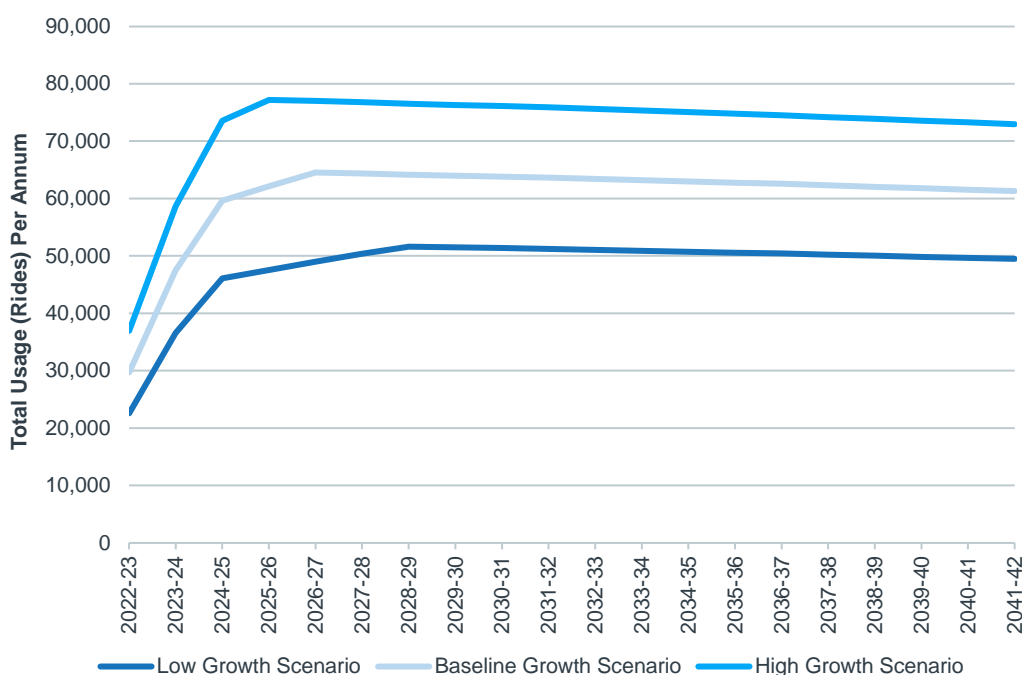


Source: TRC Tourism (2015) TRC Tourism (2019), TRA (2020a, 2020b, 2020c).

3.5.1.3 Overall Demand Outcomes

Total trail usage (including local and visitor usage) is anticipated to reach between approximately 22,500 (low growth) and 37,000 (high growth) rides per annum in 2022-23 and grow to between approximately 49,400 (low growth) and 73,000 (high growth) rides per annum by 2041-42. The overall demand outcomes decline from 2030-31 to 2041-42 due to visitation demand stabilising whilst local demand declines slightly with the projected population decline.

Figure 3.3. Total Usage (Rides) Per Annum, 2022 to 2030



Source: TRA (2020a, 2020b, 2020c), TRC (2013).

3.5.2 Increased Visitation and Visitor Nights

The project has the potential to increase visitation and visitor spend in the following ways:

- Increase the length of stay associated with visitors who are anticipated to visit the region regardless of the project, who would now undertake mountain biking activities due to the project. This represents the non-core market, which includes those whereby mountain biking is not a primary motivator or sole purpose of travel, rather it is a complementary activity (see Appendix A for detail).
- Result in new visitation and visitor nights to the region solely for mountain biking purposes. This represents the core market which includes those who travel for the sole purpose of mountain biking at the destination. This market continually seeks out new and exciting destinations, and typically travels multiple times a year for mountain biking purposes (see Appendix A for detail).

It has been assumed that visitors who are anticipated to visit the region regardless of the project represent 40% of the total visitors using the trails, whilst new visitors represent 60% of the visitors using the trails.

In estimating the net **new visitor** days/ nights generated as a result of the project, it has been assumed that:

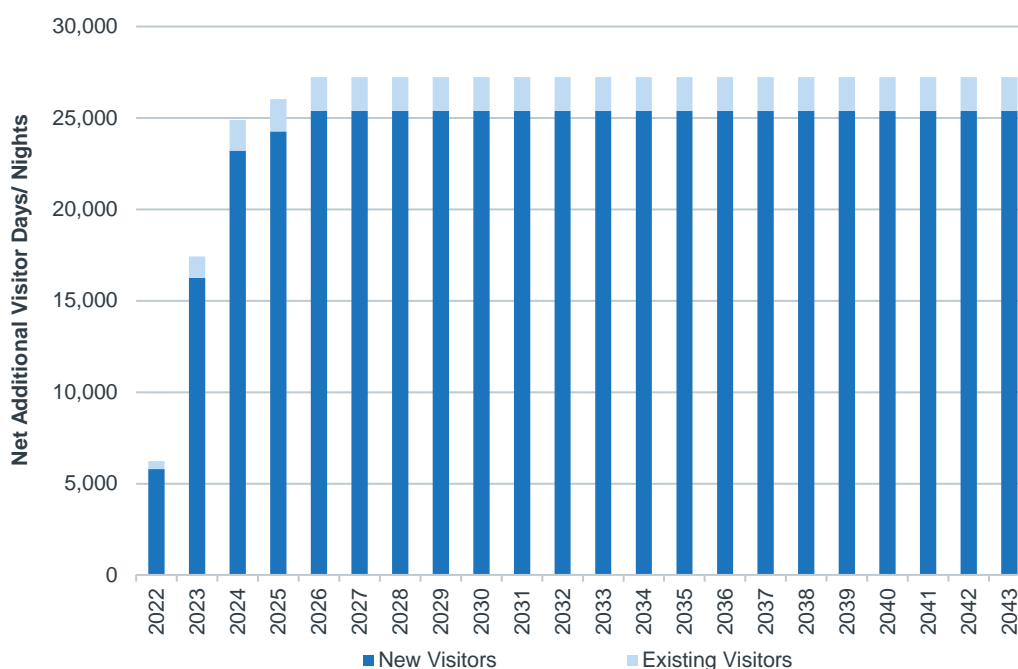
- Domestic daytrip visitors stay for one day per trip
- Domestic overnight visitors on a medium-long length holiday (assumed to represent 40% of total domestic overnight visitors) stay for 5 nights per trip
- Domestic overnight visitors on a weekend holiday (assumed to represent 60% of total domestic overnight visitors) stay for 2 nights per trip
- International visitors stay for 7 days per trip.

In estimating the net **existing** visitor days/ nights generated as a result of the project, it has been assumed that:

- Daytrip visitors will not extend their stay (i.e. no transfer from daytrip visitors to overnight visitors)
- Domestic overnight and international visitors will stay for an additional 0.5 nights on average.

The following graph depicts the estimated total additional visitor days/ nights generated as a result of the project.

Figure 3.4. Net New Visitor Days/ Nights



Source: TRA (2020a, 2020b, 2020c), TRC (2013).

3.6 OPERATIONS ACTIVITY

Once operational, the Talbingo and Yarrangobilly Trail Network is expected to support ongoing activity through the following avenues:

- Facility operating activity, i.e., operating activity from trails management and maintenance.
- Operating activity from ancillary supporting services. It is anticipated the project will provide an opportunity for a shuttle service provider to transport passengers and equipment to the top of Big Talbingo, while the project will also provide significant opportunities for bike hire and related activity.
- Increased visitation and visitor expenditure in the local economy.

These are examined in more detail in the following sections.

3.6.1 Facility Operating Activity

3.6.1.1 Revenue Projections

The facility is anticipated to generate revenue through two primary sources:

- Trail access fees, captured through:
 - Shuttle service fees
 - Competition/ event fees.
- Sponsorship/ donation contributions.

Trail Access Fee

A nominal user access fee has been assumed to be levied to generate revenues to support the ongoing management and maintenance of the trails. This access fee will be charged on users of the shuttle service as well as competition/ event entrants, levied and collected through the shuttle service provider and competition/ event organisers. Aside from this, it has been assumed that the trails are free to use for regular riding.

A trail access fee of \$1.50 has been assumed to be captured through the shuttle service, levied and collected through the shuttle service provider. The approach for estimating the number of users of the shuttle service is outlined in section 3.6.2.1.

Stromlo Forest Park (Stromlo) typically attracts 150,000 visitors per annum, the majority of which represents mountain biking visitation. The Canberra Mountain Biking Report (2019) indicates that Stromlo attracts around 200 events per annum, with between 200 to 400 (300 assumed) participants per event. Assuming 75% of total visitation to Stromlo represents mountain biking activity, this equated to event participation comprising approximately 53.3% of total visitation. To be conservative, it has been assumed that the project will generate event participation of two thirds of this share (approximately 35%). This has been applied to local usage and the core mountain biking market usage only. This level of event participation equates to approximately 50 events held on average per annum at the project site (under the baseline growth scenario). A trail access fee captured through competition/ event fees of \$2.00 per head has been assumed, in line with that charged at Stromlo, Canberra.

Sponsorship/ Donations

Sponsorship contributions have been assumed equal to \$20,000 in the first year of operations and increasing to \$25,000 by 2027-28. This has been based on sponsorship revenue received for the maintenance/ upgrade of trails in Jindabyne.

Revenue from donations was estimated assuming 10.0% of local users will donate approximately \$10.00 per annum on average (or 0.49 cents per ride on average for these locals under the baseline growth scenario), and 4.0% of the core mountain biking visitor market (i.e. new visitors) will donate approximately \$10.00 per annum (or 0.18 cents per ride on average for these visitors under the baseline growth scenario). This equates to total revenue through donations of approximately \$1,000 in the first year of operations which increases in line with demand to approximately \$4,300 by 2028 (under baseline growth assumptions).

This level of revenue through donations is considered feasible as it is considerably lower than the willingness to pay of mountain bike trail users to access trails per ride of \$3.64, identified through previous research (RMCG, 2019).

3.6.1.2 Operating Costs

Operating and maintenance costs associated with the project include employee costs, annual corridor pruning, machine rebuilding works, insurances, equipment, marketing and promotion, consultants, equipment and materials, maintenance, and replacement costs. Estimates of operating expenses have been developed based on the experience of other newly established MTB trails.

Operating expenses to 2024-25 have been summarised in Table 3.4 below. Some initial management and maintenance costs are covered through the seed funding between 2021-22 and 2023-24. Operating expenses have been estimated to remain the same from 2024-25 onwards.

Table 3.4. Trail Network Operating Costs Per Annum (All Scenarios)

Cost Item	2020-21	2021-22	2022-23	2023-24	2024-25
Staffing Costs (Trail Maintenance/ Management)	\$0	\$0	\$0	\$0	\$25,000
Annual Corridor Pruning	\$0	\$0	\$0	\$0	\$10,000
Consultants/ Sub-Contractors	\$0	\$0	\$0	\$0	\$10,000
Insurance	\$0	\$5,000	\$5,000	\$5,000	\$5,000
Marketing and Promotion	\$0	\$7,500	\$7,500	\$7,500	\$7,500
Equipment and Materials	\$0	\$0	\$0	\$0	\$5,000
Maintenance of Charging Stations	\$0	\$0	\$250	\$500	\$500
Total	\$0	\$12,500	\$12,750	\$13,000	\$63,000

Notes: It is assumed marketing and promotion activities will also be undertaken by Destination NSW Riverina-Murray as part of their existing annual marketing activities for the region.

In addition to regular ongoing maintenance works, the MTB trails are expected to periodically require machinery (including trail dozers, excavators, and trucks) for larger scale rebuilding/ maintenance of the trails. The exact timing and quantum of works may vary depending on a range of factors, including the extent of usage, rate of

degradation and impacts from environmental conditions, but is likely to be needed approximately every 5 to 10 years. Therefore, in addition to the costs displayed in Table 3.4, periodic machine rebuilding works of the trails has been included every 5 to 10 years at an estimated cost of \$35,000 per annum, with works assumed to be undertaken over three years. For modelling this has been assumed to occur between 2027-28 to 2029-30 and 2037-38 to 2039-40.

3.6.2 Ancillary Operating Activity

As indicated in section 3.4, the project is anticipated to support local business and encourage the creation of new businesses, including those in transport, merchandise, accommodation, food and beverages, and other ancillary services. Two primary opportunities are anticipated to be supported by mountain bike users:

- A shuttle service provider. Mountain bike shuttle services can be in the form of a bus or buggy, which transports riders via fire trails and access roads to the top of the mountain. This allows riders to experience the full descent, without the need to ride uphill.
- Bike hire services, either run by private operators in town or on-site.

3.6.2.1 Shuttle Service

Demand for/ usage of a shuttle service was estimated using the Australian Mountain Bike Market Profile Survey (2016), which indicated that 28% of riders use shuttle/ chairlift services occasionally on rides, whilst 6% of riders use shuttle/ chairlift services regularly on rides. The 28% of riders that use a shuttle/ chairlift service occasionally on rides are assumed to do so on 30% of their estimated rides, whilst the 6% of riders that use a shuttle/ chairlift service regularly on rides are assumed to do so on 70% of their rides. Once applied to trail usage estimates, this equated to approximately 3,700 shuttle uses in the first year of operations, increasing to approximately 8,000 by 2030-31 under the baseline growth scenario.

The fee for using the shuttle service has been assumed to be approximately \$75 per use. This is assumed to be inclusive of the trail access fee as well as a national park day pass access fee. The Kosciusko National Park charges an entrance fee of \$16.00 per day, which visitors to the trail network are required to pay to access the trails. This money remains in the National Park Service and is often re-injected into maintenance and upkeep of the specific national park where the fee was collected. The fee for shuttle services utilised in modelling should, therefore, exclude the \$1.50 access fee as well as the \$16.00 national park day pass access fee. The net revenue to the shuttle service provider (excluding these fees) is thereby estimated to be \$57.50 per user.

3.6.2.2 Bike Hire

In estimating the expenditure on bike hire services, conservative assumptions have been made surrounding the activity anticipated for a bike store that the project is anticipated to create. These assumptions include:

- A fee per hour of \$30
- 15 bikes available for hire each day
- Bike hire services available for 7 hours per day (assuming the store is open from 9am to 4pm)
- A take-up rate per day of 25% of bikes on average (assuming weekends have nearly full take-up and other days of the week have a lower take-up)
- The trail network is open 280 days per annum (or 40 weeks in the year) to account for weather interruptions, unplanned events, etc.

The above assumptions result in a total number of bike hire hours per annum of 7,350 for the bike store, and when applied to the \$30 access fee this equates to \$220,500 in bike hire revenue. This level of expenditure on bike hires has been assumed to be reached when demand reaches its peak, which is achieved in different years for each of the scenarios assessed (see Figure in section 3.5.1.3). In the years prior to and following when this peak expenditure is reached, expenditure on bike hire has been assumed to track demand growth. This demand growth has been scaled down by 25% for the low growth scenario and up by 25% for the high growth scenario, relative to the baseline growth scenario.

3.6.3 Visitor Expenditure

As outlined in section 3.5.2, the project is anticipated to:

- Increase the length of stay associated with visitors who are anticipated to visit the region regardless of the project, who would now undertake mountain biking activities due to the project.
- Result in new visitation and visitor nights to the region solely for mountain biking purposes.

Visitor expenditure has been assumed in line with the typical domestic daytrip, domestic overnight, and international visitor expenditure profile to the Snowy Valleys LGA in 2018. The average day/ night expenditure per visitor broken down by type is outlined below:

- Domestic daytrip - \$76
- Domestic overnight - \$285 (including \$160 on accommodation)
- International - \$113 (including \$56 on accommodation).

Based on these assumptions and those in section 3.5.2 (outlining the induced visitation and visitor nights associated with the project), the overall induced visitor expenditure in the region due to the project is approximately \$2.5 million in the first year of operations (under the baseline growth scenario), which continues to grow in line with demand.

Expenditure has been broken down by item/ industry based on the Tourism Research Australia expenditure by item shares at the national level (with the shares modified slightly to reflect the typical spend on accommodation in the Snowy Valleys LGA), and expenditure items then allocated to the most relevant industries in the Input-Output model. Expenditure on flights has been excluded from the allocation, as this expenditure does not occur in the Snowy Valleys LGA. Expenditure on sports and recreation, gambling, and rental and hiring services has been assumed to already be captured in the estimated of ancillary operating activity in section 3.6.2, therefore, has been excluded. The table below provides the breakdown used to allocate expenditure across item/ industry for each visitor type.

Table 3.5. Expenditure by Industry Shares

Expenditure Shares by Industry	Domestic Day	Domestic Overnight	International
Air and Space Transport	0.0%	0.0%	0.0%
Road Transport	0.3%	0.3%	0.4%
Rail Transport	0.1%	0.0%	0.1%
Water, Pipeline and Other Transport	0.5%	2.8%	4.6%
Accommodation	0.0%	56.1%	49.6%
Food and Beverage Services	29.1%	16.4%	11.4%
Retail Trade	56.3%	17.6%	12.6%
Personal Services	2.5%	0.4%	1.1%
Heritage, Creative and Performing Arts	1.3%	0.8%	0.5%
Sports and Recreation	0.0%	0.0%	0.0%
Gambling	0.0%	0.0%	0.0%
Postal and Courier Pick-up and Delivery Service	2.5%	0.4%	0.7%
Rental and Hiring Services (except Real Estate)	0.0%	0.0%	0.0%
Automotive Repair and Maintenance	1.0%	0.1%	0.0%
Primary and Secondary Education Services (incl Pre-Schools and Special Schools)	0.1%	0.0%	2.0%
Technical, Vocational and Tertiary Education Services (incl undergraduate and postgraduate)	0.3%	0.1%	10.1%
Arts, Sports, Adult and Other Education Services (incl community education)	0.1%	0.0%	2.8%

Source: TRA (2020c)

4. COST BENEFIT ANALYSIS

4.1.1 Method & Approach

This assessment provides an overview of the net economic costs and benefits associated with the project between the years 2020-21 and 2041-42 (20-year operational analysis to reflect the useful life of the majority of the built infrastructure). The costs and benefits have been assessed against three real discount rates (4%, 7% and 10%) with the focus of reporting on the standard 7% discount rate.

As real discount rates are used, all values presented are in real dollar terms, and do not include inflation.

The geographical scope of the project impact is within the Snowy Valleys LGA. Costs and benefits assessed in this analysis relate to this catchment.

Cost benefit analysis compares the project case to a base case or business as usual scenario in which the project does not proceed. In undertaking the cost benefit analysis, the following is noted regarding the base case and project case scenarios compared in this assessment:

- **Base Case:** Which assumes the project does not proceed and associated costs and revenues are not delivered. Without the project, the local participation rate in MTB activities is assumed to hold steady, with local demand declining year on year with the population decline. Without the project, visitor demand is assumed to remain highly seasonal and reliant on water and snow-based activities, and continue as per current trends. The anticipated lift in local trail usage, visitor days/ nights in the region, and other benefits outlined in section 3 are not achieved.
- **Project Case:** Which assumes the project proceeds, with construction, demand and operating activity as outlined in section 3. In this scenario the project stimulates additional visitation, recreational use, rider amenity, health benefits, and induced expenditure.

Decision Criteria:

The Net Present Value (NPV) and Benefit Cost Ratio (BCR) will be the primary decision criteria for the economic appraisal. The NPV of a project expresses the difference between the present value (PV) of future benefits and PV of future costs, i.e.: $NPV = PV \text{ Benefits} - PV \text{ Costs}$. The BCR provides the ratio between the PV of benefits and PV of costs, i.e., $BCR = PV \text{ Benefits} / PV \text{ Costs}$.

Where the economic appraisal results in a:

- Positive NPV and BCR above 1: the project will be deemed as being desirable.
- NPV equal to zero and BCR of 1: the project will be deemed neutral (i.e., neither desirable nor undesirable).
- Negative NPV and BCR below 1: the project will be deemed undesirable.

The Internal Rate of Return (IRR), which indicates the discount rate which would return an NPV of \$0 and a BCR of 1, is also reported.

Additional details regarding the approach used for this cost benefit analysis is presented in Appendix C.

4.1.2 Costs and Benefits

The following assumptions have been used in assessing the costs and benefits of the project. For costs, only the impacts associated with the initial capital outlay and operations, environmental impact, and increase in injuries due to the proposed project are examined. For benefits, only the impacts associated with the operations of the facility, shuttle and bike hire services, induced visitor and local spend, and amenity and health benefits for residents is examined.

Modelling has not included benefits of labour engaged during operations which is a conservative assumption in consideration of the impacts from COVID on the domestic and regional labour market which may be felt for many years.

4.1.2.1 Costs

Capital Costs

As in section 3.2, the project is estimated to cost approximately \$8.4 million to construct. For this analysis, works are assumed to be undertaken between 2020-21 and 2023-24. As the useful life of the project's capital equipment and charging stations is 10 years, an additional \$0.1 million has been assumed in 2031-32 and an additional \$0.01 million in 2032-33 and 2033-34 to cover the replacement costs for these items (as per section 3.2).

Operating Costs

Operating and maintenance costs associated with the project include employee costs, annual corridor pruning, machine rebuilding works, insurances, equipment, marketing and promotion, consultants, equipment and materials, maintenance, and replacement costs. Operating expense estimates have been assumed in line with that presented in section 3.6.1.

Environmental Impact

The establishment of the project will involve land clearing and the construction of trail infrastructure (including bridges, signage, charging stations, raised platforms, rock armour, and rest areas/ trail furniture). This will occur over an anticipated net new trail length of 71.6km with a width of 2m. This equates to approximately 0.14km² (or 14.32 hectares) of land that will be impacted and cleared by the project.

Constanza et al (2014) identified the global value of temperate/ boreal forest landscape (the most similar environment available for the purposes of this project) is equal to \$3,137 in value per hectare in 2011 dollars. Converting this to a 2020-dollar value indicates a total impact of \$53,162 across the 14.32 hectares per annum. In line with construction activity, it has been assumed that 50% of this impact occurs in 2021-22 and 100% each year thereafter until the end of the assessment period.

The review of environmental factors for the project indicated that no established trees will be removed (aside from those that present hazardous), clearing will be limited to small bushes/ shrubs only, and there will be negligible impacts to existing fauna. As such, it is likely that this estimation process has resulted in overestimating the environmental impact, however, has been utilised to remain conservative in the assessment approach.

Injuries

Mountain biking is an inherently dangerous sport, with possibilities of minor to severe injuries. Most mountain bikers that have participated in surveys across various studies have reported some history of previous injuries; with studies at mountain bike races indicating an injury rate of greater than 1% of participants (Kronisch, Pfeiffer, 2002). A variety of factors can be associated with injuries, including riding errors, lack of upper body strength, the style of riding undertaken, behavior (lack of attention, loss of control, indecisiveness, overestimation of ability), and trail conditions.

Transport for New South Wales (2019) indicates an appropriate average value associated with cycling injuries is approximately \$0.28 per kilometre travelled. Assuming the average length of each ride is approximately 20 kilometers, this equates to a total injury cost of between approximately \$44,800 (low growth scenario) and \$70,900 (high growth scenario) in the first year of operations (2022-23) which continues to increase year on year with trail usage across the remainder of the assessment period.

4.1.2.2 Benefits

Facility Revenue

Facility revenue will arise from the trail access fee (captured through the shuttle service and competition/ event fees) and sponsorship/ donation contributions. Facility revenue has been estimated as per section 3.6.1. Together, the trail access fee and sponsorship/ donation contributions result in between approximately \$28,000 (low growth

scenario) and \$32,700 (high growth scenario) in facility revenue in the first year of operations. This continues to increase year on year with trail usage over the assessment period.

National Park Pass Revenue

The Kosciusko National Park (which charges an entrance fee of \$16.00 per day) covers the trail network. As per section 3.5.1, trail usage has been split between local users, visitors who are anticipated to visit the region regardless of the project that may now use the trail network during their stay, and new visitors that travel to Talbingo due to the trail network. In terms of the national park access fee for these visitors, it has been assumed that:

- Locals will already be paying this, so it has been assumed there is no additional expenditure on this component by locals because of the new trail network. It is likely they would have an annual pass and can access the national park as much as they like.
- 50% of visitors who are anticipated to visit the region regardless of the project, who are encouraged to participate in mountain biking activities due to the project, will pay the access fee each riding day, as it is likely some of these visitors would travel to the National Parks during their visits for hiking and other activities and will transfer this activity to mountain biking due to the project.
- 100% of new visitors will pay the access fee each riding day.

Applying the \$16.00 per day entrance fee to the share of visitor riding days suggested above, the total revenue benefit from the National Parks pass is between approximately \$96,000 (low growth scenario) and \$144,000 (high growth scenario) in the first year of operations. This continues to increase year on year with trail usage over the assessment period.

Shuttle Service Producer Surplus

Revenue estimates for the shuttle service provider have been estimated as per section 3.6.2.1. The provision of goods and services is not costless, and only the producer surplus has been included as a net benefit. Once removing the cost of providing these goods and services, the retained producer surplus is anticipated to reach between approximately \$21,500 (low growth scenario) and \$35,300 (high growth scenario) in the first year of operations and grow with demand thereafter.

Bike Hire Producer Surplus

Revenue estimates from bike hire have been estimated as per section 3.6.2.2. As when calculating the shuttle service producer surplus, only the producer surplus has been included as a net benefit. Once removing the cost of providing these goods and services, the retained producer surplus is anticipated to reach approximately \$24,700 when demand growth reaches its peak (this varies by demand scenario). In the years prior to and following when the peak is reached, the producer surplus has been assumed to track demand growth. This demand growth has been scaled down by 25% for the low growth scenario and up by 25% for the high growth scenario, relative to the baseline growth scenario. This full amount has been modelled each year from commencement of operations in 2022-23.

Benefits from Induced Visitor Spend

Visitor Spend has been estimated as per section 3.6.3, indicating the overall induced visitor expenditure in the region due to the project is approximately \$2.0 million in the first year of operations, which continues to grow in line with demand. However, the provision of goods and services to visitors is not costless, and only the producer surplus has been included as a net benefit. Once removing the cost of providing these goods and services, the retained visitor spend net benefit is approximately \$0.25 million in the first year of operations, continuing to grow with demand. This full amount has been modelled each year from commencement of operations in 2022-23.

Health Benefit

Physical activities (such as mountain biking) support better health of individuals and reduce the risk of some diseases and chronic conditions, resulting in increased life expectancy and productivity (Hartog et al, 2010). According to the Australian Transport Assessment and Planning Guidelines (2018), the monetary value of the health benefits of cycling in 2020 dollars is \$1.58 for Australian adults aged 18 years and older. Transport for New

South Wales (2020) estimates the value of health benefit per kilometer of cycling is approximately \$1.24. The average of these two value estimates was utilised. It was assumed that 75% of riders receive this health benefits, due an assumed 25% transfer of activity from other physical exercise or other riding locations. It was assumed that the average length of a ride is 20 kilometers, which was applied to net new local and visitor rides in the region due to the project. This resulted in a total benefit of \$0.17 million in the first year of operations, which continues to grow with demand.

Underpass Residual Value

Residual value refers to the value of infrastructure at the end of its project lifetime and the value that the asset generates from then on. The two underpasses that are to be developed for the project have an estimated useful life of approximately 50 years. As the assessment period of the Cost Benefit Analysis is only carried out for the first 20 years of facility operations, there will be a residual value for this infrastructure component. The straight-line method was utilised to estimate the residual value of the underpasses, which assumes that capital costs incurred are depreciated at a constant rate during the estimated asset life for the whole project without discounting. The residual value for the two underpasses was estimated at approximately \$0.3 million in total.

4.1.2.3 Costs and Benefits Not Included

The project has the potential to deliver a range of other potential benefits, as identified in section 3.4, but not all benefits were able to be included in the cost benefit analysis due to data limitations to quantify and value these benefits. Some key benefits that have been excluded from the analysis include:

- **Amenity Benefit for Users:** An explicit amenity benefit has not been included in the cost benefit analysis (though is examined later in sensitivity testing), though research has previously identified a willingness to pay to access MTB trails of \$3.64 per use. While this is more than the trail access fee, an additional amenity benefit is excluded to be conservative on the basis that the access fee and national park pass reflects the minimum users are willing to pay, and health benefits are included which would partially be captured by a willingness to pay approach.
- **Environmental Benefit:** The weed management program, which will be undertaken over the 2022-23 to 2024-25 period, will assist in weed control in the area. This is anticipated to provide an environmental benefit in terms of reduced spread of invasive weeds in the national park, and offset some of the environmental impact cost caused by land clearing.
- **Employment Benefits:** The project will likely generate further employment due to additional labour engaged during operations, particularly related to labour required to serve the increase visitor spend, increased spend on bike hire, and increased spend on shuttle services in the local economy.
- **Catalyst for Business Investment and Growth:** The project will attract visitors and expenditure to the region which presents an opportunity for businesses to invest and grow. In particular this will present tourism-facing business opportunities, but as investment in the town grows other, opportunities for more permanent population focused businesses and services will also arise.

4.1.3 Cost Benefit Assessment

4.1.3.1 Summary of Results

The table below outlines the present value (PV) of the identified costs and benefits associated with the project between the 2020-21 and 2041-42 (20-year operational analysis), at discount rates of 4%, 7% and 10%. The CBA modelling for the project indicates that at all discount rates assessed the project is economically desirable for Snowy Valleys LGA, with the following results for the baseline growth scenario:

- A Net Present Value (NPV) of \$12.1 million over the 20-year operational assessment period with aggregated present value (PV) benefits of approximately \$23.1 million compared to an aggregated PV costs of approximately \$11.0 million (under the baseline growth scenario).
- A Benefit Cost Ratio (BCR) of 2.11, highlighting that the project is highly economically desirable under the CBA modelling assumptions, returning \$2.11 for every dollar cost (under the baseline growth scenario).

The cost benefit analysis identifies that the project is highly economically desirable at all discount rates, with the benefits outweighing the costs. The BCR ranges between 2.51 (4% discount rate) and 1.79 (10% discount rate).

Table 4.1. Summary CBA Results, Baseline Demand Scenario

Factor	Total Value (\$M)	PV (\$M) -4% Discount Rate	PV (\$M) -7% Discount Rate	PV (\$M) -10% Discount Rate
Costs				
Capital Expenditure	\$8.4	\$7.9	\$7.6	\$7.3
Operational Expenditure	\$1.3	\$0.8	\$0.6	\$0.4
Environmental Impact	\$1.1	\$0.7	\$0.6	\$0.4
Injuries	\$4.7	\$3.0	\$2.2	\$1.7
Total Costs	\$15.5	\$12.5	\$11.0	\$9.9
Benefits				
Facility Revenue	\$1.4	\$0.9	\$0.7	\$0.5
National Park Pass Revenue	\$9.8	\$6.3	\$4.6	\$3.5
Bike Hire Producer Surplus	\$0.5	\$0.3	\$0.2	\$0.2
Shuttle Service Producer Surplus	\$1.2	\$0.7	\$0.6	\$0.4
Benefit from Induced Visitor Expenditure	\$18.0	\$11.4	\$8.5	\$6.5
Health Benefit	\$17.9	\$11.4	\$8.5	\$6.5
Underpass Residual Value	\$0.3	\$0.1	\$0.1	\$0.0
Total Benefits	\$49.1	\$31.2	\$23.1	\$17.6
Summary				
Net Present Value (NPV)	-	\$18.8	\$12.1	\$7.8
Benefit Cost Ratio (BCR)	-	2.51	2.11	1.79

Note: Totals presented in the table may not equal the sum of costs and benefits due to rounding.
Source: AEC.

4.1.4 Sensitivity Analysis

4.1.4.1 Growth Scenarios

The CBA results in section 4.1.3.1 have been presented for the baseline growth scenario, however, a low and high growth scenario has also been assessed to account for demand surpasses or not meeting expectations. The table below demonstrates the result of these scenarios, and demonstrates that the project still generates a net economic benefit under the low growth scenario.

Table 4.2. Summary CBA Results Under Low and High Demand Scenarios

Factor	Total Value (\$M)	PV (\$M) -4% Discount Rate	PV (\$M) -7% Discount Rate	PV (\$M) -10% Discount Rate
Low Growth Scenario				
Total Costs	\$14.6	\$11.9	\$10.5	\$9.5
Total Benefits	\$40.5	\$25.6	\$18.9	\$14.4
Net Present Value (NPV)	-	\$13.8	\$8.4	\$4.9
Benefit Cost Ratio (BCR)	-	2.16	1.80	1.51
High Growth Scenario				
Total Costs	\$16.3	\$13.0	\$11.4	\$10.2
Total Benefits	\$57.3	\$36.5	\$27.1	\$20.7
Net Present Value (NPV)	-	\$23.5	\$15.7	\$10.5
Benefit Cost Ratio (BCR)	-	2.81	2.38	2.03

Note: Totals presented in the table may not equal the sum of costs and benefits due to rounding.
Source: AEC.

4.1.4.2 Other Key Parameters and Assumptions

Sensitivity analysis in this section has been undertaken using a Monte Carlo analysis across the other key parameters and assumptions used in the CBA modelling under the baseline growth scenario.

Each of the assumptions has been tested in isolation with all other inputs held constant, with the results reported in the table below. In terms of the modelled change in NPV resulting from the variance in the base assumptions at a discount rate of 7%. The final row of the table examines each assumption simultaneously to provide a 'combined' or overall sensitivity of the model findings to the assumptions used in the table below outlines the distribution of NPV allowing for a 10% confidence interval, with the '5%' and '95%' representing a 90% probability that the NPV will be within the range outlined in the table.

At a discount rate of 7%, there is a 90% probability the project will provide an NPV of between \$7.7 million and \$16.2 million for Snowy Valleys LGA. Sensitivity testing returned a positive NPV for 100% of the 5,000 iterations run in the Monte Carlo analysis for Karratha LGA.

Table 4.3. Sensitivity Analysis of Key Assumptions, Discount Rate 7%, Baseline Demand Scenario

Variable	Net Present Value (\$M)	
	5%	95%
Costs		
Capital Expenditure	\$10.8	\$13.1
Operational Expenditure	\$12.1	\$12.2
Environmental Impact	\$12.0	\$12.3
Injuries	\$11.4	\$12.9
Benefits		
Facility Revenue	\$12.0	\$12.3
National Park Pass Revenue	\$11.4	\$12.9
Bike Hire Producer Surplus	\$12.1	\$12.2
Shuttle Service Producer Surplus	\$12.0	\$12.3
Benefit from Induced Visitor Expenditure	\$9.4	\$14.9
Health Benefit	\$9.4	\$14.9
Underpass Residual Value	\$12.1	\$12.2
Overall Combined	\$7.7	\$16.2

Notes: The percent distributions used for each variable are provided below:

- Capital Expenditure: maximum 30% higher, minimum 20% lower.
- Operational Expenditure: normal distribution with standard deviation of 0.1.
- Environmental Impact: normal distribution with standard deviation of 0.2.
- Injuries: normal distribution with standard deviation of 0.2.
- Facility Revenue: normal distribution with standard deviation of 0.1.
- National Parks Pass Revenue: normal distribution with standard deviation of 0.1.
- Bike Hire Producer Surplus: normal distribution with standard deviation of 0.2.
- Shuttle Service Producer Surplus: normal distribution with standard deviation of 0.2.
- Benefit from Induced Visitor Spend: normal distribution with standard deviation of 0.2.
- Health Benefit: normal distribution with standard deviation of 0.2.
- Underpass Residual Value: maximum 20% higher, minimum 30% lower.

Source: AEC.

4.1.4.3 Inclusion of an Amenity Benefit

The CBA results in section 4.1.3.1 exclude an amenity benefit for users. This has been done as user amenity will in part be covered by the access fee and park pass (which reflect the minimum that users are willing to pay), as well as the health benefit.

However, as part of sensitivity testing, a scenario which includes an additional amenity benefit for using the trails will be included, based on research regarding people's willingness to pay to access MTB trails. This would further enhance the net present value and benefit cost ratio demonstrated in section 4.1.3.1.

The amenity benefit is equal to the willingness to pay by the user minus the access fee. The CBA utilised an access fee of \$1.50, whilst research suggested a willingness to pay by users of \$3.64 per use, equating to an amenity benefit of \$2.14. The following table reflects the impact of including this additional benefit.

Table 4.4. Summary CBA Results, Baseline Demand Scenario Including Rider Amenity Benefit

Impact	Total Value (\$M)	PV (\$M) - 4% Discount Rate	PV (\$M) - 7% Discount Rate	PV (\$M) - 10% Discount Rate
Costs				
Capital Expenditure	\$8.4	\$7.9	\$7.6	\$7.3
Operational Expenditure	\$1.3	\$0.8	\$0.6	\$0.4
Environmental Impact	\$1.1	\$0.7	\$0.6	\$0.4
Injuries	\$4.7	\$3.0	\$2.2	\$1.7
Total Costs	\$15.5	\$12.5	\$11.0	\$9.9
Benefits				
Facility Revenue	\$1.4	\$0.9	\$0.7	\$0.5
National Park Pass Revenue	\$9.8	\$6.3	\$4.6	\$3.5
Bike Hire Producer Surplus	\$0.5	\$0.3	\$0.2	\$0.2
Shuttle Service Producer Surplus	\$1.2	\$0.7	\$0.6	\$0.4
Benefit from Induced Visitor Expenditure	\$18.0	\$11.4	\$8.5	\$6.5
Health Benefit	\$17.9	\$11.4	\$8.5	\$6.5
Amenity Benefit	\$2.6	\$1.7	\$1.2	\$1.0
Underpass Residual Value	\$1.4	\$0.9	\$0.7	\$0.5
Total Benefits	\$51.7	\$32.9	\$24.4	\$18.6
Summary				
Net Present Value (NPV)	-	\$20.4	\$13.4	\$8.7
Benefit Cost Ratio (BCR)	-	2.64	2.22	1.88

Note: Totals presented in the table may not equal the sum of costs and benefits due to rounding.
Source: AEC.

5. ECONOMIC IMPACT ASSESSMENT

5.1 APPROACH

Economic modelling in this section estimates the economic activity supported by the construction activity of the Project, as well as economic activity supported post construction (during operations). Three demand growth scenarios have been assessed, as presented in section 3.5. Economic modelling has been undertaken for the year 2030.

Input-Output modelling is used to examine the direct and flow-on² activity expected to be supported within the Snowy Valleys LGA economy. A description of the Input-Output modelling framework used is provided in Appendix B.

Input-output modelling describes economic activity by examining four types of impacts:

- **Output:** Refers to the gross value of goods and services transacted, including the costs of goods and services used in the development and provision of the final product. Output typically overstates the economic impacts as it counts all goods and services used in one stage of production as an input to later stages of production, hence counting their contribution more than once.
- **Gross product:** Refers to the value of output after deducting the cost of goods and services inputs in the production process. Gross product (e.g., Gross Regional Product (GRP)) defines a true net economic contribution and is subsequently the preferred measure for assessing economic impacts.
- **Income:** Measures the level of wages and salaries paid to employees of the industry under consideration and to other industries benefiting from the project.
- **Employment:** Refers to the part-time and full-time employment positions generated by the economic stimulus, both directly and indirectly through flow-on activity, expressed in full time equivalent (FTE) positions³.

The following assumptions have been used in assessing the construction and operations phase impacts of the project. For operations phase impacts, only the economic activity associated with operations of the project (i.e. revenue and operating costs), the bike hire and shuttle service expenditure, as well as induced visitor spend are examined. A range of other potential benefit are also identified in section 2.4 but are not included in this assessment due to data limitations to quantify and value these benefits.

5.1.1 Construction Phase

The proposed project is estimated to cost approximately \$8.4 million to construct (see section 3.2 for detailed breakdown). For modelling purposes, the capital outlay for the project was disaggregated into relevant industries represented in the Input-Output model (based on the Australian and New Zealand Standard Industrial Classification (ANZSIC) categories). A summary of expenditure for development of the project broken down by relevant industry is outlined in the table below.

Table 5.1. Construction Cost by Industry (\$M) ^(a)

Industry	Spend (\$)
Professional, Scientific and Technical Services	\$1,200,000
Construction Services	\$4,733,500
Heavy and Civil Engineering Construction	\$2,340,500
Electrical Equipment Manufacturing	\$25,000
Motor Vehicles and Parts; Other Transport Equipment manufacturing	\$100,000
Total	\$8,399,000

Note: (a) Items may not sum to the total due to rounding.
Source: AEC, Touch Point One (2020).

² Both Type I and Type II flow-on impacts have been presented in this report. Refer to Appendix B for a description of each type of flow-on impact.

³ Where one FTE is equivalent to one person working full time for a period of one year.

Only the construction activity expected to be undertaken within the Snowy Valleys LGA economy has been included in the economic impact assessment. For the purposes of this assessment it was assumed:

- 50% of professional, scientific, and technical services related to construction activity will be undertaken and sourced from outside the Snowy Valleys LGA region.
- All electrical equipment manufacturing and motor vehicles and parts manufacturing related to construction activity will be undertaken and sourced from outside the Snowy Valleys LGA region.
- Approximately 30% of heavy and civil engineering construction materials and services will be imported from outside the Snowy Valleys LGA region.
- Approximately 50% of construction services will be imported from outside the Snowy Valleys LGA region.

5.1.2 Operations Phase

Once operational the project is expected to generate economic activity through three primary avenues:

- Economic benefits associated with the operations of the facility.
- Additional/ induced expenditure by trail users on bike hire and shuttle services.
- Additional/ induced expenditure by visitors on other goods and services.

The following sub-sections outline the direct operational phase activity within the Snowy Valleys LGA economy that are anticipated to be attributable to the project.

In assessing the economic impacts of the project once operational, only the incremental (or net) change in economic activity over and above what would otherwise be expected to occur has been included. That is, any activity that would otherwise be expected to occur without the project is excluded on the basis that this activity is not delivered by the project.

5.1.2.1 Facility Operations

Facility revenue and operating expenditure related to facility operations has been estimated as per the approach used in section 4.1.2.2. In 2030, operating revenue has been estimated to total between approximately \$0.07 million (low growth scenario) and \$0.09 million (high growth scenario). Operating expenditure has been estimated to total approximately \$0.1 million, with non-labour operating expenditure totalling approximately \$0.07 million, whilst wages and salaries supported by this activity totals approximately \$0.03 million. These estimates resulted in a gross operating deficit of between approximately \$0.02 million (low growth scenario) and \$0.01 million (high growth scenario) in 2030. Estimates of flow-on activity in the Snowy Valleys LGA economy have been modelled based on the operating expenditure outlined above, allocated to the sector of Sports and Recreation in the Input-Output model, with direct operational activity based on the revenue, operating costs, employment and incomes outlined above.

5.1.2.2 Bike Hire and Shuttle Services

Bike hire and shuttle service expenditure has been estimated as per the approach used in section 4.1.2.2. In 2030, bike hire expenditure is estimated to total between approximately \$0.22 million (low growth scenario) and \$0.23 million (high growth scenario). In the same year, shuttle service is estimated to total between approximately \$0.4 million (low growth scenario) and \$0.6 million (high growth scenario). Bike hire expenditure has been modelled through the Rental and Hiring Services (except Real Estate) Input-Output industry, whilst shuttle service expenditure has been modelled through the Road Transport Input-Output industry.

5.1.2.3 Induced Expenditure by Visitors

Visitor expenditure induced by the project has been estimated as per the approach used in section 4.1.2.2. In 2030, the overall induced visitor expenditure in the Snowy Valleys region due to the project is between approximately \$4.7 million (low growth scenario) and \$6.4 million (high growth scenario). As in section 3.6.3, this has been broken down by item based on the Tourism Research Australia expenditure by item shares at the national level (with the

shares modified slightly to reflect the typical spend on accommodation in the Snowy Valleys LGA), and expenditure items then allocated to the most relevant industries in the Input-Output model.

5.2 ECONOMIC IMPACT ASSESSMENT

5.2.1 Construction

The economic contribution of the construction of the trail network to the Snowy Valleys LGA economy is presented in Table 5.2. Input-Output modelling indicates the project is anticipated to support an estimated 21 full time equivalent (FTE) jobs in Snowy Valleys LGA, comprised of 10 FTE jobs directly, as well as 11 FTE jobs supported through flow-on activity (including both Type I and Type II flow-on activity). Jobs supported by the project are estimated to pay \$1.5 million in wages and salaries, including direct and flow-on jobs.

The project is estimated to produce around \$6.2 million in output for Snowy Valleys LGA businesses during construction (including direct and flow-on activity). This is estimated to produce \$2.9 million in Gross Regional Product (GRP), including \$1.3 million in GRP directly and \$1.6 million through flow-on activity. These results represent the economic contribution of the project within the Snowy Valleys LGA.

Table 5.2. Economic Contribution of Talbingo and Yarrangobilly MTB Trail Network Construction, Snowy Valleys LGA

Impact	Output (\$M)	GRP (\$M)	Incomes (\$M)	Employment (FTEs)
Initial Stimulus in Local Economy	\$3.1	\$1.3	\$0.7	10
Production Induced Impacts	\$1.5	\$0.6	\$0.4	5
Household Consumption Impacts	\$1.6	\$1.0	\$0.4	6
Total Impacts in Local Economy	\$6.2	\$2.9	\$1.5	21

Note: Totals may not sum due to rounding. Flow-on contribution has been disaggregated by Type I (production induced) and Type II (consumption induced) impacts. See Appendix A for definitions of Type I and Type II flow-on impacts.
Source: AEC.

5.2.2 Operations

The economic contribution of the project to the Snowy Valleys LGA economy is presented in Table 5.3, including the economic contribution from operations, and expenditure by visitors, shuttle users, and bike hires. The below text refers to the baseline growth scenario, whilst all three scenarios have been presented in Table 5.3 highlighting marginal differences in impacts between scenarios. The below estimates are indicative of the average annual output, GRP, incomes, and employment afforded by the project by 2030-31.

Input-Output modelling indicates operations of the project and associated tourism expenditure of visitors is anticipated to support an estimated 55 full time equivalent (FTE) jobs in Snowy Valleys LGA per annum under the baseline growth scenario, comprised of 35 FTE jobs directly, as well as 20 FTE jobs supported through flow-on activity (including both Type I and Type II flow-on activity). Under the baseline growth scenario, jobs supported by operations of the project are estimated to pay \$3.3 million in wages and salaries annually, including direct and flow-on jobs.

Operations of the project is estimated to produce around \$11.8 million in output per annum for Snowy Valleys LGA businesses under the baseline growth scenario (including direct and flow-on activity). This is estimated to produce \$6.3 million in GRP per annum, including \$3.2 million in GRP directly and \$3.1 million through flow-on activity (under the baseline growth scenario). These results represent the economic contribution of the operations of the project within the Snowy Valleys LGA each year under the baseline growth scenario.

Table 5.3. Economic Contribution of Talbingo & Yarrangobilly MTB Trail Network Operating Activity, 2030-31, Snowy Valleys LGA

Impact	Output (\$M)	GRP (\$M)	Incomes (\$M)	Employment (FTEs)
Low Growth Scenario				
Initial Stimulus in Local Economy	\$5.3	\$2.7	\$1.6	30
Production Induced Impacts	\$1.6	\$0.7	\$0.4	5
Household Consumption Impacts	\$3.1	\$1.9	\$0.8	12
Total Impacts in Local Economy	\$10.0	\$5.3	\$2.8	46
Baseline Growth Scenario				
Initial Stimulus in Local Economy	\$6.3	\$3.2	\$1.9	35
Production Induced Impacts	\$1.8	\$0.9	\$0.5	6
Household Consumption Impacts	\$3.7	\$2.2	\$1.0	14
Total Impacts in Local Economy	\$11.8	\$6.3	\$3.3	55
High Growth Scenario				
Initial Stimulus in Local Economy	\$7.3	\$3.7	\$2.2	40
Production Induced Impacts	\$2.1	\$1.0	\$0.5	7
Household Consumption Impacts	\$4.3	\$2.5	\$1.1	16
Total Impacts in Local Economy	\$13.7	\$7.2	\$3.8	63

Note: Totals may not sum due to rounding. Flow-on contribution has been disaggregated by Type I (production induced) and Type II (consumption induced) impacts. See Appendix A for definitions of Type I and Type II flow-on impacts.
Source: AEC.

6. GOVERNANCE OPTIONS

6.1 BACKGROUND

A critical outcome of the development of the Master Plan will be the identification of appropriate governance arrangements for the management and operation of the trail network and associated infrastructure and facilities.

The purpose of this section is to outline the advantages and disadvantages of appropriate governance options and make recommendations on the preferred governance and operating model.

6.2 APPROACH

The approach taken in this governance review was to undertake a critical review of the governance models allowable under the existing NSW legislative framework, within which Council and the NPWS operate.

In undertaking this critical assessment and in making a recommendation for the preferred option, the following key principles were applied:

- That the governance model's arrangements and accountability are clear and easily understood
- That the strengths and expertise offered by each party are reflected in the responsibilities and authority reflected in the governance model
- That the governance model supports a focus on increasing tourism and visitation to the region as a significant trail destination
- That the governance model facilitates the maximisation of non-public revenue funding sources and re-investment in the trail network and facilities

6.3 GOVERNANCE MODELS

The review examined the range of appropriate governance models that would support a focus on increasing tourism and visitation to the region, thereby enhancing employment and economic growth opportunities for the local economy. A description of the advantages and disadvantages of each governance model provides insight into the merits and risks associated with each option.

6.4 CURRENT ARRANGEMENTS

If funding is secured, a Project Delivery Committee (PDC) will be formed to finalise planning activities and manage the delivery of the project.

The PDC would be expected to comprise the following representatives:

- NPWS
- Snowy Valleys Council
- Destination Riverina Murray
- Talbingo MTB Inc.
- Construction Contractor (when appointed).

6.5 LAND TENURE & PROJECT DEVELOPMENT

The land to be used for the Talbingo and Yarrangobilly trail precinct is wholly controlled by the NSW NPWS who are subject to the National Parks and Wildlife Act 1974 and National Parks and Wildlife Regulation 2019, which may fully or partially constrain their ability to implement or be party to any preferred governance model. Any recommended governance model(s) will need to be tested against this legislation to determine the NPWS' ability to agree to such a model(s).

As the land is located within a National Park, it must remain in public ownership but can be leased or licensed for recreational and sporting purposes, subject to Ministerial approval, (National Parks and Wildlife Act 1974 no 80, Part 12 S150 & S150A).

The proposed trail network has yet to be developed and before being commissioned the management needs of the network will differ depending on the phase of operation (planning, construction or operational). The governance model may therefore need to adapt as the project is implemented from Master Planning to construction to commencement to ongoing operations, as each will require different skill sets in the governance body.

6.6 GOVERNANCE MODELS

There are three basic forms of governance models that have been considered:

- Models based on public land ownership and sole agency public operator (either with or without a community/ user reference group)
- Models based on public land ownership and community/ user group partnerships and operator
- Models based on public land ownership and private operator

Models based on private land ownership have been excluded due to the public land tenure arrangements identified

An assessment of the characteristics, advantages, and disadvantages of these types of governance arrangements is provided in the table below.

Table E. 1. Governance Arrangements: High Level Assessment

Governance Model	Characteristics	Advantages	Disadvantages	Examples
Sole Agency (no Reference Group)	<ul style="list-style-type: none"> Land can be leased or licenced to another agency with Ministerial approval Use of land would be subject to an approved plan of management Governance and operational management of a trail by one or more Federal, State or Local Government agency Trail maintenance costs (capital and operational) would be the responsibility of the sole agency Other government agencies may be involved for consultation/ advisory purposes Other providers (including private) can be engaged to deliver specific events 	<ul style="list-style-type: none"> Clear and simple management and decision-making responsibilities Consistent service standards can be applied over the trail Some certainty over operational funding although requires sole agency commitment for ongoing funding (capital and operational) Skills and experience exist within staffing base to manage environment, cultural, and recreational aspects of the trail Ability to access Federal and State grant funding and potentially sponsorships Lower risk of failure due to being a government body 	<ul style="list-style-type: none"> Political influences may affect appropriate and timely decision-making Visitor experience is subject to the sole agency operator's performance, allocated budget, and decision-making Other organisational priorities may affect operational and funding decisions (capital and operational) Ability to access other sources of funding will be limited to Federal and State sources Marketing, promotional, and other skills may not be available due to trail management not being core business No official role for community and user groups Cost and management burden will rest with the sole agency 	<ul style="list-style-type: none"> Great Ocean Walk, Victoria Grampians Peak Walk, Victoria Mount Butler Mountain Bike Park, Victoria Overland Track, Tasmania Larapinta Trail, New Zealand Mount Stromlo Forest Park, ACT Blue Derby Mountain Bike Trails, Tasmania
Sole Agency (with Reference Group)	<ul style="list-style-type: none"> Land can be leased or licenced to another agency with Ministerial approval Use of land would be subject to an approved plan of management Governance and operational management of a trail by one or more Federal, State or Local Government agency Trail maintenance costs (capital and operational) would be the responsibility of the sole agency The sole agency could utilise voluntary assistance or establish an MoU with Talbingo MTB for trail maintenance and 	<ul style="list-style-type: none"> Clear and simple management and decision-making responsibilities Consistent service standards can be applied over the trail Some certainty over operational funding although requires sole agency commitment for ongoing funding (capital and operational) Skills and experience exist within staffing base to manage environment, cultural, and recreational aspects of the trail Expertise of key stakeholders can be accessed for specialist advice and support 	<ul style="list-style-type: none"> Political influences may affect appropriate and timely decision-making Visitor experience is subject to the sole agency operator's performance, allocated budget, and decision-making Other organisational priorities may affect operational and funding decisions (capital and operational) Ability to access other sources of funding will be limited to Federal and State sources Marketing, promotional, and other skills may not be available 	<ul style="list-style-type: none"> Jindabyne Trail Stewardship, New South Wales Majura Trail Alliance, ACT

Governance Model	Characteristics	Advantages	Disadvantages	Examples
	<p>supervision, and Destination Riverina Murray for promotional and marketing advice and support</p> <ul style="list-style-type: none"> • Other government agencies may be involved for consultation/ advisory purposes • A stakeholder reference group could be established to provide input into trail decision making • Other providers (including private) can be engaged to deliver specific events 		<p>due to trail management not being core business</p> <ul style="list-style-type: none"> • Role for community and user groups through a reference group • Cost and management burden will rest with the sole agency 	
Incorporated Body Operator	<ul style="list-style-type: none"> • Land can be leased or licenced directly to an incorporated association with Ministerial approval • Use of land would be subject to an approved plan of management • Body would be established as a Committee of Management, Foundation, Trust, or Incorporated Body under the Associations Incorporation Act 2009 No 7 • Operational costs would be borne by the incorporated body including trail maintenance costs (capital and operational) 	<ul style="list-style-type: none"> • Allows multiple stakeholders to work together under a single entity • Specific defined responsibilities can be established which allow access to specialist expertise • Can be effective if there is a strong level of commitment from the various partners • Provides a broader base to access external funding including philanthropic and private sector grants and sponsorships • Visitor experience may be improved due to involvement of user groups 	<ul style="list-style-type: none"> • Could result in poor performance due to inexperience in Board/ management roles • May be differing priorities among partners resulting in friction and conflict • Financial sustainability will be an issue without ongoing financial support from State and/or Local Government agencies • If the incorporated body fails, then trail management and operational responsibility will fall back to DPWS 	<ul style="list-style-type: none"> • Murray to Mountains Rail Trail, Victoria • Surf Coast Walk, Victoria • Bibbulmun Track, Western Australia • Munda Biddi Trail, Western Australia • Queenstown Trails, New Zealand • Motu Cycle Trails, New Zealand • Forrest Mountain Bike Trails, Victoria

Governance Model	Characteristics	Advantages	Disadvantages	Examples
Private Operator	<ul style="list-style-type: none"> Land can be leased or licenced directly to a private operator with Ministerial approval Use of land would be subject to an approved plan of management Operational costs would be borne by the private operator including trail maintenance costs (capital and operational) 	<ul style="list-style-type: none"> Clear responsibility and decision-making based on growth driven by required returns Can make quick decisions and responses driven by user needs Can bring specific knowledge to enhance the user experience Provides a base to access external funding including philanthropic and private sector grants and sponsorships 	<ul style="list-style-type: none"> Reliant on the private operator's finances and backing No role for Snowy Valleys Council, community, or user groups DPWS and/or Snowy Valleys Council may need to provide a financial incentive and/or ongoing management fee to make the operation attractive to private investors/ operators 	<ul style="list-style-type: none"> Banks Peninsula Track, New Zealand Welcome Rock Trails, New Zealand

MULTI CRITERIA ASSESSMENT

To undertake an assessment of the alternative governance options, several criteria were identified to determine the extent to which the option will meet the following vision and outcome sought:

- That the governance arrangements and accountability are clear and easily understood
- That the strengths and expertise offered by each party are reflected in the responsibilities and authority reflected in the preferred option
- That the business model supports a focus on increasing tourism and visitation to the region as a significant trail destination
- That revenue funding can be maximised to finance re-investment in the trail network and facilities

The identified criteria were:

- Is the model simple to administer?
- Does the model provide clear accountability?
- Does the model maximise the expertise of partners?
- Will the model facilitate increased visitation?
- Does the model maximise revenue raising opportunities and reduce reliance on public funds?
- Does the model support ongoing financial sustainability?
- Does the model support the input of key stakeholders and community groups?
- Does the model manage key risks effectively?

The table below provides an assessment of each of the governance options using a consistent scoring methodology as follow:

- Does not meet criteria (Score -1)
- Partially meets criteria (Score 0)
- Mostly meets criteria (Score 1)
- Fully meets criteria (Score 2).

Table E. 2. Preferred Governance Model: Multi Criteria Analysis

Criteria	OPTION 1 Sole Agency Operator (no Reference Group)	OPTION 2 Sole Agency Operator (with Reference Group)	OPTION 3 Incorporated Body Operator	OPTION 4 Private Operator
Ease of model administration	2	1	1	2
Clear accountability	2	2	1	2
Maximise expertise	0	1	2	1
Facilitates increased visitation	0	1	1	1
Maximises revenue raising	1	1	2	1
Financial sustainability	1	1	0	0
Stakeholder input	0	1	1	0
Risk management	1	1	0	0
TOTAL	7	9	8	7

Source: AEC

The outcome of the MCA highlights Option 2: Sole Agency Operator with Reference Group as the preferred option.

RECOMMENDED APPROACH

- Initially, the Sole Agency Operator (with Reference Group) governance model is the recommended option, however, an appropriate way forward may be to transition to an Incorporated Body Operator within 3-5 years.
- This transition period would allow time for the Reference Group members (such as Talbingo MTB Inc.) to develop and gain experience in managing the trail network and all parties to gain a better understanding of the:
 - Operational revenues and costs of the operation
 - Actual visitation growth and number of events
 - Funding sources that may be accessible.
- Without a final decision on a transition to an Incorporated Body Operator model, the financial analysis has been modelled based on the Sole Agency Operator only.

7. FINANCIAL ANALYSIS

7.1 MODELLING DRIVERS AND ASSUMPTIONS

For modelling purposes, indexation of capital costs, operational costs, and revenues of 2% per annum have been assumed. Interest rates on positive cash balances have been assumed at 2% per annum and interest rates on negative cash balances have been assumed at 4% per annum.

The capital costs in section 3.2 have been used together with the projected revenue identified in 3.6.1.1 and operating costs identified in Table 3.4.

100% grant funding for all capital expenditure has also been assumed. All capital renewal items have been assumed to be funded through debt for the purposes of financial modelling.

7.2 PROJECT FEASIBILITY

Table 7.1 contains the Net Present Value (NPV) for each of the scenarios modelled. The Internal Rate of Return (IRR), and Modified Internal Rate of Return (MIRR, more accurately reflects the cost and profitability of a project) is also shown for each scenario. As can be seen, both the Baseline and High Growth scenarios return a positive NPV.

Table 7.1. NPV, IRR, and MIRR Outcomes

	NPV	IRR	MIRR
Low Growth	-\$0.059m	14.3%	7.48%
Baseline	\$0.047m	2.90%	8.37%
High Growth	\$0.150m	NA	9.13%

Note: None of the above scenarios include a terminal value for the Trail Network.
Source: AEC.

7.3 FINANCIAL SUSTAINABILITY

- The financial analysis has identified that Council will be able to fund the project due to the 100% grant funding that is assumed will be available.
- The level of modelled revenues escalating at 2.0% per annum will cover operational costs (excluding depreciation) in all scenarios, except in those years where machine re-building works are required to be undertaken.
- From a cash flow perspective, the cumulative cash position under all scenarios is positive meaning that all operational costs (excluding depreciation) are covered by operating revenues.
- For the purposes of financial modelling, the capital costs associated with the formation of the trail (excluding any built infrastructure) have been assumed to have a useful life of 20 years, to reflect the annual benefit of the trail to Council. This results in an annual depreciation charge of \$191,670 (including contingency) for trail formation, however, this approach should be reviewed against Council's depreciation policy. Due to the regular ongoing maintenance of the trail, including machine re-building works every five to ten years, a full replacement of the trail may not be necessary at the end of its useful life, therefore the full replacement cost may not be required to be funded by Council.
- Capital costs of \$472,000 associated with revegetation and weed management have been written off in the first year following completion of the works.
- The nearly \$400,000 cost of depreciation charges (including the trail formation depreciation) associated with the capital expenditure results in a significant operating loss under all scenarios.

Table 7.2 and Table 7.3 (next page) contain the projected operating surplus/ deficit (otherwise known as Net Profit Before Tax) and cumulative cash flows for each of the scenarios over 10 years. As can be seen, the operating position under all scenarios returns a negative result which is driven by the annual depreciation charges.

Table 7.2. Projected Operating Surplus/ Deficit (NPBT)

Scenario	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
Low Growth	\$125,909	\$387,601	\$521,277	\$431,098	\$437,353	\$443,664	\$492,813	\$503,582	\$514,579	\$481,856
Baseline	\$119,516	\$377,934	\$509,024	\$417,402	\$422,281	\$429,497	\$479,406	\$489,715	\$500,238	\$467,027
High Growth	\$113,021	\$368,042	\$496,403	\$403,334	\$409,954	\$416,746	\$466,217	\$476,074	\$486,131	\$452,439

Source: AEC.

Table 7.3. Projected Cumulative Cash Flow (excludes depreciation)

Scenario	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
Low Growth	\$27,883	\$68,705	\$119,630	\$119,177	\$121,083	\$125,463	\$89,654	\$52,217	\$13,106	\$16,226
Baseline	\$34,276	\$84,766	\$147,943	\$161,187	\$178,165	\$196,712	\$174,311	\$150,741	\$125,970	\$143,920
High Growth	\$40,771	\$101,153	\$176,952	\$204,263	\$233,568	\$264,866	\$255,654	\$245,724	\$235,061	\$267,598

Source: AEC.

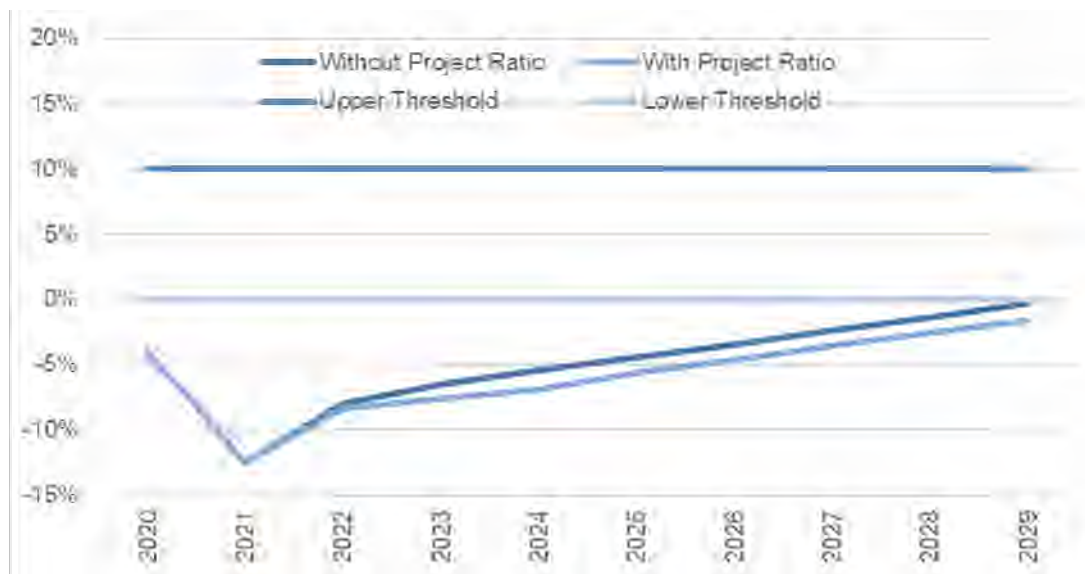
7.4 IMPLICATIONS FOR LONG TERM FINANCIAL PLAN

The following analysis assumes that Council is the sole agency operator of the Trail Network over the full 10 Year period. If the management of the Trail Network were transferred to Talbingo MTB Inc., the position would worsen due to the fact that Council would continue to be responsible for the depreciation charges but would not benefit from any operating surplus (i.e. direct revenue less operational costs).

The development of the Talbingo and Yarrangobilly MTB Trail Network will cost approximately \$8.4 million to deliver with 100% of the capital cost assumed to be funded through a combination of Federal and State Government grants

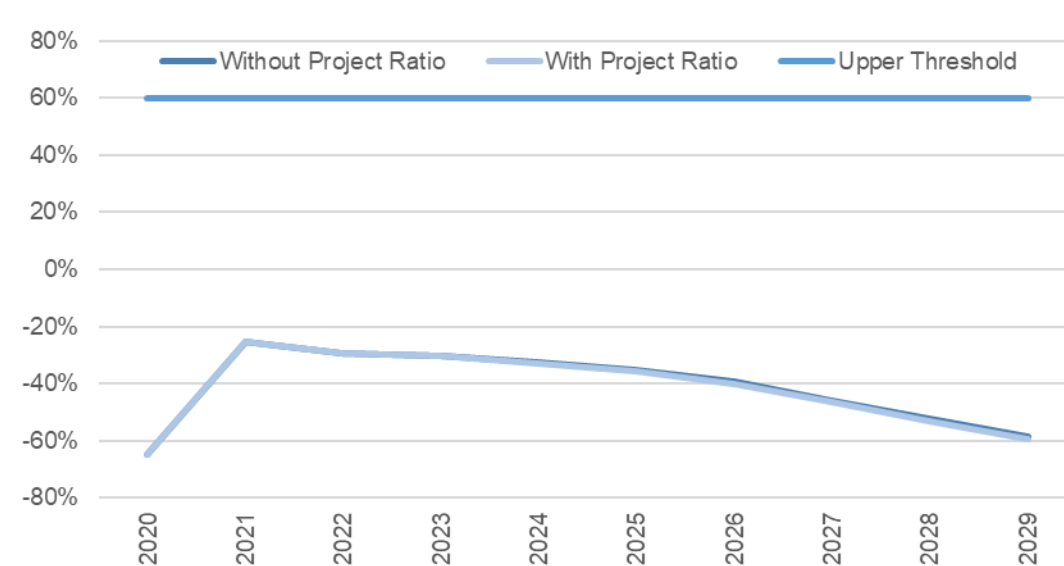
- Under all scenarios, the Operating Surplus Ratio is marginally worsened from 2021-22, when compared to the current Long-Term Financial Plan (LTFP) - (see Figure 7.1 – based on Baseline Scenario).
- Under all scenarios the Net Financial Liabilities Ratio is unchanged, remains negative and is well below the maximum target of +60.0% (see Figure 7.2 - based on Baseline Scenario).

Figure 7.1. Operating Surplus Ratio Comparison



Source: AEC

Figure 7.2. Net Financial Liabilities Ratio Comparison



Source: AEC

8. KEY FINDINGS

The report draws the following key findings following the conduct of the economic and financial assessments:

- Existing Environment:
 - The Tumut Region is heavily reliant on tourism activity to support local businesses and generate economic activity. Due to this heavy reliance, the bushfires in late 2019 and early 2020 as well as the COVID-19 pandemic has had a significant impact on the economy and retention of residents.
 - Indicative estimates of the impact of COVID-19 to the Snowy Valleys LGA economy to 31 October 2020 has been developed based on data from the Australian Bureau of Statistics (ABS, 2020b). These estimates suggest the pandemic resulted in a decline of approximately 200 employees and GRP was estimated to decline by approximately \$21.6 million compared to 2018-19 estimates.
 - There is a need to explore new tourism opportunities, with mountain biking identified as a key prospect.
- Market Analysis:
 - The Tumut Region currently records minimal mountain biking visitation by comparison to neighbouring regions.
 - The cycling market and travel cycling market is recording strong growth year on year. The cycling tourism market (visitors that have recorded cycling as an activity on their trip) has grown by 9.7% in New South Wales on average per annum over the past 10 years. Mountain biking is estimated to represent a large proportion of this.
 - Specifically, the e-bike market is poised for high growth of 6.2% on average per annum between 2020 and 2025 (globally). The rate of product development, investment, and consumer acceptance in Australia indicates that this market segment is on its way to becoming a mainstream category, as is the case in Europe.
 - Leveraging off the existing trails in the Snowy Valleys region, the development of mountain bike trails near Talbingo has the potential to become a significant attractor for mountain bike tourism to the region, providing new business opportunities and increasing the economic benefits to existing businesses.
- Economic Analyses:
 - The Cost Benefit Analysis identifies that the project is highly economically desirable under the 4%, 7% and 10% discount rates for all growth scenarios, returning a positive NPV. The BCR ranges between 2.51 (4% discount rate) and 1.79 (10% discount rate) under the baseline growth scenario, indicating that for each dollar cost the project will generate between \$1.79 and \$2.51 in benefits (i.e. benefits outweigh the costs).
 - Based on a capital cost of \$8.4 million, the Economic Impact Assessment identified that construction of the trail network will support approximately 21 FTE jobs, output of \$6.2 million, \$2.9 million in gross regional product, and wages and salaries of \$1.5 million (including direct and flow on activity).
 - The Economic Impact Assessment identified operations of the facility will support approximately 55 FTE jobs, output of \$11.8 million, \$6.3 million in gross regional product, and wages and salaries of \$3.3 million each year on average under the baseline growth scenario (including direct and flow on activity).
- Governance Options:
 - Initially, the Sole Agency Operator (with Reference Group) governance model is the recommended option, however, an appropriate way forward may be to transition to an Incorporated Body Operator within 3-5 years.
 - This transition period would allow time for the Reference Group members (notably Talbingo MTB Inc.) to develop and gain experience in managing the trail network and all parties to gain a better understanding of the:

- Operational revenues and costs of the operation
- Actual visitation growth and number of events
- Funding sources that may be accessible.
- Without a final decision on a transition to an Incorporated Body Operator model, the financial analysis has been modelled based on the Sole Agency Operator only.
- Financial Assessment:
 - The financial analysis has identified that Council will be able to fund the project due to the 100% grant funding that is assumed will be available.
 - The level of modelled revenues escalating at 2.0% per annum will cover operational costs (excluding depreciation) in all scenarios, except in those years where machine re-building works are required to be undertaken.
 - From a cash flow perspective, the cumulative cash position under all scenarios is positive meaning that all operational costs (excluding depreciation) are covered by operating revenues.
 - While the project is cash flow positive, nearly \$400,000 in depreciation charges (including the trail formation depreciation) are associated with the capital expenditure, which results in a significant operating loss under all scenarios. However, it should be noted that for the purposes of financial modelling the capital costs associated with the formation of the trail (excluding any built infrastructure) have been assumed to have a useful life of 20 years, to reflect the annual benefit of the trail to Council. This results in an annual depreciation charge of \$191,670 (including contingency) for trail formation. This approach should be reviewed against Council's depreciation policy; due to the regular ongoing maintenance of the trail, including machine re-building works every five to ten years, a full replacement of the trail may not be necessary at the end of its useful life, therefore the full replacement cost may not be required to be funded by Council.
 - Under all scenarios, the Operating Surplus Ratio is marginally worsened from 2021-22, when compared to the current Long-Term Financial Plan (LTFP).
 - Under all scenarios the Net Financial Liabilities Ratio is unchanged, remains negative and is well below the maximum target of +60.0%.

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APPENDIX A: MTB MARKET CONTEXT

MTB MARKET OVERVIEW

Market Segments

Whilst many styles of mountain biking have emerged in recent years, the main market segments are cross country & trail, all mountain & enduro, downhill and e-bike. These market segments and their prospects have been described below.

- **Enduro & All Mountain:** These styles of riding involves less focus on climbing, and more focus on descending. Riders will either climb to the top of the hill for the descent or use a chairlift/ shuttle vehicle. This is currently the largest and fastest growing market segment, comprising approximately 60% of all riders (Dirt Art, 2018).
- **Cross Country & Trail:** These styles of riding are less extreme and more suited to all levels, typically involving an equal focus on climbing and descending. Riders will climb to the top of any descents they encounter.
- **Downhill:** This style of riding is primarily geared towards descent, specifically technical, fast, and rough descents. Riders are typically advanced and thrill seeking. Riders use shuttles or chairlifts to get to the starting point of their ride, rather than doing so on the bike.
- **Dirt Jumping:** This style of riding is undertaken on a point-to-point or loop course with a variety of jumps, rollers, and berms. This market is primarily populated by younger riders.
- **E-bike:** This style of riding involves the use of a low powered pedal-assisted bike, allowing riders to go further in their rides. It is anticipated this market segment will have a profound impact on the sport, making the sport more accessible to newer and less capable riders, and increase the riding duration for more experienced riders.
- **Bike Packing/ Gravel Grinders:** This style of riding involves road bikes converted to ride off road, and are often used to carry enough gear to camp along a ride (subject to whether NPWS allows camping in the Kosciuszko National Park area).

Market Characteristics

The mountain biking market can be broken down into two components:

- Local riders
- Tourist riders.

Local Market

The local MTB market is generally considered to include all MTB riders who live within an approximate 50 km radius of an MTB destination and regularly perform the activity. Based on national survey data, characteristics of MTB riders that ride within their local areas include:

- Predominantly male, though female participation is increasing
- Range in age from mid-20s to mid-40s
- Often ride 2-3 times per week (for 30-40 kilometres plus per day) (Dirt Art, 2016).

Tourism Market

Tourists engaging in mountain biking activities can be broken into two market types:

- The *core market* includes those who travel for the sole purpose of mountain biking at the destination. This market continually seeks out new and exciting destinations, and typically travels multiple times a year for mountain biking purposes. Characteristics of this market includes:
 - Predominantly male, though female participation is increasing

- Range in age from mid-20s to mid-40s
- Likely to go on 1 to 4 mountain biking holidays per year
- Have higher than average incomes (though it is important to note that while some riders will travel 4-5 star, young 'shredders' will live out of a car/ camp site and not spend much at the destination, as the majority of their money goes into their bike)
- Tend to travel to destinations within half a day to a day from home, but willing to travel further for competitions or unique experiences (for example driving from Sydney, Melbourne, or Canberra to Talbingo)
- Are prepared to pay for the use of a commercial shuttle service and for the use of trails if they are well maintained
- They are likely to stay in local accommodation and visit local bars, cafes, or restaurants in conjunction with their riding
- Average length of stay when travelling is 3 to 5 days (Mountain Bike Australia, 2018), though trails need to be between 60 to 70 kilometres in length to provide enough trail for a multi-day experience.
- International and interstate tourists spend on average \$205 per night
- Tend to ride/ travel in groups of 2-5 people (TRC Tourism, 2015; TRC Tourism, 2019)
- The *non-core market* includes those whereby mountain biking is not a primary motivator or sole purpose of travel, rather it is a complementary activity. This market has grown significantly in recent years, as options (trails, bikes, programs) are increasingly being provided for all skill levels. This market will be drawn in by targeted marketing, which may increase the length of stay of existing guests and draw guests that may otherwise have travelled to an alternative location. Characteristics of this market tend to overlap with the tourism markets of the destination.

Key Decision Factors

When deciding where to ride, key factors mountain bikers typically consider include:

- Trail quality (i.e. trail style / difficulty / upkeep/ maintenance, on-site services, features, etc.)
- Trail linkages that make sense and provide a logical trail network to ride
- Shuttle options, chairlifts, helicopter lifts, etc. to increase the descending opportunities
- Parking and access to the trails
- Environmental quality (including view, points of interest, forest types)
- Climate and the time of year when trails are enjoyable to ride
- Accommodation (a variety of options from camping to 5-star, mountain bike storage, social areas, ease of access to trails)
- Food and beverage options (variety and location, coffee to start the ride – beer to finish the ride)
- Non-riding activities (pampering experiences (spas, massage, etc.) access to facilities, variety of activities, adventurous activities to supplement riding)
- Events, both ride specific and other events that can form part of a holiday or weekend away.

These factors are assessed in regard to Talbingo and the Snowy Valleys region in more detail in the following sections.

EXISTING SUPPLY OF TRAILS AND SUPPORTING INFRASTRUCTURE/ SERVICES

Trails

Talbingo is located on the western edge of North Kosciuszko National Park, providing significant opportunities to act as a base/ hub for MTB tourism activity. Currently, the majority of the trails in the vicinity of Talbingo are located in North Kosciuszko National Park, which houses over 200 kilometres of trails (including both fire trails and single track) and over 1,700 meters in elevation (Trailforks, 2020). There are various entrances to the trails, with the closest positioned along the Snowy Mountains Highway. Lookouts are positioned along the trails, as well as camping sites which are positioned both along the trails and at the entrances.

In addition to the trails in North Kosciuszko National Park, the Snowy Valleys region has hundreds of kilometres of trails across the various mountains/ valleys. Trails other than those identified around Talbingo include:

- Tumut – Over 10 kilometres of trails with up to 500 metres in elevation and one carpark entrance.
- Tumbarumba – Over 20 kilometres of trails with up to 800 metres in elevation and multiple carpark entrances to the various sites (Trailforks, 2020). This area is emerging as a cycling hub for the broader region.

Development of the Talbingo and Yarrangobilly MTB Trail Network would become supplementary to these existing trails in the region (i.e. riders will travel to Talbingo for the Talbingo and Yarrangobilly MTB Trail Network and also ride existing trails in Tumut and Tumbarumba if they get time). This is evident in Jindabyne, where riders travel and stay in Jindabyne for daily riding at the Thredbo Mountain Bike Park, however, will ride trails in Jindabyne in their spare time or on their way home (i.e. before/ after the bike park closes). This will further enhance the attractiveness of the region for mountain biking tourism purposes.

Existing Businesses

Existing business in the area will have a significant opportunity to capitalise on the increased mountain biking related tourism and will also need to be sufficient to support demand from this influx and further enhance the attraction of the region. The key business types that will be enhanced include bike sales, hire and maintenance businesses, food and beverage services, accommodation, and complementary activities/ services including the golf club.

Bike Stores

Bike stores located within close proximity to the trails provide local and tourist riders with their daily needs, including spare parts, accessories, servicing/ maintenance/ repairs, hiring services, etc. There are currently no operational bike stores located in Talbingo, with only one sports/ ski hire shop which carries minimal spares and a couple of hire bikes but is generally only open on weekends or during peak periods. This indicates there is limited purchasing, hiring and bike maintenance options for locals and travellers (Google Maps, 2020). As Tumut and Tumbarumba are the two main locations for MTB riding (other than Talbingo) in the Snowy Valleys region, they also house most of the MTB stores. Tumut has two stores, where riders can purchase bikes/ accessories/ parts, hire bikes, or have maintenance undertaken on their bikes. Tumbarumba has one store, where bikes can be hired (Google Maps, 2020).

There is an opportunity for additional bike stores offering a wider variety of products, servicing/ maintenance/ repair services, and bike hire/ tours in Talbingo and surrounds.

Food and Beverage

Quality food and beverage offerings delivered by the private sector is essential for attracting riders, generating yield, and ensuring visitors return. The food and beverage offering of the region needs to be continuously developed to meet the MTB tourism market needs and expectations. As a small town, Talbingo currently provides few food and beverage options for travellers. Options include a supermarket/ cafe, and a country club/ Chinese restaurant (Google Maps, 2020).

More broadly, the Snowy Valleys is known for its wine, beer and spirit, fruit and produce offering. The Snowy Valleys Destination Management Plan (2018) identified the need for the Snowy Valleys to deliver an improved food and beverage experience, leveraging this local produce.

There is an opportunity to increase the number of food and beverage services in and around Talbingo, and for these businesses to cater to the MTB tourism market, offering nutritious/ energy boosting meals, storage for bikes whilst visiting (i.e. bike racks), and located within proximity to accommodation and the trails.

Accommodation

The below accommodation information was published pre-bushfire. Accommodation availability has changed since, and therefore, the below information likely overestimates the current accommodation offering and the supply-demand gaps may be more pronounced.

The accommodation offering of Talbingo and surrounds will play an important role in attracting, supporting, and sustaining continued visitation to the region for mountain biking purposes.

Talbingo provides a variety of accommodation types, due to its long-standing position as a provider of water and winter sport tourism. Accommodation options include various camping grounds, a caravan park, mountain retreat, and seven other cottages/ apartments. Bedspaces provided by these accommodation options in Talbingo are estimated to total approximately 340 (including that provided by camping/ caravan parks). This does not include rental houses/ properties, including those operated by AirBnB and other real estate agencies.

A significant proportion (70%) of the dwelling stock in Talbingo is used as holiday houses and temporary accommodation for visitors to the region, equating to approximately 196 dwellings available. Several dwellings are currently utilised as a short-term rental for transient Snowy Hydro 2.0 contractors. Additionally, Airbnb provides 8 entire homes in Talbingo, available for 40% of the year with an occupancy rate of 51% (Snowy Valleys Council, 2018).

Audits conducted for the Destination Management Plan (2018) and Riverina Murray Accommodation Market Assessment (2019) identified between 70 to 80 accommodation providers within the key townships of the Snowy Valleys, including 672 guest rooms with a total capacity of approximately 2,986 bedspaces across the region. Projected visitor nights indicate potential demand for an additional 16,000 visitor nights for the region over the next 10 years (not including consideration of the Talbingo and Yarrangobilly MTB Trail Network development), which would require between an additional 20 (low growth) to 180 guest rooms (high growth) to service this demand (Urban Enterprise, 2019).

Standard hotel/ motor inns are the largest accommodation choice for visitors across the region, comprising 45% of visitation, followed by caravan parks (31.0%), and luxury hotels or resorts (6.8%) (Urban Enterprise, 2019). Gaps exist in the Snowy Valleys in relation to 4-star self-contained apartments, eco-lodges, boutique hotels, and glamping opportunities (Destination Riverina Murray, 2019). Tumut has the largest concentration of accommodation (41% of bedspaces), followed by Khancoban (15%), Batlow (13%), Tumberumba (13%), Talbingo (11%), and Adelong (7%) (Snowy Valleys Council, 2018).

Similar to Talbingo, the broader Snowy Valley region also has a large proportion of dwelling stock (totalling 6,430) operated as holiday houses and temporary accommodation through real estate agencies. Additionally, AirBnB is also a major accommodation provider in the region. Airbnb recorded 71 active rentals in the Snowy Valleys region in 2019 with an occupancy rate of 38%; the majority are located in Adelong, Little River, and Talbingo (Urban Enterprise, 2019).

There is an opportunity to increase the accommodation offering in Talbingo and surrounds to support the potential increased demand from mountain bike riders in the coming years, including in the form of camping grounds, backpacking accommodation, boutique experiential accommodation, Airbnb, and motels. All options should be able to support the requirements of the MTB tourism market, including the provision of bike storage, bike washes, etc.

Complementary Activities/ Services

Complementary activities and services will play an important role in encouraging a longer length of stay and providing MTB riders with opportunities for their 'down days' and for family members who do not ride to enjoy local

attractions. Due to its location on the edge of Kosciuszko National Park and between Blowering Dam to the north and Talbingo Dam to the south, there are many nature-based activities on offer in Talbingo and the broader Snowy Valleys region. This includes hiking/ bushwalking, mountain biking, rail trails, fishing, horse riding, water sports, Yarrangobilly Caves, 4WD, and daytrips to other towns.

Talbingo is home to the Snowy Mountains Hydro Electric Scheme's largest power station, Tumut 3. Travelers can take a scenic drive through town to the station, where there is interpretive signage, BBQ facilities and amenities (JindyInn, 2020). From here, travelers can drive north to visit the Jounama Small Hydro Power Station and Blowering Power Station, or south to visit the Tumut 1 and 2 UG Power Station and others.

There are a range of visitor centres providing information for visitors on the history and culture of the region, including the Tumut Region Visitor Centre, Tumberumba Visitor Centre, Yarrangobilly Caves Visitor Centre, and the Khancoban Visitor Centre. These visitor centres provide opportunities for visitors to experience the local history and culture through tours such as the Wiradjuri Aboriginal Cultural Tour (Visit Snowy Valleys, 2020)

Events

Currently, the Snowy Valleys hosts approximately 10 visitor attracting events per annum, the majority of which are family and lifestyle events, followed by sport and recreation events (Snowy Valleys Council, 2018). Key events over the 2018 calendar year included:

- Batlow CiderFest
 - Approximately 4,500 attendees over one day
 - Approximately 62% of visitors from outside the Snowy Valleys region. The visitation from outside the region is increasing year on year.
 - Approximately 66.0% of visitors surveyed stayed overnight
 - Average length of stay of 3 nights (Batlow CiderFest, 2018; Snowy Valleys Council, unpublished).
- Tumbafest
 - Approximately 5,000 attendees over two days
 - Approximately 52% of visitors from outside the Snowy Valleys region
 - Average length of stay of two nights for 75% of attendees (Snowy Valleys Council, unpublished).

Accessibility

Talbingo (and the Snowy Mountains) can be accessed in two ways:

- Driving from location of origin through the only access road in and out of Talbingo – the Snowy Mountains Highway.
- Flying into Canberra or Melbourne airports, and driving for between 2.5 and 3 hours and between 6 and 8 hours, respectively.
- Flying into the airstrip located at Talbingo (subject to ownership/ approval for use)
- There are currently no shuttle options available from Canberra to Talbingo. Since the establishment of Derby in Tasmania, shuttle service businesses have been established to transport riders from Launceston to Derby.

KNOWN FUTURE SUPPLY OF AND SUPPORTING INFRASTRUCTURE/ SERVICES

Trails

Various MTB projects have been suggested in the Snowy Valleys Destination Management Plan (2018). These include:

- **Hume and Hovell MTB Track and Adventure Trail:** This project will build on the existing 426-kilometre Hume and Hovell walking track to allow it to be utilised for mountain biking purposes. The idea is for the trail to be utilised as both a series of separate day rides, or a 3-day MTB adventure combining on-track camping or shuttles to and from accommodation services. The masterplan has been developed; however, funding has not yet been sought.
- **Tumut MTB Park:** This project will allow the expansion of the existing mountain biking park, conditional of agreement from adjoining public land owners. A masterplan has not yet been undertaken.

Rather than acting as competitors to the Talbingo and Yarrangobilly MTB trails, it is likely these projects will further enhance the attractiveness of the region to MTB riders, offering a greater variety of trails to experience.

Food, Beverage, Accommodation and Complementary Activities

The Snowy Valleys Destination Management Plan (2018) also revealed a series of accommodation, food and beverage, and complementary activities projects that will aid the ability of the region to support increased tourism; however, many these are in the early stages of concept planning. This includes:

- Riverfront activation masterplan for Tumut
- Brindabella Road upgrade and development of new touring route (access road from Canberra)
- Snowy Valleys Way touring route reinvigoration (new route focusing on exit via Albury/ Wodonga) (complete)
- Contemporary redevelopment of existing caravan parks (underway)
- Adelong main street activation
- Snowy Hydro 2.0 Educational Experience
- Brungle and Snowy Valleys Indigenous Attractions
- Cidery Experience, Batlow
- Rail trail investment including:
 - Tumbarumba to Rosewood Pilot Rail Trail (ongoing)
 - Tumut to Batlow Rail Trail
 - Tumbarumba to Batlow Rail Trail Link
- Tumut River Brewery Destination Development
- Sporting infrastructure upgrades.

Events were also acknowledged as key for attracting visitors to the region. The Snowy Valleys Destination Management Plan indicated potential for new events, such as a road cycling event in Tumbarumba, a mountain biking event in Tumut and Tumbarumba, a Four Seasons in the Snowys food trail event, a food events calendar, and a heritage and culture events calendar (Snowy Valleys Council, 2018).

TRENDS AND INFLUENCING FACTORS

Participation

Whilst there is limited research quantifying the MTB market itself, many studies have been carried out on the broader 'cycling' market, which comprises MTB activity as well as other forms. The nationwide AusPlay survey (2019) indicated that there is a total of approximately 2.3 million cyclists in Australia, of which approximately 626,200 cyclists reside in New South Wales. These cycling estimates refer only to people aged 15 years and over. Studies suggest that mountain biking represents approximately 45% of this, equating to approximately 1.04 million MTB riders in Australia and 281,800 in New South Wales (TRC, 2013).

In terms of the MTB tourism market, national, and international tourism surveys only provide data on general cycling visitation and do not distinguish mountain biking from other forms of cycling. Various sources suggest that mountain biking comprises between 20% to 50% of all cycling tourism activity (TRC Tourism, 2019; TRC Tourism, 2013).

Tourism Research Australia (2020) indicates that the cycling tourism market (visitors that have recorded cycling as an activity on their trip) reached approximately 1.3 million in 2019, of which 29.1% represents those residing in New South Wales. Based on 20% to 50% representing MTB visitors, there were approximately between 268,000 and 670,700 MTB visitors throughout New South Wales in 2019.

Analysis of case study areas, both nationally and internationally, provides an indication of the overall visitation similar trail networks record.

Table A. 1. Annual Mountain Biking Visitation by Trail Network

Trail Network	MTB Visitors Recorded Annually	Trail Network Size (km)
National		
Blue Derby (Tasmania)	30,000 (anticipated to grow to 50,000)	80.0
You Yangs (Victoria)	150,000	50.0
International		
Makara Peak MTB Park (Wellington, New Zealand)	80,000	40.0 plus
Blue Park Wales (Wales, United Kingdom)	60,000	29.5
Rotorua (North Island, New Zealand)	250,000	120.0 plus
Whistler Mountain Bike Park (Canada)	200,000	Over 560.0

Source: Blue Derby (2020), Dirt Art (2018), Thredbo (2020), Mount Buller (2019), You Yangs (2020). Trailforks (2020).

High Growth Industry

Growth in the MTB market is driven by the growing demand for sports and adventure activities. This is occurring as a result of junior participation programs, rising disposable incomes, improving living standards, growth of e-commerce platforms promoting sports, road riding becoming inherently more dangerous, initiatives from government and the private sector, and increasing health awareness.

As estimated previously, there are approximately 1.04 million MTB riders in Australia and approximately 281,800 in New South Wales (TRC, 2013). Mountain Bike Australia (MTBA) is the peak body for mountain biking in Australia, providing services, promoting the sport, and providing a safe and fair environment for competitions. It is beneficial for mountain bikers to become a member of this body, and therefore, membership can be an indicator of growth in the industry.

As of December 2019, the MTBA database exceeds 70,000 individual members, with growth of over 59% in the past five years. This is an indication of strong growth of the MTB market in recent years, which will likely continue.

In line with the significant growth of the MTB market, MTB tourism related activity is also growing. Whilst data limitations make it difficult to estimate the growth of the MTB industry, it has been assumed to trend in line with overall cycling tourism (though representing a smaller share). Tourism Research Australia (2020) indicates that the cycling tourism market (visitors that have recorded cycling as an activity on their trip) has grown by 9.9% nationally

on average per annum over the past 10 years, whilst cycling visitors to New South Wales has grown by 9.7% on average per annum.

As regions throughout Australia continue to record high growth in mountain biking participation and visitation, these regions also record significant growth in trail development. Since 2013, the following destinations have recorded significant investment in trail development due to growth in the industry:

- North Eastern Tasmania (Derby and Blue Tier)
- Mount Buller and Falls Creek in North East Victoria
- East Gippsland
- The Otways in South Western Victoria
- Canberra
- Multiple destinations in New Zealand (TRC Tourism, 2018).

E-Bike Growth

The e-bike market has seen profound growth internationally, with Europe, North America and the Asia Pacific leading the trend. E-bikes have allowed mountain biking to become more adaptable, providing the opportunity for longer rides through the mountains and steeper terrain, all with the same effort as that on the flat ground. Globally, the e-mountain bike market is anticipated to register growth of 6.2% on average per annum between 2020 and 2025 (Mordor Intelligence, 2020).

In Australia, the e-bike category has taken off. In the 2018-19 financial year it was estimated that approximately 32,500 e-bikes were imported into Australia (The Latz Report, 2020). In the current financial year, this number is anticipated to increase by a further 50% to approximately 50,000 e-bikes imported, with a total retail value of approximately \$150 million (assuming an average price of \$3,000). The rate of product development, investment, and consumer acceptance indicates that this market segment is on its way to becoming a mainstream category, as is the case in Europe.

Events

Mountain biking events are becoming increasingly popular throughout Australia. Events range from community-based festivals, to races and national or international championship events. They are a powerful marketing tool, with the potential to significantly enhance the profile of a destination and consequently increase visitation. In the first six months of 2019, over 60 events registered with MTBA were held across Australia (MTBA, 2019).

Popular events currently held in Australia include:

- **Enduro World Series (EWS):** This international race event was held for the first time in Australia in Tasmania in 2019.
- **MTBA National Cup Series:** This event series is a participation-based competition which links all locations in Australia and all levels of competition. It supports competition in cross-country, downhill, marathon, gravity, enduro and State races, In the first six months of 2019 there were approximately 8,000 entries across the 66 events held for this event series (MTBA, 2019).
- **Single Events:** Such as the Dragon Trail (Derby, Tasmania), Snowys Mountain Bike Festival (Snowy Mountains, New South Wales), Fox Superflow (Mt Joyce, Queensland), Crocodile Trophy (Cairns, Queensland), etc.

Events currently hosted by the National Parks and Wildlife Service in New South Wales include Thredbo Australian Open of Mountain Biking, Kanangra Classic, Mountain to Beach, and Dirt Works 100km Classic. There is potential for events like these to be held at Talbingo and Yarrangobilly MTB Trail Network.

A survey conducted by Dirt Art (2016) revealed that over half (55.40%) of respondents stated that they had participated in an organised mountain biking race/ event in the past 12 months, of which the majority participated once or twice a year. The most common race formats were identified as cross country enduro and gravity enduro.

EXISTING AND PROJECTED DEMAND

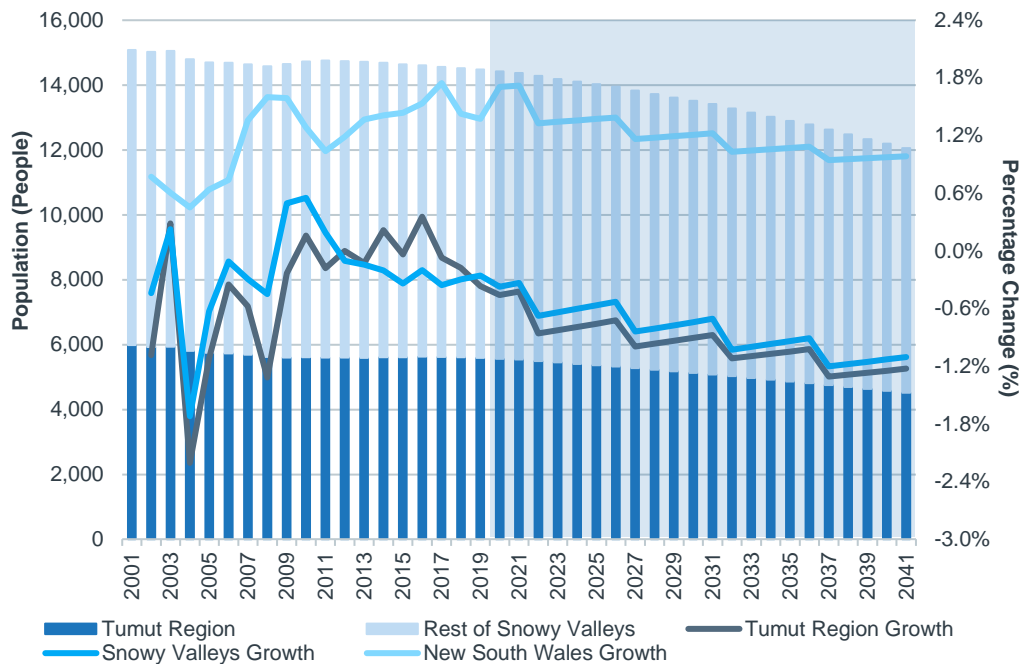
Local Market

Local demand for MTB trails is driven by the size and growth potential of the population and share of the population participating in the sport. The local market has been assumed to comprise residents within the Tumut Region and Tumut Statistical Area 2 (SA2), which represents those that can access the Talbingo and Yarrangobilly MTB Trail Network within an hour of driving. These SA2s are henceforth referred to as the Tumut Region.

Population

Historically, the Tumut Region's population has declined by 0.4% per annum on average between 2001 and 2019, to reach a population of approximately 5,600 people. During summer, the region is bustling with tourists generating economic and business activity, however, it struggles to retain residents and maintain this activity throughout the year. Population projections suggest the resident population in the Tumut Region will continue to decline by 1.0% on average per annum to reach a population of approximately 4,500 people by 2041 (a 1,000 person decline since 2019). The broader Snowy Valleys region is anticipated to experience a similar trend, declining from a population of approximately 14,400 people in 2019 to approximately 12,000 by 2041 (a 2,400 person decline since 2019).

Figure A. 1. Historic and Projected Population, 2001 to 2041



Source: ABS (2020), Transport for New South Wales (2016), Department of Planning, Industry, and Environment (2016).
Notes: The shaded area is representative of the projected population.

The Project is anticipated to assist Talbingo and the broader region with retention of residents, as there will be more business activity, employment opportunities, and recreational activities. This has been evident in the town of Derby, where development of a trail network (opened in 2015) now brings an additional \$30.0 million to the economy each year through induced visitor spend on local businesses, and also caused a property market boom with prices rising by more than 60% since 2015 in neighbouring towns (The Examiner, 2018).

Local Demand Scenarios

The nationwide AusPlay survey (2019) indicated that there is a total of approximately 2.3 million cyclists (aged 15 years and over) in Australia. With a population of approximately 24.9 million, this equates to 92.8 cyclists per 1,000 people in the population. New South Wales recorded approximately 626,200 cyclists (aged 15 years and over) in 2018, and with a population of approximately 7.9 million, this equates to 78.5 cyclists per 1,000 people in the population.

Assuming mountain biking comprises 45% of the total cycling market, New South Wales records approximately 35.3 MTB riders for every 1,000 people in the population, whilst Australia records approximately 41.8 MTB riders for every 1,000 people (ABS,2020; TRC, 2013, Clearing House For Sport, 2019). This indicates that New South Wales has significant potential for growth in terms of the local take-up rates of the sport. Assessment of other States, including the Australian Capital Territory (65.4 MTB riders per 1,000 people), further demonstrated the potential growth of the sport for New South Wales.

Table A. 2. Cycling and MTB Participation Rates, By State

Estimate	NSW	VIC	QLD	WA	NT	ACT	TAS	AUS
Cycling Participation (Number)	626,199	650,776	449,694	286,987	28,542	61,054	36,020	2,319,170
Population (2018)	7,980,168	6,462,019	5,009,424	2,594,181	247,058	420,379	528,298	24,982,688
Cycling Rate Per 1,000 People	78.5	100.7	89.8	110.6	115.5	145.2	68.2	92.8
MTB Rate Per 1,000 People	35.3	45.3	40.4	49.8	52.0	65.4	30.7	41.8

Note: Cycling participation refers only to people aged 15 years and over.
Source: Clearing House for Sport (2019). ABS (2020).

Three scenarios have been assessed in terms of local take-up rates for mountain biking in the Tumut Region:

- Low Growth Scenario: Prior to the trail network becoming operational, there are assumed to be 30.0 MTB riders per 1,000 people in the population.
- Baseline Growth Scenario: Prior to the trail network becoming operational, there are assumed to be 40.0 MTB riders per 1,000 people in the population
- High Growth Scenario: Prior to the trail network becoming operational, there are assumed to be 50.0 MTB riders per 1,000 people in the population.

Local take-up rates have been restricted according to the average MTB rate per 1,000 people of the high performing States other than New South Wales (including Victoria, Queensland, Western Australia, Northern Territory, and the Australian Capital Territory). The level at which the take-up rates are restricted has been maintained from when the restriction level is first reached and for the remainder of the assessment period.

- Low Growth Scenario: Anticipated to reach 37.5 MTB riders per 1,000 people in the population in 2028-29, which remains stable for the remainder of the assessment period.
- Baseline Growth Scenario: Anticipated to reach 50.0 MTB riders per 1,000 people in the population in 2026-27, which remains stable for the remainder of the assessment period.
- High Growth Scenario: Anticipated to reach 62.5 MTB riders per 1,000 people in the population in 2025-26, which remains stable for the remainder of the assessment period.

MTBA membership growth rates have been used as a proxy for anticipated growth in MTB participation (MTBA, 2019). Three growth scenarios have been developed based on the growth rates in membership between financial year 2014 and 2019, as below:

- Low Growth Scenario: 4.6% growth per annum on average from 2022-23 until 2028-29.
- Baseline Growth Scenario: 5.7% growth per annum on average from 2022-23 until 2026-27.
- High Growth Scenario: 6.9% growth per annum on average from 2022-23 until 2025-26.

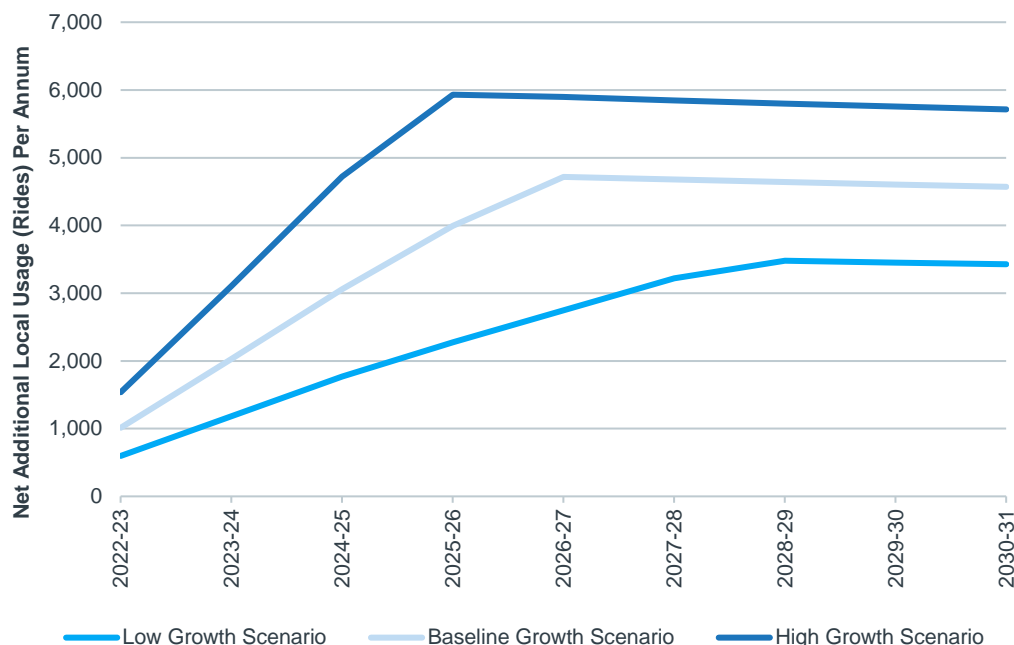
Construction has been assumed to occur in the year ended June 2021 with operations commencing in the year ended June 2022; hence growth occurs from 2022-23 onwards.

Consistent with analysis of the local market, it has been assumed that MTB riders undertake 2 rides per week on average, equating to approximately 130 rides per annum.

The demand projections for local MTB riders have been built based on the above assumptions. It is anticipated that the number of local MTB riders in the Tumut Region will increase from between approximately 140 (low growth)

and 240 (high growth) in 2019 to between approximately 165 (low growth) and 275 (high growth) by 2030. The trail usage per annum (i.e. number of rides) is anticipated to increase from between approximately 14,700 (low growth) and 24,500 (high growth) in 2019-20 to between approximately 17,100 (low growth) and 28,800 (high growth) by 2030-31.

Figure A. 2. Projected Local MTB Rides Per Annum, Tumut Region, 2022-23 to 2030-31



Note: 'Low Growth' refers to the scenario with a low initial take-up rate and low growth. 'Baseline Growth' refers to the scenario with a baseline initial take-up rate and baseline growth. 'High Growth' refers to the scenario with a high initial take-up rate and high growth. Source: ABS (2020), TRC (2013), Clearinghouse for Sport (2019), MTBA (2019).

Tourism Market

Note on data capture and interpretation: Tourism Research Australia (TRA) is the main provider of visitor statistics (including day visitors, domestic and international overnight visitors) for tourism regions and LGAs throughout Australia. Unfortunately, no visitor statistics exist for Talbingo specifically, however statistics exist individually for Tumut Region and, as such, we have drawn on this data as a source of reference.

Tourism demand for MTB trails has been assumed to be driven by the size and growth potential of the cycling tourism market, of which mountain biking comprises a share. The tourism market has been assumed to comprise visitors to the Tumut Region (defined by the Tumut Region SA2 and Tumut SA2), where the trails are located.

Visitation

Since 2005, visitation to the Tumut Region has recorded strong growth of 5.0% per annum on average to reach approximately 286,247 visitors in 2019. The broader Snowy Valleys region has experienced a similar trend, growing by 5.7% per annum on average since 2005. Growth has been predominantly driven by the domestic daytrip market, which also comprises the largest share of visitation to the region (58.0% of Tumut Region visitors). Visitation year to year can be relatively volatile, however, the overall trend indicates that visitation has experienced significant upward growth since 2005. This is likely due to the development of major tourism activities, including those in the Snowy Hydro.

Visitor projections for **the Tumut Region and broader Snowy Valleys** are not available, however, Tourism Research Australia projections at the State and National level can provide an indication of the direction of projected visitation growth in the region. In developing projections AEC has applied projected visitor growth for **New South Wales** to the estimate for 2019 to project future visitation in the region. It should be noted that visitation in the near term is expected to fall below that shown due to impacts from COVID-19, however, in the longer term this projection

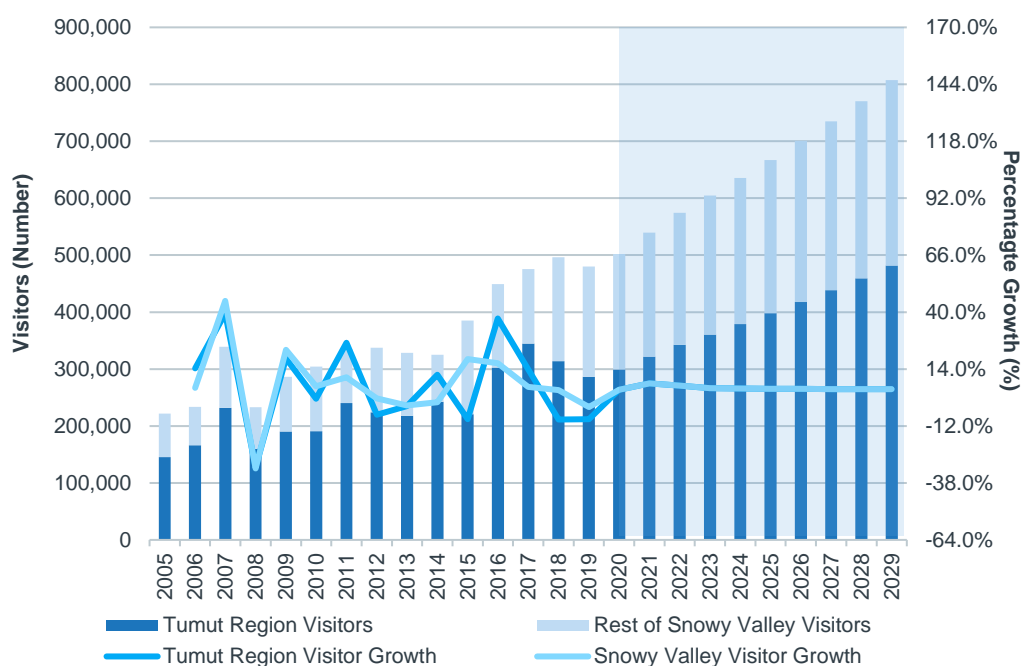
may be considered a reasonable expectation for visitor growth should tourism visitation growth return to pre-COVID-19 levels.

New South Wales tourism projections suggests:

- The domestic daytrip and overnight trip visitor markets will record the strongest growth to 2029 (5.3% per annum on average)
- The international visitor market will grow by 1.1% to 2029.

Based on this approach, total visitation is anticipated to reach approximately 481,400 people in the Tumut Region and 807,100 in the broader Snowy Valleys region by 2029, representing the potential market for visitor activity at the Talbingo and Yarrangobilly MTB Trail Network.

Figure A. 3. Historic and Projected Visitation, 2005 to 2029



Source: TRA (2020 a, b, c).

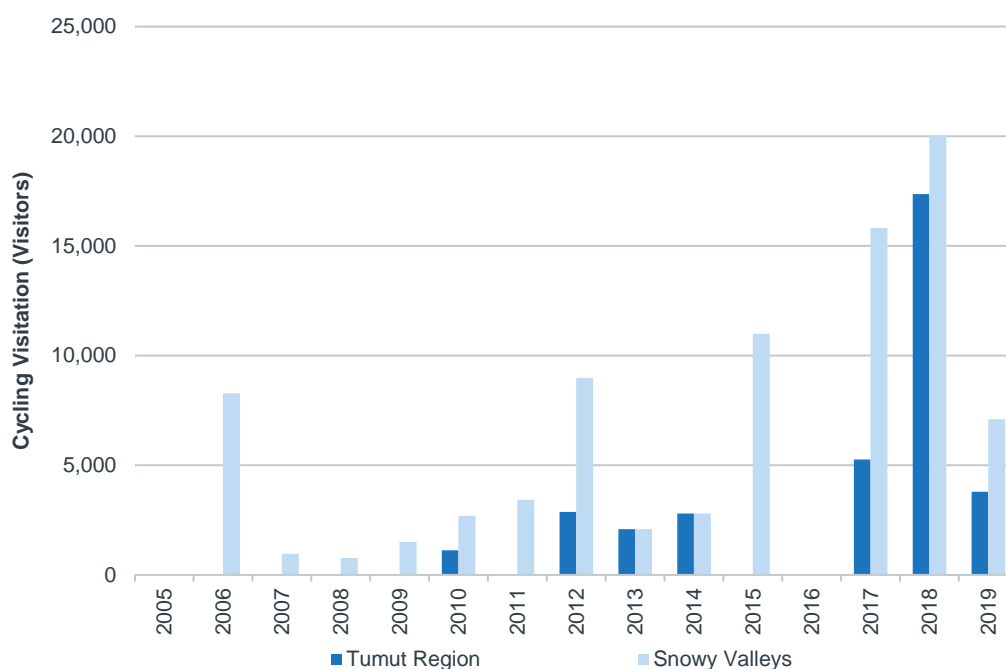
Local consultation suggests that visitation to the town of Talbingo specifically has declined in recent years, likely due to the decline in repeat visitation year on year. Repeat visitation has declined in recent years due to capacity restrictions for use of the Dam (i.e. how many boats can be on the Dam), as well as the bushfires and destruction caused.

Cycling Visitation

Minimal cycling visitation has been recorded in the Tumut Region since 2005. Activity was primarily driven by the domestic overnight market and is likely related to event activity in the region such as the Tumut Cycle Classic. Therefore, this activity is likely not related to MTB riding. The broader Snowy Valleys region has recorded higher cycling visitation activity, particularly in 2017 and 2018 where cycling visitation recorded a peak of between (15,000 and 20,000). Despite the volatility recorded year on year, a positive trend is evident overall. With further investment in attraction of cycling visitors, it will be possible for the positive trend to be sustained.

Furthermore, analysis of the Australian Capital Territory self-drive (domestic overnight) holiday market indicates that participation in cycling activities has increased from an average of 2.8% of the total self-drive (domestic overnight) market between 2010 and 2014, to an average of 4.8% between 2015 and 2019 (TRA, 2020d). This State is a key potential market for the Talbingo and Yarrangobilly MTB Trail Network development and reveals growing demand.

Figure A. 4. Cycling Visitation, 2005 to 2019



Source: TRA (2020a, b).

Case Study Comparisons

Case study analysis has been undertaken for four popular mountain biking destinations, to provide an indication of the potential visitor activity the Project may generate. Below provides a summary of each region's MTB trails, as well as key takeaways in terms of demand for the trails.

- Derby (Tasmania):** Blue Derby is home to more than 80 kilometres of purpose-built mountain bike trails and is widely regarded as the mountain biking capital of Australia. The trail network has found itself on the international radar, having been the first destination in Australia to hold the Enduro World Series competition (2019). The trail network attracts more than 30,000 visitors annually (Blue Derby, 2020). Tourism Research Australia data indicates that prior to the initial development of the trail network, Derby (Scottsdale – Birdport SA2) attracted approximately 6,000 cycling visitors per annum on average (TRA, 2020a, b). In more recent years, Derby has attracted an average of 29,200 cycling visitors per annum (**growth of 22,800 cycling visitors** since before investment). This growth can primarily be attributed to MTB visitors. Visitation to Blue Derby is still in a significant growth stage, with annual usage of the trail network anticipated to grow to 50,000.
- Jindabyne (New South Wales):** Jindabyne is a popular destination for MTB riders, having various trails located alongside the lake and through the mountains. Jindabyne has also benefited from the significant investment in the nearby Thredbo Bike Park, which has attracted more riders to the area. Tourism Research Australia data indicates that prior to the initial trail investment, Jindabyne (Jindabyne – Berridale SA2) attracted an average of 16,600 cycling visitors per annum on average (TRA, 2020a, b). In more recent years, Jindabyne has attracted an average of 38,100 cycling visitors per annum (**growth of 21,400 cycling visitors** since before investment). This growth can primarily be attributed to MTB visitors. Jindabyne provides an indication of a more mature cycling tourism market.
- You Yangs (Victoria):** The You Yangs trail network comprises over 50 kilometres of trails, attracting more than 150,000 visitors annually (You Yangs, 2020). MTB trails have been around in You Yangs for over a decade, and as such, it is a well-established destination for riding. Tourism Research Australia data indicates that prior to the initial trail investment, You Yangs (Lara SA2) attracted approximately 168,300 cycling visitors per annum on average (TRA, 2020a, b). In more recent years, this has increased to approximately 262,400 (**growth of 96,100 cycling visitors** since before investment). You Yangs provides an indication of a more mature cycling tourism market. It is likely that the majority of visitors come from Melbourne, as there are limited trail networks on offer around the area.

- **Stromlo (ACT):** Stromlo Forest Park has become a world-class sporting facility, attracting high profile events such as the World Mountain Bike and Trial Championships in 2009. Since this event, visitation to the park has increased significantly, with approximately 167,000 visitors recorded in 2013 (ACT Government, 2013). Prior to development of the park, Tourism Research Australia data indicates the area (ACT – South West SA2) attracted just 200 cycling visitors. Since development of the park, the area attracts an average of 8,000 visitors per annum (**an increase of 7,800 cycling visitors** since before investment). This growth can primarily be attributed to MTB visitors.

Further to the above, the Tumbarumba to Rosewood Rail Trail has recently reached 12,000 users since opening in April 2020. It can be expected that similar success be recorded for the Talbingo and Yarrangobilly trails.

The case studies of Derby and Jindabyne are considered to be the most appropriate reflection of what may be achievable for the Talbingo and Yarrangobilly trails. These case studies indicate growth of more than 20,000 visitors participating in cycling activities since the trails were developed. However, not all of this increase may be due to usage of the MTB trails themselves (though likely the majority is). It has been assumed that the 96,100 growth in visitation to You Yangs is largely due to the limited number of trails available for use around Melbourne, and hence the high visitation to the one area. Conversely, the Snowy Valleys region (and surrounds) has an array of mountain biking opportunities on offer.

Based on these case studies, it may reasonably be expected that the Talbingo and Yarrangobilly Trail Network could potentially result in an increase in visitation of between approximately 15,000 and 22,500 for visitors using the MTB trails.

Tourism Demand Scenarios

The Project is anticipated to become one of Australia's most popular mountain biking trail networks, having the longest descending trail in Australia of 15 kilometres in length and 1,000 vertical metres. The Project has the potential to increase visitation through increasing participation in MTB activities for visitors that would **not** otherwise undertake MTB activities (non-core market), as well as attract additional visitation to the region solely for mountain biking purposes (core market).

Case study analysis indicated that it is reasonable for the Project to result in increased cycling visitation of between approximately 15,000 and 25,000 visitors. It has been assumed that 75% of this related to MTB activities. This has been modelled as under three scenarios:

- Low Growth: 20,000 additional cycling visitors (15,000 additional MTB visitors) over the first three years of operation, with 25% occurring in 2022-23, increasing to 70% in 2023-24 and 100% in 2024-25.
- Baseline Growth: 25,000 additional cycling visitors (18,750 additional MTB visitors) over the first three years of operation, with 25% occurring in 2022-23, increasing to 70% in 2023-24 and 100% in 2024-25.
- High Growth: 30,000 additional cycling visitors (22,500 additional MTB visitors) over the first three years of operation, with 25% occurring in 2022-23, increasing to 70% in 2023-24 and 100% in 2024-25.

MTB visitation is then be expected to trend in line with visitation growth from 2024-25 onwards. Three visitation growth scenarios have been investigated:

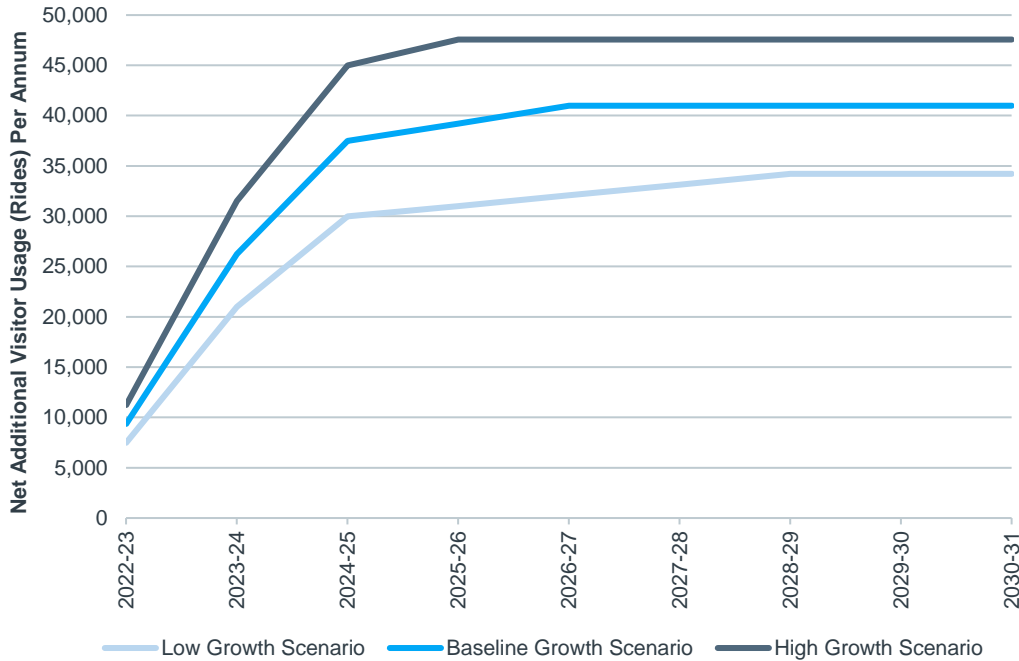
- Low Growth: Trends 25% lower than New South Wales visitation growth from 2024-25 until 2028-19 where it is anticipated to stabilise.
- Baseline Growth: Trends in line with New South Wales visitation growth from 2024-25 until 2026-27 where it is anticipated to stabilise.
- High Growth: Trends 25% higher than New South Wales visitation growth from 2024-25 until 2025-26 where it is anticipated to stabilise.

It has been assumed that 55% of the visitor increase are daytrip visitors; these visitors are expected to be primarily those travelling from Canberra and Melbourne to the trails. Domestic overnight visitors have been assumed to represent 40% of the visitor increase, and international representing 5%. Previous research indicates that domestic

overnight visitors undertake between 2-5 rides per trip (3 assumed), whilst international visitors have been assumed the undertake 5 rides per trip, and domestic daytrip visitors just 1 ride (TRC Tourism, 2015, TRC Tourism, 2019).

Based on these assumptions, trail usage is anticipated to reach between approximately 7,500 (low growth) and 11,250 (high growth) rides per annum in 2022 and grow to between approximately 34,200 (low growth) and 47,500 (high growth) rides per annum by 2030-31.

Figure A. 5. Visitor Usage (Rides) Per Annum, 2022-23 to 2030-31

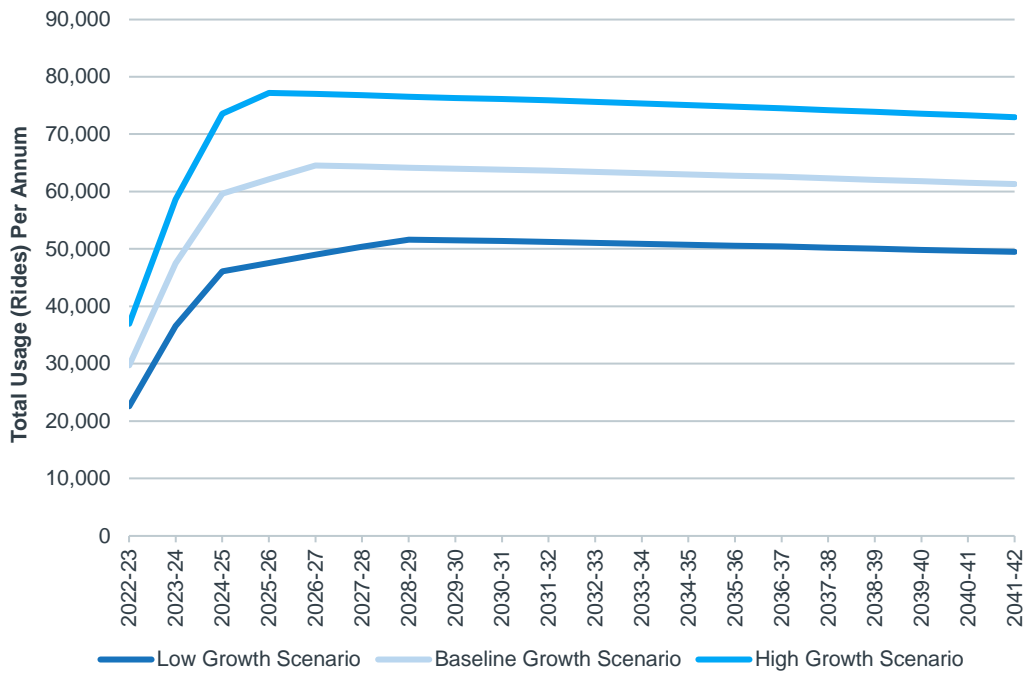


Source: TRA (2020a, b, c), TRC (2013).

Overall Demand Outcomes

Total trail usage (including local and visitor usage) is anticipated to reach between approximately 22,500 (low growth) and 37,000 (high growth) rides per annum in 2022-23 and grow to between approximately 49,400 (low growth) and 73,000 (high growth) rides per annum by 2041-42. The overall demand outcomes decline from 2030-31 to 2041-42 due to visitation demand stabilising whilst local demand declines slightly with the projected population decline.

Figure. A 1. Total Usage (Rides) Per Annum, 2022 to 2030



Source: TRA (2020a, 2020b, 2020c), TRC (2013).

APPENDIX B: INPUT-OUTPUT METHODOLOGY

INPUT-OUTPUT MODEL OVERVIEW

Input-Output analysis demonstrates inter-industry relationships in an economy, depicting how the output of one industry is purchased by other industries, households, the government and external parties (i.e. exports), as well as expenditure on other factors of production such as labour, capital and imports. Input-Output analysis shows the direct and indirect (flow-on) effects of one sector on other sectors and the general economy. As such, Input-Output modelling can be used to demonstrate the economic contribution of a sector on the overall economy and how much the economy relies on this sector or to examine a change in final demand of any one sector and the resultant change in activity of its supporting sectors.

The economic contribution can be traced through the economic system via:

- **Direct impacts**, which represent the economic activity of the industry experiencing the stimulus.
- **Flow-on impacts**, which are disaggregated to:
 - **Industry Support Effects (Type I)**, which comprise the effects from direct expenditure on goods and services by the industry experiencing the stimulus (direct suppliers to the industry), as well as the second and subsequent round effects of increased purchases by suppliers in response to increased sales.
 - **Household Consumption Effects (Type II)**, which represent the consumption induced activity from additional household expenditure on goods and services resulting from additional wages and salaries being paid within the economic system.

These effects can be identified through the examination of four types of impacts:

- **Output:** Refers to the gross value of goods and services transacted, including the costs of goods and services used in the development and provision of the final product. Output typically overstates the economic impacts as it counts all goods and services used in one stage of production as an input to later stages of production, hence counting their contribution more than once.
- **Gross product:** Refers to the value of output after deducting the cost of goods and services inputs in the production process. Gross product (e.g., Gross Regional Product) defines a true net economic contribution and is subsequently the preferred measure for assessing economic impacts.
- **Income:** Measures the level of wages and salaries paid to employees of the industry under consideration and to other industries benefiting from the project.
- **Employment:** Refers to the part-time and full-time employment positions generated by the economic shock, both directly and indirectly through flow-on activity, and is expressed in terms of full time equivalent (FTE) positions.

Input-Output multipliers can be derived from open (Type I) Input-Output models or closed (Type II) models. Open models show the direct effects of spending in a particular industry as well as the indirect or flow-on (industrial support) effects of additional activities undertaken by industries increasing their activity in response to the direct spending.

Closed models re-circulate the labour income earned as a result of the initial spending through other industry and commodity groups to estimate consumption induced effects (or impacts from increased household consumption).

MODEL DEVELOPMENT

Multipliers used in this assessment are derived from sub-regional transaction tables developed specifically for this project. The process of developing a sub-regional transaction table involves developing regional estimates of gross production and purchasing patterns based on a parent table, in this case, the 2014-15 Australian transaction table (ABS, 2017b).

Estimates of gross production (by industry) in the study areas were developed based on the percent contribution to employment (by place of work) of the study areas to the Australian economy (ABS, 2012; ABS, 2017a), and applied to Australian gross output identified in the 2014-15 Australian table.

Industry purchasing patterns within the study area were estimated using a process of cross industry location quotients and demand-supply pool production functions as described in West (1993).

Where appropriate, values were rebased from 2014-15 (as used in the Australian national IO transaction tables) to 2017-18 values using the Consumer Price Index (ABS, 2018c).

MODELLING ASSUMPTIONS

The key assumptions and limitations of Input-Output analysis include:

- **Lack of supply-side constraints:** The most significant limitation of economic impact analysis using Input-Output multipliers is the implicit assumption that the economy has no supply-side constraints so the supply of each good is perfectly elastic. That is, it is assumed that extra output can be produced in one area without taking resources away from other activities, thus overstating economic impacts. The actual impact is likely to be dependent on the extent to which the economy is operating at or near capacity.
- **Fixed prices:** Constraints on the availability of inputs, such as skilled labour, require prices to act as a rationing device. In assessments using Input-Output multipliers, where factors of production are assumed to be limitless, this rationing response is assumed not to occur. The system is in equilibrium at given prices, and prices are assumed to be unaffected by policy and any crowding out effects are not captured. This is not the case in an economic system subject to external influences.
- **Fixed ratios for intermediate inputs and production (linear production function):** Economic impact analysis using Input-Output multipliers implicitly assumes that there is a fixed input structure in each industry and fixed ratios for production. That is, the input function is generally assumed linear and homogenous of degree one (which implies constant returns to scale and no substitution between inputs). As such, impact analysis using Input-Output multipliers can be seen to describe average effects, not marginal effects. For example, increased demand for a product is assumed to imply an equal increase in production for that product. In reality, however, it may be more efficient to increase imports or divert some exports to local consumption rather than increasing local production by the full amount. Further, it is assumed each commodity (or group of commodities) is supplied by a single industry or sector of production. This implies there is only one method used to produce each commodity and that each sector has only one primary output.
- **No allowance for economies of scope:** The total effect of carrying on several types of production is the sum of the separate effects. This rules out external economies and diseconomies and is known simply as the “additivity assumption”. This generally does not reflect real world operations.
- **No allowance for purchasers’ marginal responses to change:** Economic impact analysis using multipliers assumes that households consume goods and services in exact proportions to their initial budget shares. For example, the household budget share of some goods might increase as household income increases. This equally applies to industrial consumption of intermediate inputs and factors of production.
- **Absence of budget constraints:** Assessments of economic impacts using multipliers that consider consumption induced effects (type two multipliers) implicitly assume that household and government consumption is not subject to budget constraints.

Despite these limitations, Input-Output techniques provide a solid approach for taking account of the inter-relationships between the various sectors of the economy in the short-term and provide useful insight into the quantum of final demand for goods and services, both directly and indirectly, likely to be generated by a project.

In addition to the general limitations of Input-Output Analysis, there are two other factors that need to be considered when assessing the outputs of sub-regional transaction table developed using this approach, namely:

- It is assumed the sub-region has similar technology and demand/ consumption patterns as the parent (Australia) table (e.g. the ratio of employee compensation to employees for each industry is held constant).

- Intra-regional cross-industry purchasing patterns for a given sector vary from the national tables depending on the prominence of the sector in the regional economy compared to its input sectors. Typically, sectors that are more prominent in the region (compared to the national economy) will be assessed as purchasing a higher proportion of imports from input sectors than at the national level, and vice versa.

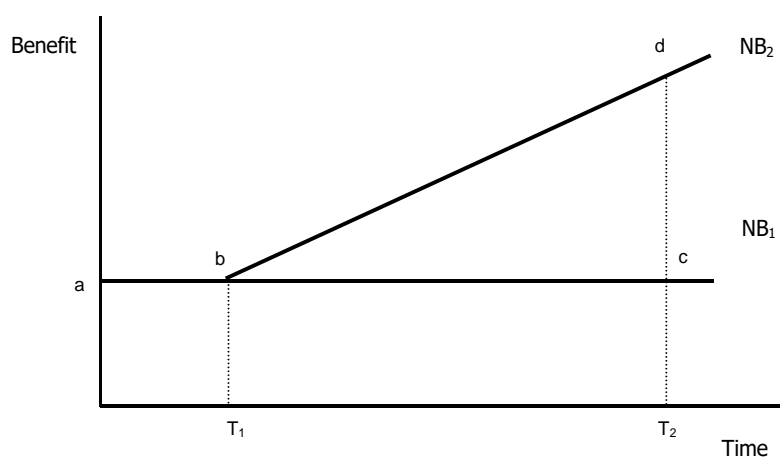
APPENDIX C: CBA METHODOLOGY

STEP 1: DEFINE THE SCOPE AND BOUNDARY

To enable a robust determination of the net benefits of undertaking a given project, it is necessary to specify base case and alternative case scenarios. The base case scenario represents the 'without project' scenario and the alternative or 'with project' scenario examines the impact with the project in place.

The base case (without) scenario is represented by line NB_1 (bc) over time T_1 to T_2 in the figure below. The investment in the project at time T_1 is likely to generate a benefit, which is represented by line NB_2 (bd). Therefore, the net benefit flowing from investment in the project is identified by calculating the area (bcd) between NB_1 and NB_2 .

Figure C.1. With and Without Scenarios



Source: AEC.

STEP 2: IDENTIFY COSTS AND BENEFITS

A comprehensive quantitative specification of the benefits and costs included in the evaluation and their various timings is required and includes a clear outline of all major underlying assumptions. These impacts, both positive and negative, are then tabulated and where possible valued in dollar terms.

Some impacts may not be quantifiable. Where this occurs the impacts and their respective magnitudes will be examined qualitatively for consideration in the overall analysis.

Financing costs are not included in a CBA. As a method of project appraisal, CBA examines a project's profitability independently of the terms on which debt finance is arranged. This does not mean, however, that the cost of capital is not considered in CBA, as the capital expenses are included in the year in which the transaction occurs, and the discount rate (discussed below in Step 5) should be selected to provide a good indication of the opportunity cost of funds, as determined by the capital market.

STEP 3: QUANTIFY AND VALUE COSTS AND BENEFITS

CBA attempts to measure the value of all costs and benefits that are expected to result from the activity in economic terms. It includes estimating costs and benefits that are 'unpriced' and not the subject of normal market transactions, but which nevertheless entail the use of real resources. These attributes are referred to as 'non-market' goods or impacts. In each of these cases, quantification of the effects in money terms is an important part of the evaluation.

However, projects frequently have non-market impacts that are difficult to quantify. Where the impact does not have a readily identifiable dollar value, proxies and other measures should be developed as these issues represent real costs and benefits.

One commonly used method of approximating values for non-market impacts is 'benefit transfer'. Benefit transfer (BT) means taking already calculated values from previously conducted studies and applying them to different study sites and situations. In light of the significant costs and technical skills needed in using the methodologies outlined in the table above, for many policy makers utilising BT techniques can provide an adequate solution.

Context is extremely important when deciding which values to transfer and from where. Factors such as population, number of households, and regional characteristics should be considered when undertaking benefit transfer. For example, as population density increases over time, individual households may value nearby open space and parks more highly. Other factors to be considered include, depending on the location of the original study, utilising foreign exchange rates, demographic data, and respective inflation rates.

Benefit transfer should only be regarded as an approximation. Transferring values from similar regions with similar markets is important, and results can be misleading if values are transferred between countries that have starkly different economies (for example a benefit transfer from the Solomon Islands to Vancouver would likely have only limited applicability). However, sometimes only an indicative value for environmental assets is all that is required.

STEP 4: TABULATE ANNUAL COSTS AND BENEFITS

All identified and quantified benefits and costs are tabulated to identify where and how often they occur. Tabulation provides an easy method for checking that all the issues and outcomes identified have been addressed and provides a picture of the flow of costs, benefits, and their sources.

STEP 5: CALCULATE THE NET BENEFIT IN DOLLAR TERMS

As costs and benefits are specified over time it is necessary to reduce the stream of benefits and costs to present values. The present value concept is based on the time value of money – the idea that a dollar received today is worth more than a dollar to be received in the future. The present value of a cash flow is the equivalent value of the future cashflow should the entire cashflow be received today. The time value of money is determined by the given discount rate to enable the comparison of options by a common measure.

The selection of appropriate discount rates is of particular importance because they apply to much of the decision criteria and consequently the interpretation of results. The higher the discount rate, the less weight or importance is placed on future cash flows.

The choice of discount rates should reflect the weighted average cost of capital (WACC). For this analysis, a base discount rate of 7% has been used to represent the minimum rate of return, in line with Australian Government guidelines. As all values used in the CBA are in real terms, the discount rate does not incorporate inflation (i.e., it is a real discount rate, as opposed to a nominal discount rate).

To assess the sensitivity of the project to the discount rate used, discount rates either side of the base discount rate (7%) have also been examined (4% and 10%).

The formula for determining the present value is:

$$PV = \frac{FV_n}{(1 + r)^n}$$

Where:

PV = present value today

FV = future value *n* periods from now

r = discount rate per period

n = number of periods

Extending this to a series of cash flows the present value is calculated as:

$$PV = \frac{FV_1}{(1+r)^1} + \frac{FV_2}{(1+r)^2} + \dots + \frac{FV_n}{(1+r)^n}$$

Once the stream of costs and benefits have been reduced to their present values the Net Present Value (NPV) can be calculated as the difference between the present value of benefits and present value of costs. If the present value of benefits is greater than the present value of costs, then the option or project would have a net economic benefit.

In addition to the NPV, the internal rate of return (IRR) and benefit-cost ratio (BCR) can provide useful information regarding the attractiveness of a project. The IRR provides an estimate of the discount rate at which the NPV of the project equals zero, i.e., it represents the maximum WACC at which the project would be deemed desirable. However, in terms of whether a project is considered desirable or not, the IRR and BCR will always return the same result as the NPV decision criterion.

STEP 6: SENSITIVITY ANALYSIS

Sensitivity analysis allows for the testing of the key assumptions and the identification of the critical variables within the analysis to gain greater insight into the drivers to the case being examined.

A series of Monte Carlo analyses has been conducted in order to test the sensitivity of the model outputs to changes in key variables. Monte Carlo simulation is a computerised technique that provides decision-makers with a range of possible outcomes and the probabilities they will occur for any choice of action. Monte Carlo simulation works by building models of possible results by substituting a range of values – the probability distribution – for any factor that has inherent uncertainty. It then calculates results over and over, each time using a different set of random values from the probability functions. The outputs from Monte Carlo simulation are distributions of possible outcome values.

During a Monte Carlo simulation, values are sampled at random from the input probability distributions. Each set of samples is called an iteration, and the resulting outcome from that sample is recorded. Monte Carlo simulation does this hundreds or thousands of times, and the result is a probability distribution of possible outcomes. In this way, Monte Carlo simulation provides a comprehensive view of what may happen. It describes what could happen and how likely it is to happen.

APPENDIX D: FINANCIAL ANALYSIS

LOW GROWTH SCENARIO: OPERATING PERFORMANCE

Project Profit & Loss	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Operating Revenue	40,612	53,397	63,131	66,740	70,475	74,306	76,884	78,278	79,703	81,163
Labour, Materials and Services Costs	13,005	13,530	14,072	69,557	70,948	72,367	114,823	117,119	119,461	78,333
EBITDA	27,607	39,866	49,060	-2,817	-473	1,939	-37,938	-38,842	-39,758	2,830
Depreciation Charges	153,791	428,424	572,202	430,646	439,259	448,044	457,005	466,145	475,468	484,977
EBIT	-126,185	-388,557	-523,142	-433,463	-439,732	-446,105	-494,943	-504,986	-515,226	-482,147
Interest Expense (borrowings)	0	0	0	0	0	0	0	0	0	0
Interest Revenue/(Expense) on Cash Holdings	276	956	1,865	2,364	2,379	2,441	2,130	1,405	647	290
Operating Surplus/(Deficit) (or NPBT)	-125,909	-387,601	-521,277	-431,098	-437,353	-443,664	-492,813	-503,582	-514,579	-481,856

LOW GROWTH SCENARIO: CASH FLOW

Project Cash Flow Statement	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cash Flows from Operational Activities											
Operating Revenue	\$ -	\$ 40,612	\$ 53,397	\$ 63,131	\$ 66,740	\$ 70,475	\$ 74,306	\$ 76,884	\$ 78,278	\$ 79,703	\$ 81,163
Capital Revenue	\$ 355,827	\$ 4,650,432	\$ 3,640,262	\$ 162,365	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Labour, Materials and Services Costs	\$ -	\$ (13,005)	\$ (13,530)	\$ (14,072)	\$ (69,557)	\$ (70,948)	\$ (72,367)	\$ (114,823)	\$ (117,119)	\$ (119,461)	\$ (78,333)
Interest Expense	\$ -	\$ 276	\$ 956	\$ 1,865	\$ 2,364	\$ 2,379	\$ 2,441	\$ 2,130	\$ 1,405	\$ 647	\$ 290
Net Cash Flows from Operations	\$ 355,827	\$ 4,678,315	\$ 3,681,084	\$ 213,289	\$ (453)	\$ 1,906	\$ 4,380	\$ (35,809)	\$ (37,437)	\$ (39,111)	\$ 3,120
Cash Flows from Investing Activities											
Purchase of Infrastructure, Property, Plant & Equipment	\$ (355,827)	\$ (4,650,432)	\$ (3,640,262)	\$ (162,365)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Cash Flows from Investing Activities	\$ (355,827)	\$ (4,650,432)	\$ (3,640,262)	\$ (162,365)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Cash Flows from Financing Activities											
Working Capital Contribution	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Proceeds from Borrowings	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repayment of Borrowings	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Cash Flows from Financing Activities	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Increase/(Decrease) in Cash & Cash Equivalents	\$ -	\$ 27,883	\$ 40,823	\$ 50,925	\$ (453)	\$ 1,906	\$ 4,380	\$ (35,809)	\$ (37,437)	\$ (39,111)	\$ 3,120
Opening Cash Balance	\$ -	\$ -	\$ 27,883	\$ 68,705	\$ 119,630	\$ 119,177	\$ 121,083	\$ 125,463	\$ 89,654	\$ 52,217	\$ 13,106
Closing Cash Balance	\$ -	\$ 27,883	\$ 68,705	\$ 119,630	\$ 119,177	\$ 121,083	\$ 125,463	\$ 89,654	\$ 52,217	\$ 13,106	\$ 16,226

BASELINE SCENARIO: OPERATING PERFORMANCE

Project Profit & Loss	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Operating Revenue	46,941	62,842	74,945	79,740	84,566	87,202	88,748	90,331	91,951	93,610
Labour, Materials and Services Costs	13,005	13,530	14,072	69,557	70,948	72,367	114,823	117,119	119,461	78,333
EBITDA	33,936	49,311	60,873	10,183	13,618	14,835	-26,074	-26,788	-27,510	15,278
Depreciation Charges	153,791	428,424	572,202	430,646	439,259	448,044	457,005	466,145	475,468	484,977
EBIT	-119,855	-379,112	-511,328	-420,462	-425,641	-433,209	-483,079	-492,933	-502,978	-469,699
Interest Expense (borrowings)	0	0	0	0	0	0	0	0	0	0
Interest Revenue/(Expense) on Cash Holdings	339	1,179	2,304	3,061	3,360	3,712	3,673	3,218	2,740	2,672
Operating Surplus/(Deficit) (or NPBT)	-119,516	-377,934	-509,024	-417,402	-422,281	-429,497	-479,406	-489,715	-500,238	-467,027

BASELINE SCENARIO: CASH FLOW

Project Cash Flow Statement	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cash Flows from Operational Activities											
Operating Revenue	\$ -	\$ 46,941	\$ 62,842	\$ 74,945	\$ 79,740	\$ 84,566	\$ 87,202	\$ 88,748	\$ 90,331	\$ 91,951	\$ 93,610
Capital Revenue	\$ 355,827	\$ 4,650,432	\$ 3,640,262	\$ 162,365	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Labour, Materials and Services Costs	\$ -	\$ (13,005)	\$ (13,530)	\$ (14,072)	\$ (69,557)	\$ (70,948)	\$ (72,367)	\$ (114,823)	\$ (117,119)	\$ (119,461)	\$ (78,333)
Interest Expense	\$ -	\$ 339	\$ 1,179	\$ 2,304	\$ 3,061	\$ 3,360	\$ 3,712	\$ 3,673	\$ 3,218	\$ 2,740	\$ 2,672
Net Cash Flows from Operations	\$ 355,827	\$ 4,684,708	\$ 3,690,752	\$ 225,542	\$ 13,244	\$ 16,978	\$ 18,547	\$ (22,401)	\$ (23,570)	\$ (24,771)	\$ 17,950
Cash Flows from Investing Activities											
Purchase of Infrastructure, Property, Plant & Equipment	\$ (355,827)	\$ (4,650,432)	\$ (3,640,262)	\$ (162,365)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Cash Flows from Investing Activities	\$ (355,827)	\$ (4,650,432)	\$ (3,640,262)	\$ (162,365)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Cash Flows from Financing Activities											
Working Capital Contribution	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Proceeds from Borrowings	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repayment of Borrowings	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Cash Flows from Financing Activities	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Increase/(Decrease) in Cash & Cash Equivalents	\$ -	\$ 34,276	\$ 50,490	\$ 63,178	\$ 13,244	\$ 16,978	\$ 18,547	\$ (22,401)	\$ (23,570)	\$ (24,771)	\$ 17,950
Opening Cash Balance	\$ -	\$ -	\$ 34,276	\$ 84,766	\$ 147,943	\$ 161,187	\$ 178,165	\$ 196,712	\$ 174,311	\$ 150,741	\$ 125,970
Closing Cash Balance	\$ -	\$ 34,276	\$ 84,766	\$ 147,943	\$ 161,187	\$ 178,165	\$ 196,712	\$ 174,311	\$ 150,741	\$ 125,970	\$ 143,920

HIGH GROWTH SCENARIO: OPERATING PERFORMANCE

Project Profit & Loss	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Operating Revenue	53,372	72,507	87,117	93,094	95,918	98,730	100,457	102,226	104,037	105,893
Labour, Materials and Services Costs	13,005	13,530	14,072	69,557	70,948	72,367	114,823	117,119	119,461	78,333
EBITDA	40,367	58,977	73,046	23,537	24,969	26,363	-14,366	-14,893	-15,424	27,561
Depreciation Charges	153,791	428,424	572,202	430,646	439,259	448,044	457,005	466,145	475,468	484,977
EBIT	-113,424	-369,447	-499,156	-407,108	-414,289	-421,681	-471,370	-481,038	-490,892	-457,416
Interest Expense (borrowings)	0	0	0	0	0	0	0	0	0	0
Interest Revenue/(Expense) on Cash Holdings	404	1,405	2,754	3,774	4,335	4,935	5,154	4,964	4,760	4,977
Operating Surplus/(Deficit) (or NPBT)	-113,021	-368,042	-496,403	-403,334	-409,954	-416,746	-466,217	-476,074	-486,131	-452,439

HIGH GROWTH SCENARIO: CASH FLOW

Project Cash Flow Statement	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cash Flows from Operational Activities											
Operating Revenue	\$ -	\$ 53,372	\$ 72,507	\$ 87,117	\$ 93,094	\$ 95,918	\$ 98,730	\$ 100,457	\$ 102,226	\$ 104,037	\$ 105,893
Capital Revenue	\$ 355,827	\$ 4,650,432	\$ 3,640,262	\$ 162,365	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Labour, Materials and Services Costs	\$ -	\$ (13,005)	\$ (13,530)	\$ (14,072)	\$ (69,557)	\$ (70,948)	\$ (72,367)	\$ (114,823)	\$ (117,119)	\$ (119,461)	\$ (78,333)
Interest Expense	\$ -	\$ 404	\$ 1,405	\$ 2,754	\$ 3,774	\$ 4,335	\$ 4,935	\$ 5,154	\$ 4,964	\$ 4,760	\$ 4,977
Net Cash Flows from Operations	\$ 355,827	\$ 4,691,203	\$ 3,700,644	\$ 238,164	\$ 27,312	\$ 29,304	\$ 31,298	\$ (9,212)	\$ (9,929)	\$ (10,664)	\$ 32,538
Cash Flows from Investing Activities											
Purchase of Infrastructure, Property, Plant & Equipment	\$ (355,827)	\$ (4,650,432)	\$ (3,640,262)	\$ (162,365)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Cash Flows from Investing Activities	\$ (355,827)	\$ (4,650,432)	\$ (3,640,262)	\$ (162,365)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Cash Flows from Financing Activities											
Working Capital Contribution	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Proceeds from Borrowings	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repayment of Borrowings	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Cash Flows from Investing Activities	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Increase/(Decrease) in Cash & Cash Equivalents	\$ -	\$ 40,771	\$ 60,382	\$ 75,799	\$ 27,312	\$ 29,304	\$ 31,298	\$ (9,212)	\$ (9,929)	\$ (10,664)	\$ 32,538
Opening Cash Balance	\$ -	\$ 40,771	\$ 101,153	\$ 176,952	\$ 204,263	\$ 233,568	\$ 264,866	\$ 255,654	\$ 245,724	\$ 235,061	
Closing Cash Balance	\$ -	\$ 40,771	\$ 101,153	\$ 176,952	\$ 204,263	\$ 233,568	\$ 264,866	\$ 255,654	\$ 245,724	\$ 235,061	\$ 267,598

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OUTCOME DRIVEN



Appendix E – Trail design and development elements and considerations

Project Elements – Talbingo Precinct

Area	Existing (ok)	Trail (km)	Raised Platform (m)	Rock Armour (m)	Switch back (#)	Rock Outcrop (m)	other
Big Talbingo Descent	-	15	48 (6)	12 (7)	57	720	
Big Talbingo Climb	4 (OK)	10.1	18 (4)	3 (1)	18	160	
Old Mountain Climb	-	5.4	47 (12)	14 (9)	19	170	
Old Mountain Descent	-	4.9	38 (10)	-	21	50	
Old Mountain Links	-	4.1	6 (2)	-	10	-	
Crossing 2-3 climb	-	5.6	8 (4)	-	8	-	70m view platform
Crossing 2-3 descent	-	6.1	30 (7)	2 (1)	2	-	
TOTAL	(4km)	51.2km	195m (43)	31m (18)	135	1100m	*

Project Elements – Yarrangobilly Precinct

Area	Existing (ok)	Trail (km)	Raised Platform (# each)	Rock Armour (each)	Switch back (#)	Rock Outcrop (m)	other
Cumberland Trail	5.7(OK)	-	-	-	-	-	-
Landers Falls	-	5.6	-	-	8	-	
Lick Hole – Lobbs Hole Ravine Rd	-	5.4	54 (5)	2 (1)	4	40	
LHR Rd to Yarrangobilly Village	-	4.9	56 (9)	-	-	-	20m bridge
Village to Yans Crossing	-	6.6	111 (21)	4 (1)	4	-	-
Yans to Thermal Pool	-	7.6	91 (21)	10 (2)	2	-	20m bridge + 40m lead in
TOTAL	5.7km	30.1km	312m (56)	16m (4)	18	40m	40m bridge (2) 40m other platform

Project Elements – Talbingo and Yarrangobilly Precincts Combined

Area	Existing	Trail (km)	Raised Platform (# each)	Rock Armour (each)	Switch back (#)	Rock Outcrop (m)	Other (# each)
Talbingo Precinct	4km	51.2km	195m (43)	31m (18)	135	1100m	*
Yarrangobilly Precinct	5.7km	30.1km	312m (56)	16m	18	40m	*
Grand Total	9.7km	81.3km	507m (99)	57m	153	1140m	40m bridge(2)* 110m other platform (3)*
Rates	-	\$45pm	\$1000pm (\$400ea)	\$400pm	\$500ea	\$275pm	*varies per item
	\$20k	\$3.66M	\$507k (\$40k)	\$23k	\$78k	\$314k	\$1.05M
Project Trail Construction Total							\$5.77M

Project Elements – Cost Estimate Workup

Bridges

Thermal Pool - (TVT #4+5) \$260k construct + \$60k design - allow \$400k

\$6k hr big helicopter. Allow \$25k for flying materials

Yarrangobilly Village - bridge allow \$300k

Total for 2 x bridges = \$725k

Road Underpasses

Road Underpasses 2 x \$225K = \$450k

Other Platforms

110m x \$3000pm = \$330k

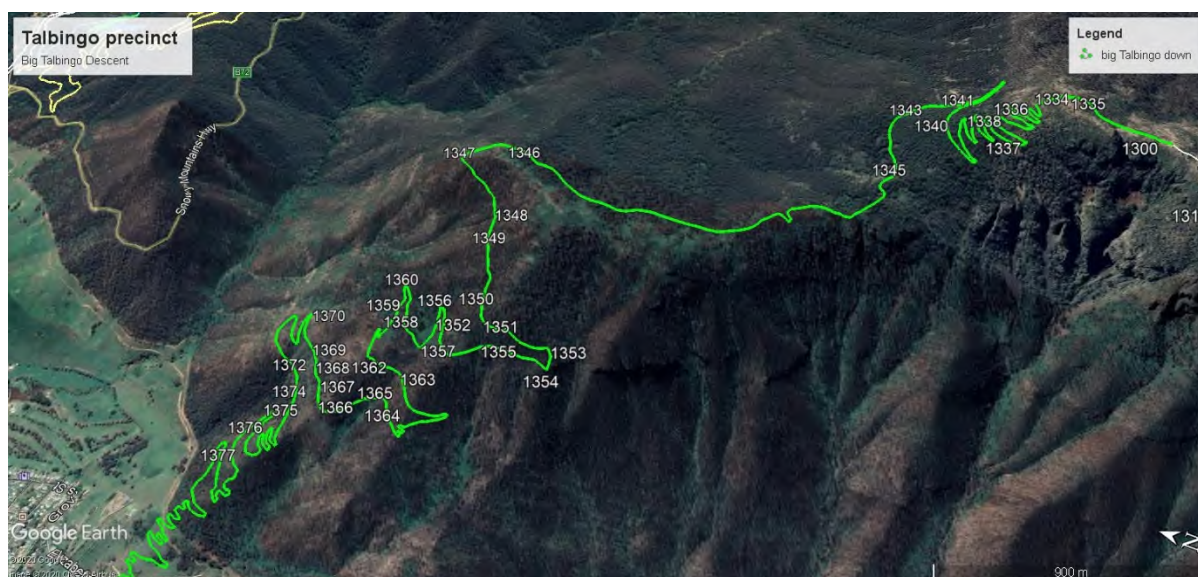
Helicopter

450kg deco bulker bag \$550 landed X 2m track coverage min = \$275pm

10 x bales @ \$15ea per load = \$150 x 10m per bale = \$1.50pm for reveg x 81km = \$122k

Trail Waypoints and Notes – Talbingo Precinct

Big Talbingo Mountain Descent



The alignment has been designed to descend the mountain, bypassing impassable rock cliffs and large rock features, while maximising views.

Higher up, the ground is mainly small to medium shaly rock with varying amounts of soil present, and so some areas may require the importation of fines material to help stabilise the track surface. Due to the presence of rock, most shallow water courses can be traversed with rock armouring only.

Waypoints	Category (side slope)	Distance (M)	Rock (size)	Comments
1300-1340	3	2,900	1-3	Heavily rocked
1340-1343	4	780	1-2	minimal soil
1343-1344	4	370	1-2	Minimal soil
1344-1347	3	2,200	1-2	
1347-1349	3-4	470	1-2	Scattered 5-6 rock
1349-1350	2-3	320	1-4	
1350-1354	3-4	455	1-4	Side slope (2) at switchback
1354-1357	3-4	825	1-4	Scattered rock
1357-1359	1-2	250	-	
1359-1362	3	630	2-4	
1362-1364	4-5	230	1-4	Scattered rock
1364-1367	3	1000	3-4	
1367-1370	3-4	395	1-3	Scattered rock
1370-1371	3	650	1-2	Scattered rock
1371-1372	3-4	50	1-3	
1372-1375	4-5	215	2-6	Heavily rocked
1375-1376	4	240	-	
1376-1377	3	380	2-4	
1377-end	2-3	3,050		
TOTAL		14,960m		
	Switchbacks	57		

Waypoint	Type	Condition (side slope)	Quantity	Comment
1300	Start	-	-	-
1344	Rock outcrop (RO)	(4)	10m	1-3 size rock
1345	Water course (WC)	Ok	1-2	
1346	RO	(3)	50m	3-4 size rock
1347	Lookout	-	-	Views of town
1349	Rock Armour (RA)	(2-3)	1m	Onsite rock
1355	Raised platform (RP)	(3-4)	4m	1 x handrail
1357	Wetland area	Ok	-	-
1358	-	Ok	5m	Overflow for wetland
1359	RA	(3)	1m	2-4 rock onsite
1361	RA	(3)	1m	3-4 rock onsite
1363	RA	(4-5)	1m	2-3 rock onsite
1365	RP	(3)	5m	
1367	RP	(4)	4m	1 x handrail
1369	RA	(3)	5m	1-4 rock onsite
1371	RA	(3)	2m	1-3 rock onsite
1372	RP	(4)	10m	2 x handrail
1373	RA	(4)	1m	1-4 rock onsite
1374	RP	(4)	5m	1 x handrail
1375	RP	(4)	20m	1 x handrail, 1-6 rock outcrop
1377	RO	(3)	20m	2-4 size rock
1378	-	-	6	Xanthorea plants
TOTAL	Rock Armour		12m	
	Rock outcrop		70m	
	Raised Platform		48m	
	Rock with min soil		650m	

Big Talbingo Mountain Climb

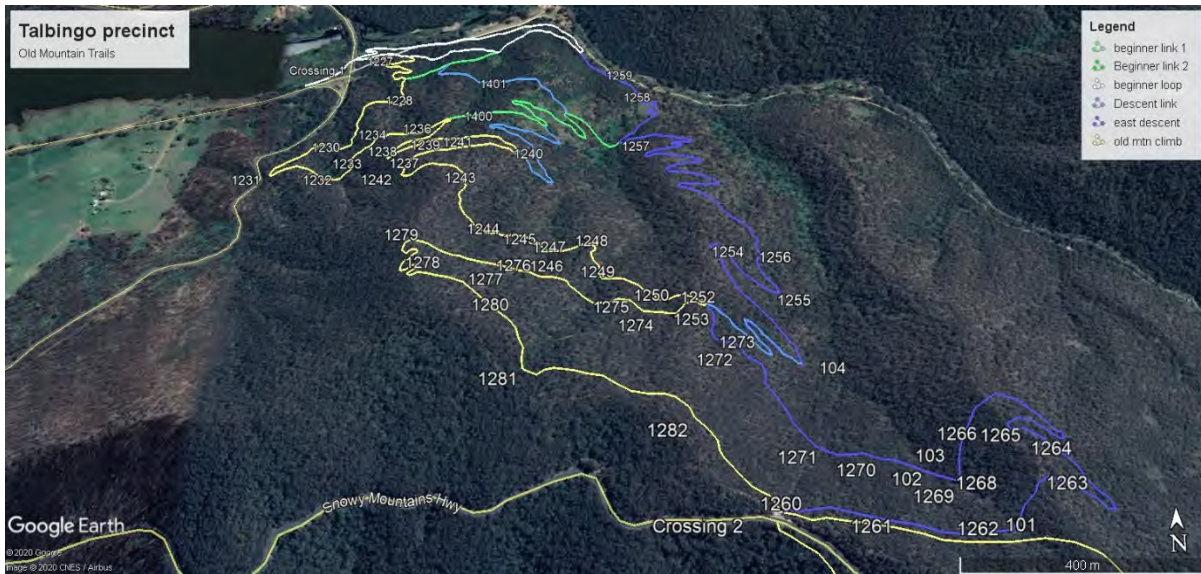


This section of trail is a combination of existing fire road and new alignments around longer steep sections of road, and to minimise conflict between bikes and vehicles accessing Landers Falls. Lower down the soil is good, becoming more rockier closer to peak.

Waypoint	Type	Condition (side slope)	Quantity	Comment
1323	Water course (WC)	Ok	-	
1324	Rock Armour (RA)	(3)	3m	2-5 size rock onsite
1325	-	Ok	50+	Large tree ferns below here
1330	Raised Platform (RP)	New	8m	
1331	Rock outcrop (RO)	(2-3)	70m	Size 1-4 rock
1304	WC	Ok	8m	May RA (rock @ 1306)
1305	WC	Ok	2m	May RA (rock @ 1306)
1306	RO	(3-4)	50m	3-5 size rock
1308	RO	-	40m	Large rock slab
1390	RP	(3)	6m	
1391	RP	(3)	4m	
TOTALS	Raised Platform		18m	
	Rock armour		3m	
	Rock Outcrop		160m	

Waypoints	Category (side slope)	Distance (M)	Rock (size)	Comments
Crossing 3 – 1287	3	1430	1-2	Scattered rock only
1287-1289	Existing	690	-	
1289-1323	2	630	-	
1323-1324	3	65	2-5	
1324-1326	2-3	515	1-2	Scattered rock
1326-1327	2	380	1-3	Small RO
1327-1331	3	820	-	
1331-1332	2-3	320	1-4	
1332-1319	Existing	1,770	-	
1319-1321	2-3	420	-	
1321-1292	Existing	665	-	
1292-1303	2-3	1,100	1-2	Scattered rock
1303-1304	2-3	65	3-4	
1304-1305	3	385	-	
1305-1306	3-4	60	3-5	
1306-1308	3	525	2-5	2 x RO
1308-1295	2-3	1,420	1-2	Scattered
1295-1296	Existing	200	-	
1296-1297	3	435	1-4	
1297-1298	Existing	375	-	
1298-1311	3	220	-	
1311-1313	3	500	1-4	Minimal soil
1313-1318	3	830	1-5	Scattered rock
1318-1300	Existing	220	-	
TOTAL	New	10,120m		
	Existing	3,920m		
	Switchbacks	18		

Old Mountain Trails



These trails are all new and form the basis of a smaller, contained series of loop trails close to Talbingo township. Trails at the base of hill are easiest, becoming gradually harder the higher you climb. At key points of the climb, an intersection gives you the option to keep climbing, or descend via linking trails then main descent back to bottom.

Several outcrops of Xanthorrhoea plants are scattered throughout the area and while care was taken to avoid where possible, a few sections of trail will have to traverse through some of these outcrops.

Climbing Trail (Yellow Alignment)

Waypoint	Type	Condition (side slope)	Quantity	Comment
1227	-	-	-	Valve for town water supply line
1228	Raised platform (RP)	(3)	3m	1 x handrail
1229	RP	(3)	5m	1 x handrail
1230	RP	(3)	4m	
1232	Rock Armour (RA)	(3)	3m	Size 1-4 rock onsite
1233	RA	(3)	3m	1-3 rock onsite
1234	-	Ok	12	Xanthorrhoea plant
1235	Intersection	(3-4)	-	right to climb, left to descend
1236	RA	(3-4)	1m	Onsite rock
1238	-	(3)	6	Xanthorrhoea plants
1239	RP	(3-4)	3m	
1240	Intersection		-	Right to climb, left to descend
1241	Rock outcrop (RO)	(3-4)	20m	2-4 size rock
1242	-	(4)	50+	Scattered Xanthorrhoea
1243	-	(3-4)	10	Xanthorrhoea
1244	RP	(3-4)	4m	2 x handrail
1245	RA	(3-4)	2m	Rock onsite
1246	RP	(3-4)	2m	

Waypoint	Type	Condition (side slope)	Quantity	Comment
1247	RA	(3-4)	1m	Rock onsite
1249	RP	(4)	3m	1 x handrail, scattered Xanthorrhoea
1250	RA	(4)	1m	Rock onsite
1251	RP	(3)	3m	
1252	Intersection	-	-	Right to climb, left to descend
1253	RP	(3)	2m	
1274	RP	(3)	2m	
1275	RP	(3-4)	3m	1 x handrail
1276	RP	(3-4)	3m	1 x handrail
1277	RA	(3-4)	1m	Rock onsite
1278	RA	(4)	1m	Rock onsite
1279	RO	(4)	100m	2-4 size rock
1280	Intersection	-	-	With old mountain road
1281	RA	(3)	1m	Rock onsite
1282	RO	(4)	50m	2-4 size rock
TOTALS	Raised Platform		37m	
	Handrail		25m	
	Rock armour		14m	
	Rock Outcrop		170m	

Waypoints	Category (side slope)	Distance (M)	Rock (size)	Comments
1227-1235	3	1425	1-2	Scattered rock only
1235-1242	3-4	1090	2-4	Scattered rock
1242-1243	4	210	-	
1243-1249	3-4	575	2-3	Scattered rock
1249-1251	4	215	2-3	
1251-1253	3	140	-	
1253-1274	4	60	-	
1274-1275	3	105		
1275-1278	3-4	340	1-3	Scattered rock
1278-1279	4-5	90	1-3	
1279-1282	3	955	1-2	
1282-crossing 2	4	220	2-4	
TOTAL	New	5,415m		
	Switchbacks	19		

Descending Trail (Dark Blue Alignment)

Waypoint	Type	Condition (side slope)	Quantity	Comment
1260	Raised platform (RP)	(3-4)	2m	1 x handrail
1262	RP	(4)	2m	1 x handrail
1263	-	(3)	-	Old road / powerline
1265	-	(3)	-	Old road / powerline
1266	Rock outcrop (RO)	(3-4)	50m	3-5 size rock
1267	Water course (WC)	(3-4)		Ok with machine clean up
1268	RP	(3-4)	5m	1 x handrail
1269	RP	(3-4)	2m	Scattered Xanthorrhoea x 10
1270	RP	(3-4)	2m	1 x handrail
1271	RP	(3-4)	6m	1 x handrail
1272	RP	(3-4)	6m	2 x handrail
1273	RP	(4)	6m	1 x handrail
1254	-	(3)	-	Old mountain road crossing
1256	-	(3-4)	-	Od mountain road crossing
1257	RP	(3)	4m	
1258	RP	(2-3)	3m	
TOTALS	Raised Platform		38m	
	Handrail		35m	
	Rock Outcrop		50m	

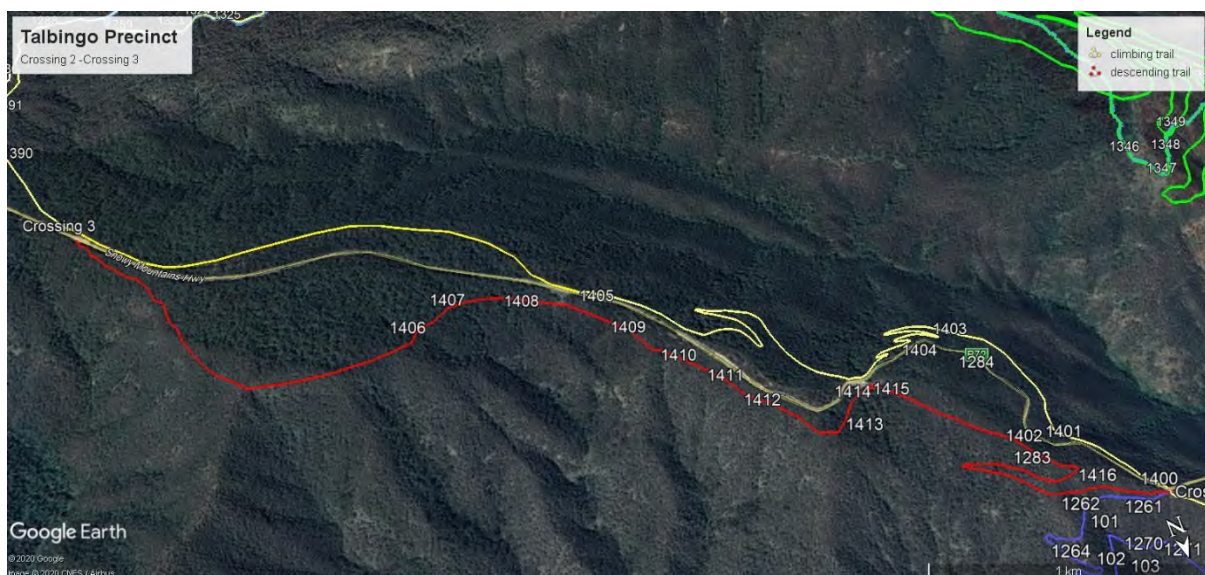
Waypoints	Category (side slope)	Distance (M)	Rock (size)	Comments
1260-1263	3-4	480	2-3	Scattered Xanthorrhoea
1263-1266	3	750		
1266-1273	3-4	770	1-5	Scattered Xanthorrhoea
1273-1258	3	2,690	1-2	Scattered Xanthorrhoea
1258-end	2-3	250		
TOTAL	New	4,940m		
	Switchbacks	21		

Beginner and Link Trails

Waypoint	Type	Condition (side slope)	Quantity	Comment
1400	Raised platform (RP)	2-3	3m	
1401	RP	2	3m	
TOTALS	Raised Platform		6m	

Waypoints	Category (side slope)	Distance (M)	Rock (size)	Comments
Beginner loop (white)	2	1675	-	
Link 1 (green)	2-3	265	-	
Link 2 (light blue)	2-3	495	-	
Link 3 (green)	3	940		
Link 4 (light blue)	3	665	-	
TOTAL	New	4,040m		
	Switchbacks	10		

Section 2 – Crossing 2 to 3



This section of trail is new trail, with a section of old road alignment used in one area. The climbing side of crossing 2 requires a large platform with stopping area, as well as a gap in guard rail for safe crossing. Another large platform on climb allows traversing of large boulders and provides a lookout to Mill Creek area.

Several large populations of Xanthorrhoea plants were noticed on mid to lower slopes down to Jounama Creek on descending side of highway. Alignment was chosen to keep trail wherever possible above these populations.

Climbing Trail (Yellow Alignment)

Waypoint	Type	Condition (side slope)	Quantity	Comment
1400	Raised platform (RP)	3-4	30m	1 x handrail + 2mx2m pad
1401	RP	4	40m	1 x handrail + view platform
1402	RP	3-4	4m	1 x handrail
1403	RP	3-4	4m	1 x handrail
1404	Water course (WC)	Ok	4m	
1405	Intersection	Ok	-	Connection to Black Perry lookout

Waypoint	Type	Condition (side slope)	Quantity	Comment
TOTALS	Raised Platform		8m	
	View platform		70m	+2 x 4m2 pads

Waypoints	Category (side slope)	Distance (M)	Rock (size)	Comments
1400-1401	3-4	380	1-2	On road embankment
1401-1402	3-4	60	1-5	
1402-1403	3	590	1-2	
1403-1404	3-4	860	1-2	Scattered rock
1404-1285	3	430	1-2	Scattered rock
1285-1405	3-4	1,920	1-2	Scattered rock
1405-crossing 3	2	2,320	-	Old highway corridor
TOTAL	New	5,560m		
	Switchbacks	8		

Descending Trail (Red Alignment)

Waypoint	Type	Condition (side slope)	Quantity	Comment
1406	Raised platform (RP)	3	5m	
1407	RP	3	4m	
1408	RP	3-4	4m	1 x handrail
1409	RP	3-4	3m	1 x handrail
1410	RP	4	5m	1 x handrail
1411	Rock armour (RA)	4	1m	Rock onsite
1412	RA	4	1m	Rock onsite
1413	RP	3	4m	1 x handrail
1414	RP	3	5m	1 x handrail
1415	Intersection	3-4	-	Palace saddle and old road
1416	-	3-4	-	End old road section
TOTALS	Raised Platform		30m	
	Rock armour		2m	

Waypoints	Category (side slope)	Distance (M)	Rock (size)	Comments
Crossing 3 – 1406	3	1,880	1-2	Scattered rock
1406-1408	3-4	455	1-2	Scattered rock
1408-1410	3-4	680	1-3	
1410-1412	4	405	1-2	Scattered rock

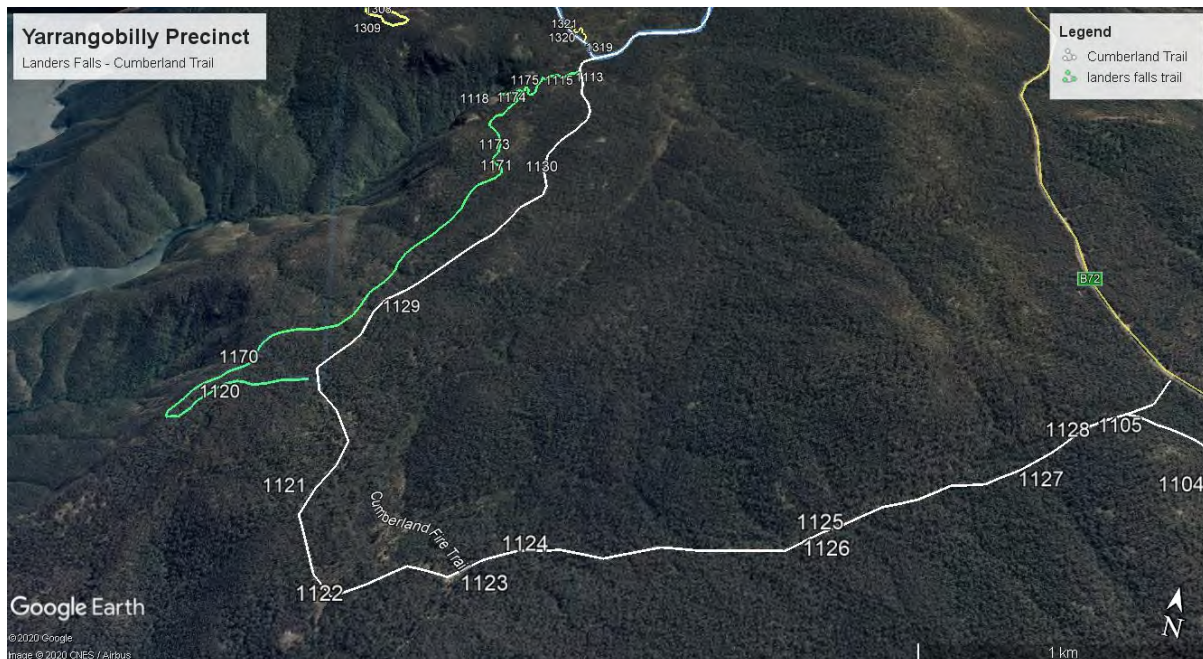
Waypoints	Category (side slope)	Distance (M)	Rock (size)	Comments
1412-1415	3-4	655	1-2	Scattered rock
1415-1416	2	810	-	Old road alignment
1416-1400	3-4	1,265	-	Old highway corridor
TOTAL	New	6,105m		
	Switchbacks	2		

Talbingo Precinct Totals

Area	Existing (ok)	Trail (km)	Raised Platform (# each)	Rock Armour (each)	Switch back (#)	Rock Outcrop (m)	other
Big Talbingo Descent	-	15	48 (6)	12 (7)	57	720	
Big Talbingo Climb	4 (OK)	10.1	18 (4)	3 (1)	18	160	
Old mountain climb	-	5.4	47 (12)	14 (9)	19	170	
Old mountain descent	-	4.9	38 (10)	-	21	50	
Old mountain links	-	4.1	6 (2)	-	10	-	
Crossing 2-3 climb	-	5.6	8 (4)	-	8	-	70m view platform
Crossing 2-3 descent	-	6.1	30 (7)	2 (1)	2	-	
TOTAL	(4km)	51.2km	195m (43)	31m (18)	135	1100m	70m*

Trail Waypoints and Notes – Yarangobilly Precinct

Cumberland Fire Trail to Lick Hole Fire Trail (via Landers Falls)

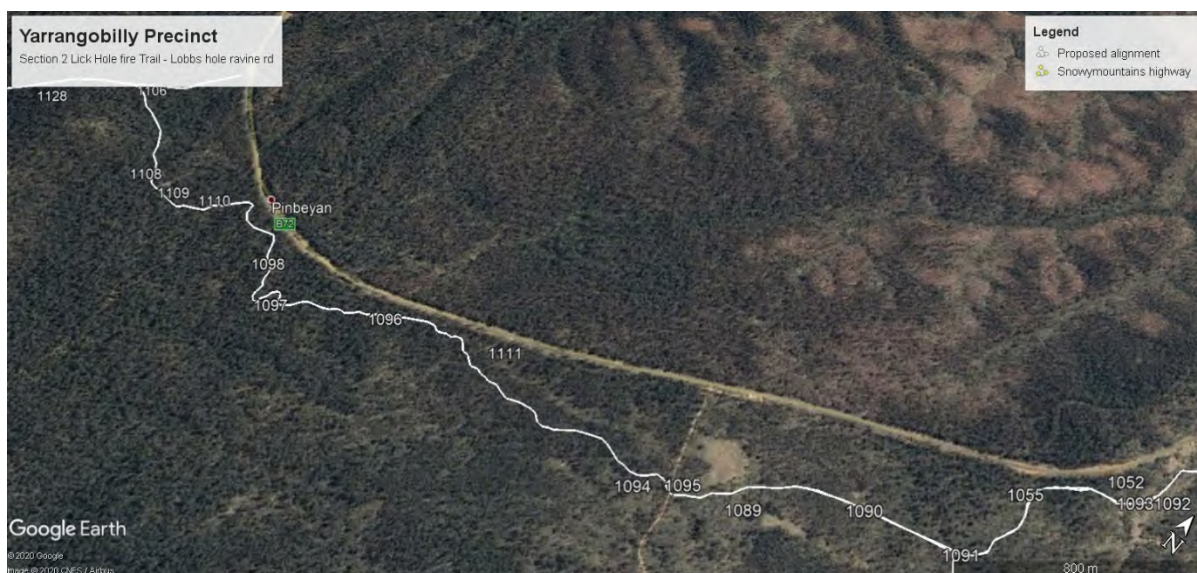


The existing fire trail sections of Cumberland and Lick Hole Trails are generally in good condition, requiring only the armouring of a few existing water crossings. The new section at Landers falls is designed to create a two way loop trail, rather than the existing in/out trail, which is steep and not suitable for most part as a mountain bike trail, and to provide Talbingo Dam views.

Waypoint	Type	Condition	Quantity	Comment
1114	Existing platform	OK	3m	Ok from start of trail to here. New alignment form platform to lookouts
1175	Lookout	Ok	-	Existing lower lookout
1118	Lookout	Ok	-	Existing upper lookout
1174	Intersection	-	-	Connection between new trails
1173-1174	2-3 slope	New	700m	2-3 size rock
1172	Wet	Ok	6m	Possible rock crossing
1171-1173	2-3 slope	New	307m	1-2 size rock
1170-1171	2-3 slope	New	2,100m	1-2 size rock 2 x switchbacks
1171-1120	3 slope	New	885m	2-4 size rock
1120-end	1-2	New	495m	
1130	Existing	Fair	-	Steep section of existing fire trail
1121	Existing	Ok	-	Steeper section of fire trail
1129	Wet	Fair	-	Ok but needs drainage work, water leeching onto trail
1122	Wet	Fair	4m	*Needs 3t shot rock to armour only
1123	Existing	Ok	-	Intersection with lick hole trail, 15m wet section but ok
1124	Water crossing	Ok	2m	Possible rock armour with onsite rock

Waypoint	Type	Condition	Quantity	Comment
1125	Water crossing	Ok	3m	Existing
1126	Water crossing	Ok	1m	Existing
1127	Water crossing	Fair	7m	*Deep, requires 3t shot rock to armour
1128	Other	-	-	Fallen tree on track
1106	Intersection	-	-	Start of new section to lobbs hole ravine rd
TOTAL	Landers Falls	New	5,720m	
	Fire Trail	Existing	11,665m	

Lick Hole / Lobbs Hole Ravine Rd



Waypoint	Type	Condition	Quantity	Comment
1106	-	-	-	Intersection with Lick Hole Fire Trail
1108	Water crossing	Fair	2 x 5m	Old existing crossings that require some repair work
1109	-	-	-	-
1110	Raised Platform (RP)	New	12m	
1098	Rock outcrop	-	50m	Size 2-3 rock
1097	Rock outcrop	-	45m	Size 2-3 rock
1096	Other	-	-	Possible log feature
1111	Other	-	-	Road access
1094	Other	-	-	Jounama School site
1095	-	-	-	Intersection -Lobbs Hole Ravine Rd
1089	RP	New	30m	Wetland outlet
1090	-	-	-	-
1091	-	-	-	-
1055	RP	New	3m	
1052	RP	New	5m	

Waypoint	Type	Condition	Quantity	Comment
1093	RP	New	4m	
1092	Rock armour	New	2m	Rock on site
TOTALS	Raised Platform		54m	
	Rock armour		2m	
	Rock Outcrop		95m	

Waypoints	Category (side slope)	Distance (M)	Rock (size)	Comments
1106-1095	2	3500m	-	
1095-1090	1	670m	-	Around wetland
1090-1091	2	330m	-	
1091-1092	1	850m	-	
TOTAL		5,350m		

Lobbs hole Ravine Rd to Yarrangobilly Village



This section is a combination of old highway alignment and new trail. The old road has some major drainage issues which need to be repaired, and the corridor reduced to create a defined trail alignment. The new trail has two proposed alignments, the first is more scenic and away from road but requires several platforms. The alignment closer to road is less scenic and has some flat areas, but requires less platforms. A bridge has been included over river at village to provide a key access point for trail.

Waypoint	Type	Condition	Quantity	Comment
1070	Raised platform (RP)	New	2m	
1069	Other	-	-	Powerline access trail
1067	RP	New	3m	
1066	Other	-	-	4 x switchbacks
1065	Water crossing	Ok	4m	May require armouring
1064	RP	New	9m	
1063	RP	New	8m	
1061	RP	New	5m	
1062	Other	-	-	Yarrangobilly cemetery
1078	Drainage	Poor	100m	Deep water course, requires repair / installation of drainage
1080	Other	-	-	Intersection of old road and drive to hut ruins
1081	Other	-	-	Brick hut ruins
1082	RP	New	3m	
1083	Other	-	-	Intersection of trail for village bridge or river trail
1076	Bridge	New	20m	Bridge span over river 2 x handrails
1085	RP	New	3m	
1086	-	-	-	Steeper side slope
1087	RP	New	8m	
1088	RP	New	5m	

Waypoint	Type	Condition	Quantity	Comment
Option B				
1071	Road culvert	Ok		Flat terrain along road verge
1072	Road culvert	Ok		15m wide road verge
1073	RP	New	4m	Along road verge
1074	RP	New	6m	
TOTALS	Raised Platform		56m	
	Bridge		20m	

Waypoints	Category (side slope)	Distance (M)	Rock (size)	Comments
1070-1069	2	910m	-	
1069-1062	2-3	1900m	-	
1062-1080	2	880m	-	Old road alignment
1080-1081	1	200m	-	Old road alignment
1081-1083	3	185m	-	
1083-1086	2	305m	-	
1086-1088	3	480m	1-2	
TOTAL		4,860m		

Yarrangobilly Village to Yans Crossing



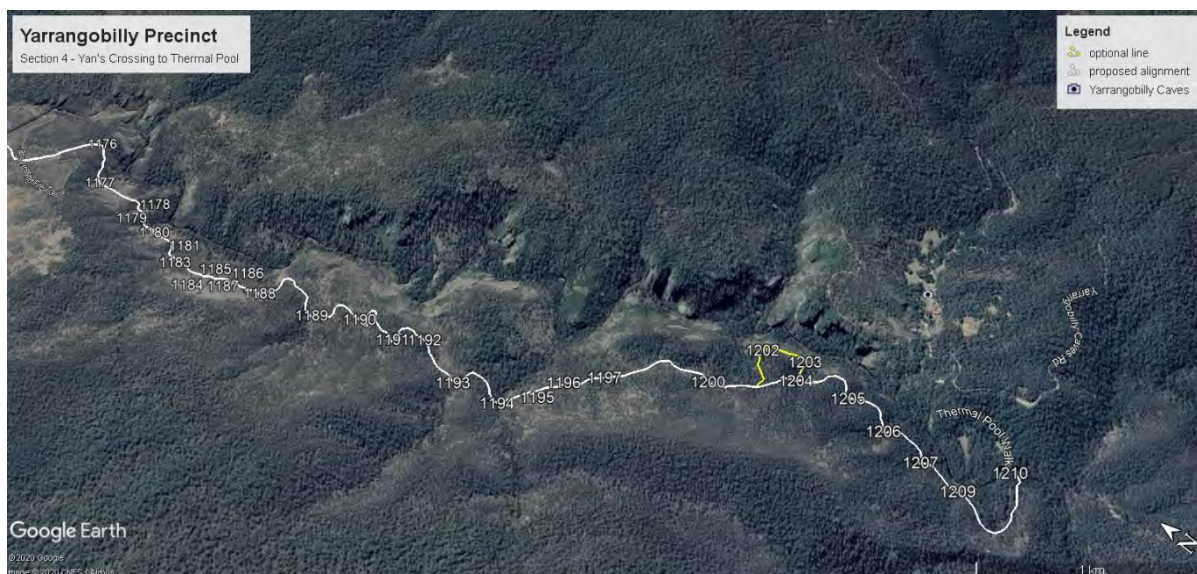
This upper section of the Yarrangobilly River follows a reasonably deep valley with some short sections of river flat or steep rock outcrops. The valley traverses numerous natural gullies and watercourses, many of which require a raised platform. In steeper areas, a handrail would also be required on river side of platform. A longer platform is required in one section where trail alignment is not possible over a rock outcrop.

Waypoint	Type	Condition	Quantity	Comment
1168	Raised platform (RP)	New	3m	
1167	RP	New	3m	
1067	RP	New	50m	1 x handrail. Across rock outcrop
1166	Other	-	-	Steep area
1165	RP	New	5m	1 x handrail
1164	Water crossing	Ok	-	
1162	RP	New	5m	
1160	RP	New	6m	2 x handrail
1159	Water crossing	Ok	2m	
1158	RP	New	2m	
1157	RP	New	5m	1 x handrail
1156	RP	New	2m	
1154	RP	New	2m	
1153	RP	New	2m	
1152	RP	New	4m	2 x 2m platforms here
1150	RP	New	5m	2 x switchbacks above
1147	Other	-	-	Steeper side slope
1145	RP	New	2m	
1143	RP	New	4m	
1142	RP	New	2m	
1141	RP	New	4m	2 x handrail
1140	RP	New	2m	

Waypoint	Type	Condition	Quantity	Comment
1139	Water crossing	-	1m	Rock armour (on site rock)
1138	RP	New	2m	
1137	RP	New	4m	1 x handrail
1135	Water crossing	Ok	2m	Rock armour
1134	Water crossing	Ok	2m	2 x small crossings, rock armour (on site)
1133	RP	New	4m	
1132	Water crossing	Ok	-	
TOTALS	Raised Platform		111m	
	Handrail		84m	

Waypoints	Category (side slope)	Distance (M)	Rock (size)	Comments
1169-1167	3	545m	-	
1167-1164	4-5	630m	-	
1164-1163	3	180m	1-2	
1163-1159	2	675m	-	Near river flats
1159-1153	3	445m	1	
1153-1150	2	990m	-	
1150-1145	4-5	700m	2-4	
1145-1142	2-3	430m	-	
1142-1140	3-4	825m	-	
1140-1138	3	80m	-	
1138-1137	4	115m	2-4	
1137-1131	3	950m	1-2	
TOTAL		6,565m		

Yans Crossing to Thermal Pool



This lower section of the Yarrangobilly river follows a steep valley, with numerous side valleys that need to be traversed. As such, much of the trail is located high above river and offers vistas of the caves area along the way. It finishes with a bridge over the river, finishing at the thermal pools.

Waypoint	Type	Condition	Quantity	Comment
1177	Raised platform (RP)	New	8m	1 x handrail
1178	RP	New	3m	1 x handrail
1179	Water crossing	Ok	3m	Steep exit through shale
1180	Water crossing	Ok	8m	Possible rock armour (on site rock)
1181	RP	New	8m	1 x handrail
1182	RP	New	4m	1 x handrail
1183	Water crossing	Fair	2m	Rock armour (on site)
1184	RP	New	3m	1 x handrail
1185	RP	New	4m	1 x handrail
1186	RP	New	3m	
1187	RP	New	3m	1 x handrail
1188	RP	New	6m	1 x handrail
1189	RP	New	6m	2 x handrail
1190	RP	New	4m	Flattish creek bed
1191	Other	-	-	4 x switchbacks
1192	Other	-	-	Saddle of hill
1193	RP	New	3m	
1194	RP	New	5m	
1195	RP	New	4m	
1196	RP	New	4m	1 x handrail
1197	RP	New	3m	
1200	RP	New	4m	

Waypoint	Type	Condition	Quantity	Comment
1205	RP	New	2m	
1206	RP	New	2m	
1207	RP	New	2m	1 x handrail
1209	RP	New	2m	
1210	Bridge	New	20m	Plus 40m platform lead ins
Option B				
1203	RP	New	40m	1 x handrail – possible lookout platform
1204	RP	New	5m	
TOTALS	Raised Platform	-	91m	Plus 40m for bridge lead ins
	Handrail		57m	
	Rock armour		10m	
	Bridge		20m	

Waypoints	Category (side slope)	Distance (M)	Rock (size)	Comments
1176-1178	3-4	630m	1-2	Scattered rock
1178-1179	3	175m	1-5	Good soil
1179-1180	4	95m	1-3	
1180-1188	3	850m	1-3	Scattered
1188-1190	2-3	900m	1-4	Scattered
1190-1193	3	985m	-	
1193-1194	1-4	350m	-	
1194-1200	3	1150m	3-5	20m section of rock only
1200-1205	3	875m	-	
1205-1209	3-4	905m	-	
1209-1210	2	650m	-	
TOTAL		7,565m		
Optional line	4-5	775m	1-5	Steep with exposure to river but cave views

Yarrangobilly Precinct Totals

Area	Existing (ok)	Trail (km)	Raised Platform (# each)	Rock Armour (each)	Switch back (#)	Rock Outcrop (m)	Other (each)
Cumberland Trail	5.7(OK)	-	-	-	-	-	-
Landers falls	-	5.6	-	-	8	-	
Lick Hole – Lobbs Hole Ravine Rd	-	5.4	54 (5)	2 (1)	4	40	
LHR Rd to Yarrangobilly Village	-	4.9	56 (9)	-	-	-	20m bridge
Village to Yans Crossing	-	6.6	111 (21)	4 (1)	4	-	-
Yans to Thermal Pool	-	7.6	91 (21)	10 (2)	2	-	20m bridge + 40m lead in
TOTAL	5.7km	30.1km	312m (56)	16m (4)	18	40m	40m bridge (2) 40m other platform

General Construction Considerations

The trail network has been designed to deliver the following:

- An interconnected network that works with the natural landscape
- Riding experiences for all ages and levels of riding ability
- Alignments that showcase the natural and historical features of the region
- Shuttle options for riders who choose not to use the climbing trails
- 'Rest and Recharge' areas where riders can stop and rest, potential to include solar powered charging stations at these locations.

Trail Design Standards

The trail networks will be designed in accordance with the requirements of the Australian Mountain Bike Trail Guidelines (MTBA 2019).

Safety Considerations

The following safety issues have been considered during the design of the trail network:

- Trails located adjacent to roads – where possible physical barriers will be used to provide separation between riders and vehicles
- Road crossing points – crossing points have been located in slower speed zones within township areas and on straight sections of road to provide good sight lines where the trails cross the Snowy Mountains Highway. Signage and lighting will also be used at crossing points to make drivers and riders aware of the safety issues.
- Traffic at trail heads – trail heads have been located where there is adequate existing carparking spaces or in areas where there is enough space to construct carparking spaces. In addition to car parking, adequate clear areas will be established around trail head facilities to allow riders to congregate in the area without obstructing the use of the trails.
- Emergency points – emergency location beacons will be installed throughout the trail network to allow riders to convey their location to emergency services.
- Emergency services access – emergency services and NPWS will be consulted to identify access locations for emergency services to reach injured or unwell riders. This may include the establishment of helicopter landing sites throughout the trail network.

A risk register will be developed as part of the master plan to capture all identified risks and the control measures that will be implemented to eliminate or mitigate the risks.

Trail Heads and Parking

Trail heads will be established to provide focal points at strategic locations throughout the trail network.

Trail heads are important as they allow information to be shared with riders about what to expect on the trail network as well as notifying riders of any hazards or trail changes that have occurred.

Trail heads will be located at the following locations:

- Talbingo, townships
- Yarrangobilly Caves House
- Shuttle Point on the Snowy Mountains Highway

The trail heads will include the following facilities:

- Trail maps and information signs
- Carparking areas
- Shuttle pick up / drop off areas
- Charging stations for eMTB's
- Road signage for drivers
- Picnic tables with shelters
- Bike racks and bike repair stands
- Toilets (new at shuttle point)
- Water points (township locations only)
- Bike washing facilities (township locations only).

Road Crossings

Road crossings will be required at several locations throughout the trail network. The main crossings will be on the Snowy Valley Highway at the base of the Old Mountain Climb, at the midway point of the Old Mountain Climb, and at the shuttle point at the top of the Old Mountain Climb / start of the linking trail to Big Talbingo Mountain.

Where possible crossings will be located in lower speed zone areas and where both drivers and riders have good lines of sight.

Crossing hazard signage and lighting will be installed at all road crossings.

The Roads and Maritime Service will be consulted during the development of the master plan to determine optimum crossing locations and to determine if speed limits need to be reduced at these locations, or if they require additional crossing measures.

Rest and recharge stations

A key element of the trail network will be rest and recharge stations that will allow riders to take a break, enjoy the surroundings and where required, charge their eMTB's.

Rest and recharge stations will be located at sites with natural features (lookouts, waterfalls, etc.) and at sites with cultural or historic significance.

Signage

Signs will be used throughout the trail network to provide direction, manage behaviour, inform users of hazards and to expedite emergency service response.

Trail signs will be designed to be consistent with relevant RMA, NPWS and SVC requirements.

Trail bridges and platforms

Trail bridges and platforms will be used to cross waterways, steep gullies and to elevate the trail above environmentally sensitive areas.

Trail bridges and platforms will be constructed using steel frames and steel decking. Rock armouring of entry / exit points of bridges / platforms will be used where required.

Handrails will be installed on one or both sides where the bridge or platform exposes the rider to significant exposure and risk of falling.

Trail furniture

Trail furniture includes seats, shelters, bike racks, and other structures that will enhance the end user experience of the trail network.

Where possible, trail furniture will be constructed using steel and other non-combustible materials.

Trail furniture will be designed to be consistent with relevant RMA, NPWS and SVC requirements.

Appendix F: Talbingo and Yarrangobilly MTB Project Review of Environmental Factors (REF)

Review of Environmental Factors

Talbingo and Yarrangobilly Mountain Bike Trail Network



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1 Brief description of the proposed activity

Description of proposed activity	<p>Talbingo and Yarrangobilly are located within a region with high tourist visitation near and in Kosciuszko National Park (KNP). Jindabyne to the south and Canberra to the east are both recognised as mountain bike tourism destinations.</p> <p>The Concept Plan has identified that there is a significant opportunity to develop the area surrounding Talbingo into a mountain bike tourism destination with the development and installation of a mountain bike trail network, thereby providing additional new business opportunities and increasing the economic benefits to existing businesses.</p> <p>Additionally, the recent evolution of electric mountain bikes (eMTB's) has opened opportunities to develop longer and more challenging trail networks that, while still suitable for normal mountain bikes, will be more accessible and provide a unique user experience for eMTB riders.</p> <p>Further detail is provided in Section 6.2 of this document.</p>
Name of NPWS park or reserve	Kosciuszko National Park
Location of activity (e.g. precinct name or nearby street)	Talbingo, Yarrangobilly, Pinbeyan, Bogong Peak Wilderness

Estimated commencement date	April 2021
Estimated completion date	April 2024

2 Proponent's details

This document has been prepared by High Country Environmental as part of the project team led by Natural Trails on behalf of the proponent Snowy Valleys Council.

Organisation	Snowy Valleys Council
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3 Permissibility

3.1 Legal permissibility

The following matters have been considered to assess the permissibility of the proposed activity under the *National Parks and Wildlife Act 1974 (NPW Act)*.

National Parks and Wildlife Act 1974 (NPW Act)

Justification (consider the following matters):

Objects of the Act (s.2A)

The proposed development and installation of the proposed MTB network would be done in such a way to minimise the impact to nature and objects, places, and features of cultural value but will enable public appreciation of the surrounding nature and cultural significance and will apply ecologically sustainable development, maintenance, and management principles.

Reserve management principles (s.30E–30K)

The development and installation of the proposed MTB network would be done in such a way to minimise the impact to nature, historic and aboriginal areas of cultural significance, or geoheritage locations but will enable members of the public to access areas of KNP that are not, currently, readily accessible providing greater opportunity for public appreciation and enjoyment of these areas of significance.

Title and relevant sections of plan of management or statement of management intent

The Kosciuszko National Park Plan of Management 2006 which incorporates the Snowy Management Plan and details the overarching principles of the management of the park with the need for an environmentally sensitive and sustainable approach to maintaining the natural and cultural values.

The proposed MTB network is consistent with the recreational values and environmental stewardship and more specifically Section 8.11 of the plan of management and the *Kosciuszko National Park Plan of Management: To allow consideration of sustainable mountain biking opportunities* amendments that were released in 2014.

- “Developing clusters of linked short-duration recreational opportunities at sites along key roads at popular destinations”;
- “The provision of opportunities for public understanding, enjoyment and appreciation of natural and cultural heritage values, including opportunities for sustainable visitor use;
- “Benefits to local communities”;
- “Environmental management systems are in place for all operations and activities conducted within the park”; and
- “The extent to which visitors, park neighbours, members of local communities and the general public take personal responsibility for protecting the values of the park is improved”.

Leasing, licensing and easement provisions of Part 12

The proposed MTB network is pursuant with the Part 12 Section 151A of the NPW. The network will not include the modification of any existing buildings or structures but will require the erection or installation of minor structures including:

- Signage;
- picnic tables and chairs;
- small shelters;
- trail racks;
- solar charging stations;
- drop toilets;
- water points;
- unsealed carparks; and
- possibly 2 underpasses.

Special note:

For lease proposals under s.151 NPW Act involving new buildings or structures, section 151A(5) of the NPW Act states that the Minister must not grant a lease under s.151 for visitor or tourist uses that authorises the erection of a new building or structure unless the plan of management identifies the purpose as permissible and the general location for the new building.

If relevant to the proposal, indicate whether this requirement has been met, or will be.

The general location of all installations is provided in Figure 1.

The following matters have been considered to assess the permissibility of the proposed activity under the *Wilderness Act 1987*.

Wilderness Act 1987 (for activities in wilderness areas)

Justification (consider the following matters):

Objects of the Act (s.3)

N/A The proposal is not located in and will not impact any declared wilderness areas.

Wilderness management principles (s.9)

N/A The proposal is not located in and will not impact any declared wilderness areas.

Restrictions on leasing, licensing and easement (see s.153A NPW Act)

N/A The proposal is not located in and will not impact any declared wilderness areas.

Environmental Planning and Assessment Act 1979 (EP&A Act)

Consider aims and objectives of relevant environmental planning instruments, zoning and permissible uses, development controls, etc.

Explanatory note: Clause 65 of State Environmental Planning Policy (Infrastructure) 2007 provides that development for any purpose may be undertaken within lands **reserved** under the NPW Act without consent. This removes the need for development consent under Part 4 of the EP&A Act (e.g. council approval), meaning that most activities within OEH land are assessed under Part 5. However, proponents should still confirm that the Infrastructure State Environmental Planning Policy (SEPP) is applicable to their particular proposal, and provide consideration of other environmental planning instruments that would otherwise apply to the proposal if it were not occurring on OEH land.

If the lands are **not reserved** under the NPW Act (i.e. are lands vested in the Minister under Part 11), the zoning provisions under the relevant local environmental plan will need to be checked.

Justification (indicate any or all of the following that are relevant):

- The activity may be undertaken without development consent as it is
- on reserved land** and is:
 - for a purpose authorised under the NPW Act (cl.65 Infrastructure SEPP)
 - The activity is **not on reserved land** but may be undertaken without development consent because:
 - it is zoned E1 under the [insert name of relevant local environmental plan] **or**
 - the zoning of the land does not require development consent for the activity.

[Identify and briefly outline the alternative zoning of the land under the relevant local environmental plan.]

[Include any other relevant comments or information related to zoning (and the relevant land use table regarding development without consent) or application of the Infrastructure SEPP.]

Determination of the MTB trail network is required pursuant to Part 5, Division 5.1 of the EP&A Act as the works are and “activity” as defined under Section 5.1(1) of the EP&A Act and activities of a recreational purpose are a use authorised under the Part 12 of the NPW Act with the consent of the Park Authority, pursuant of clause 23 of the NPW Act.

- The activity is on land that contains coastal wetlands, littoral rainforest or koala habitat and the relevant aims, objectives, principles and provisions of the relevant SEPPs (namely SEPP 14, SEPP 26 or SEPP 44) have been considered in preparation of the REF.
- Explanatory note:** these SEPPs do not apply to land reserved under the NPW Act. However, it is OEH policy that the **objectives** and **principles** of these SEPPs are applied to the assessment of on-park activities.

[Include relevant comments or information to demonstrate consideration of the relevant SEPP.]

The land for the proposed MTB network does not include coastal wetlands, or littoral rainforest. The Snowy Valleys LGS is listed in Schedule 1 of SEPP44 so must be considered.

- Based on a recent survey performed for the Snowy 2.0 Environmental Impact Assessment, no Koala's or scats were found in the area.
- The proposed development and installation of the proposed MTB network would be done in such a way to minimise the impact to nature, flora, and fauna.
- Only bushes and saplings will be removed during the installation, no living established trees will be felled. If large established trees that have been damaged in the recent bushfires pose a safety risk, they will be felled in a safe manner in consultation with NPWS.

Heritage Act 1977 (for activities likely to affect items or places listed on the State Heritage Register or of historic cultural heritage value)

Justification (indicate any or all of the following that are relevant):

The activity is on land that contains:

- an item listed on the State Heritage Register (SHR)
- an item not listed on the SHR but identified by OEH as being of state significance
- an item listed on the OEH Heritage and Conservation Register (contained in the Historic Heritage Information Management System)
- a place, building landscape feature or moveable heritage item older than 25 years

NB: Activities likely to affect the above may require expert advice and assessment, such as preparation of a heritage impact statement.

[Include relevant comments or information related heritage items or places, and any supporting assessment.]

There is no potential to impact on heritage listed items or places listed, see **Section 8** for more detail).

Biodiversity Conservation Act 2016

Justification:

Is the activity consistent with the biodiversity conservation objectives of the Act?

The proposed development and installation of the proposed MTB network would be done in such a way to minimise the impact to nature, flora, and fauna so it is unlikely that threatened species, populations, and ecological communities would be impacted but the MTB network. See **Section 8** for more detail.

Rural Fires Act 1997

Justification:

Is the activity consistent with the objectives of protecting life and property and protection of the environment? Is it consistent with bush fire management plans?

The proposed MTB network falls under the Snowy Valleys Bush Fire Management Committee Bush Fire Risk Management Plan.

Pursuant of the requirements, the contractor installing the MTB network will take steps to prevent the occurrence of spread of a fire during construction and signs will be erected on completion to notify the users of the MTB network of the dangers of bushfires and measure to mitigate potential fires.

Should a fire occur during construction the contractors installing the MTB will take all possible steps to extinguish the fire where safe to do so, and if required, will inform emergency services.

Emergency procedure to follow and numbers (000) to call will be included on trail signage for users in the event of fires.

Fisheries Management Act 1994

Justification:

Will the activity affect fish, fish habitat or marine vegetation, including threatened species? Is approval required under the Act?

The proposed development and installation of the proposed MTB network will require a small number of water crossings but these will be designed, installed, and remain in perpetuity to minimise the impact to fish and aquatic life.

Commonwealth legislation (including the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* and the *Telecommunications Act 1997*)

Note: if Matters of National Environmental Significance (MNES) are likely to be affected, identify these below.

Justification (indicate any of the following that are relevant):

The activity is on land that contains the following, or the activity may affect:

World Heritage or National Heritage values of a place on the World Heritage List or National Heritage List

the ecology of a Ramsar wetland

nationally listed threatened species and ecological communities, or migratory species

the Commonwealth marine environment.

[Include relevant comments or information, any supporting assessment, and indicate whether Australian Government approval may be required.]

As previously mentioned, the proposed MTB network will not impact World heritage items or places, Ramsar wetlands, or marine environment.

The Snowy Mountains Scheme and Australian Alps National Parks and Reserves, which includes KNP, are on the National Heritage list in the area of the proposed MTB network. The MTB network trails will not impact the Snowy Mountains scheme. For assessment on the impacts to the Australian Alps National Parks and Reserves see **Section 8**.

It is unlikely that that threatened species, populations, and ecological communities would be impacted but the MTB network due to the minimal impact during development and installation. See **Section 8** for more detail.

3.2 Consistency with OEH policy

The proposed development and installation of the MTB network is consistent with the following OEH policies.

Policy name	How proposal is consistent
Cycling Policy	The proposed MTB network will adhere to the procedures within this policy,
No Smoking in Parks Policy	The proposed MTB network will adhere to the procedures within this policy,
Vehicle Access Policy	The proposed MTB network will adhere to the procedures within this policy,

3.3 Type of approval sought

External proponents

The following table provides a list of the types of approval that are being requested from the OEH.

Provide a brief description of the type of approval sought (e.g. 'a lease for visitor accommodation under s.151 NPW Act')	Lease or licence of land for general purposes or sustainable visitor/tourist purposes or adaptive reuse and use of modified natural areas. Authority to harm animals and destroy vegetation – No harm to animals is intended and all harm to vegetation would be minimised. Consent to use of vehicles, horses, camels, vessels and machines in a park, or open gates – a small number of plant would be required for the installation of the MTB network. Consent to erect or use structures – a small number of minor structures are proposed such as shelters, drop toilets, and solar charging stations are included in the proposal for the MTB network.
<input checked="" type="checkbox"/>	s.151 & s.151A NPW Act
<input checked="" type="checkbox"/>	s.1171(1)(b) NPW Act
<input checked="" type="checkbox"/>	cl 7(5) NP&W Reg
<input checked="" type="checkbox"/>	cl 17(2) NP&W Reg

Are there any existing approvals, such as permits, leases, licences or easements, which apply to part of or all of the activity?

<input checked="" type="checkbox"/>	No
<input type="checkbox"/>	Yes Provide details: Click or tap here to enter text.

4 Consultation – general

Details of consultation, including who was consulted, how and when they were consulted, and the results of the consultation are provided below.

Provide details of consultation:	<p>SVC are the proponent of the proposed MTB network so are aware of the additional use of the roads and amenities in the area. Additionally, the manager of roads and infrastructure for SVC was contacted in the second week of November 2020. Information regarding the road crossings in the proposed MTB network (Figure 1) were sent to him. The manager for roads and infrastructure passed the information to TfNSW for comment. At the time of submission of the MTB network proposal, no response had been received therefore two options will be discussed; crossing the highway or installing an underpass at Crossin 1 and Crossing 2.</p> <p>NPWS have been consulted on a number of occasions in person and via email and telecommunications from the conception of the MTB network and throughout the REF process and is in agreement that it aligns with the KNP Plan of Management.</p> <p>The NPWS area manager for Talbingo and Yarrangobilly has taken the concept to the Northern MOU Group for consultation, see Section 5 for more detail.</p> <p>Consultation was undertaken with DPIE– Fisheries in the third week of November 2020 who confirmed that Murry Crayfish and Macquarie Perch were in the Yarrangobilly River. So long as visual inspections were undertaken prior to depositing anything into the river (rock armouring) to mitigate crushing of endangered species that the impact was not perceived to be significant. The rock armouring and bridges would trigger the requirement for a dredging reclamation permit, this may be submitted after the REF has been approved.</p> <p>Where response have been received from correspondence, consulted parties are generally supportive of the proposed MTB network.</p> <p>The MTB proposal will be made publicly available for comment.</p>
<p>Statutory consultations</p> <p>If the activity affects the items below, the proponent must consult with the relevant identified authority.</p>	
	<p><input checked="" type="checkbox"/> local council infrastructure or services (such as stormwater, sewer, roads)</p> <p><input type="checkbox"/> heritage items listed under the local environmental plan (LEP)</p> <p><input type="checkbox"/> flood liable land</p> <p>Consult with the local council under clause 13, Infrastructure SEPP.</p>
	<p><input type="checkbox"/> adjacent to a marine park declared under the <i>Marine Parks Act 1997</i></p> <p><input type="checkbox"/> adjacent to an aquatic reserve declared under the <i>Fisheries Management Act 1994</i></p> <p>Consult with the Marine Park Authority (marine parks) or Department of Primary Industries – Fisheries (aquatic reserves) under clause 16, Infrastructure SEPP.</p>
	<p><input type="checkbox"/> navigable waters</p> <p><input checked="" type="checkbox"/> traffic generating development</p> <p>Consult Roads and Maritime Services under clause 16 or Schedule 3 Infrastructure SEPP.</p>

	<input checked="" type="checkbox"/> works affecting submerged land such as creeks, streams and rivers (and including intermittently submerged areas, such as wetlands and non-perennial creeks) that involve excavation, removing material, depositing material or draining water Consult Department of Primary Industries – Fisheries under s.199 of the Fisheries Management Act.
	If the activity requires a lease of licence under s.151A NPW Act does it require notification and consultation under s.151F and/or s.151G? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

5 Consultation – Native Title

1. Is the land subject to an **Indigenous Land Use Agreement**? (Check the OEH website or with the OEH Aboriginal Heritage and Joint Management Team).

No (go to Question 2)

Yes

If yes, check any relevant provisions of the ILUA including any notification procedures that must be followed.

If relevant, provide details	<p>There is a land claim in the area (Figure XX) but the proposed MTB network has been designed so as not to impact it.</p> <p>The Northern MOU group will be consulted and on the proposed MTB network has been on their discussion agenda for the last 2 of their monthly meetings though these meetings have not eventuated. The proposed MTB network will be discussed on 4 December 2020.</p> <p>The main outcome was that they were not would not provide project endorsement from their perspective until they took the notes and maps to the next Local Aboriginal Land Council meeting which is in the New Year 2021 and they were also going to discuss it with the local Aboriginal community prior to commenting.</p> <p>Other points made if the project was to proceed was that the local Aboriginal community:</p> <ul style="list-style-type: none"> • continue to be consulted throughout the development of the plan; • are made aware of any recommendations or findings coming out of the REF; • are interested in any sites identification and survey work should it be required in the formulation of the REF – see Section 8 and Figure 2 for details; and • are interested in any opportunities there might be for involvement in construction and maintenance of the trail network if and when it eventuates. <p>Concern was raises regarding damaging sites and ongoing erosion if the trail network fails in the long term.</p> <p>Should the proposal be approved, further consultations will be held and comments received during the public display of the proposal will be addressed.</p>
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No other steps are required – proceed to Section 6

2. Has there been a determination of native title applicable to the land or is there a native title claim pending (check the National Native Title Tribunal website)?

No (go to Question 3)

Yes

If yes, contact the OEH Aboriginal Heritage and Joint Management Team. You may need to consult with the native title claimant regarding the proposed activity.

If relevant, provide details	Click or tap here to enter text.
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3. Has native title been **extinguished**?

No or unclear (go to Question 4)

Yes (Note: Clear evidence will be needed to demonstrate extinguishment).

If extinguished, the Native Title Act 1993 procedures do not apply. However, other policies about consultation with Aboriginal people will still be relevant.

If relevant, provide details	Click or tap here to enter text.
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4. If native title is not confirmed as extinguished, does the activity have a **high risk** of adversely affecting native title (e.g. major infrastructure works, new buildings or granting of leases).

No

No further consideration required

Yes

If yes, proponents should discuss with OEH the need to notify and consult Native Title Services Corp or any native title claimants.

If relevant, provide details	Click or tap here to enter text.
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6 Proposed activity (or activities)

6.1 Location of activity

Attached to this REF are a locality plan, map, photographs, and a site plan showing the location and layout of the proposed activity, and provide the following details of the location of the proposed activity site.

Park name	Kosciuszko National Park
Description of location	Talbingo and Yarrangobilly
Site commonly known as (if applicable)	Big Talbingo Mountain, Old Talbingo Mountain, Landers Link, Yarrangobilly

Street address (if available)	Suburb: Talbingo, Yarrangobilly, Pinbeyan, Bogong Peak Wilderness Postcode: NA
Site reference	The proposed MTB network lies with the following boxed area: Top: 620622, 6063705 Bottom: 634389, 6044627 Left: 623571, 6050599 Right: 632247, 6055086
	AMG zone: 55 Reference system: GDA94
Council (Local Government)	Snowy Valleys Council
Title reference (if available)	Folio identifier or volume-folio (if Torrens Land System) NA
	Registered deed number (if Old Land System) NA
NSW State electorate	Wagga Wagga

6.2 Description of the proposed activity

The following section includes a full and comprehensive description of the activity. All aspects of the proposed MTB are described.

Description of the proposed activity – include pre-construction, construction, operation and remediation:

The proposed activities for pre-construction include:

- completing a georeferenced survey of the trail alignment.
- completing a desktop assessment of the area to determine locations of environmental, Aboriginal cultural and heritage, world, national, and commonwealth significance and assess the risk of impact to these identified locations.
- completing a business case to determine viability; and
- once approval have been received, applying for permits and certifications required for dredging and reclamation works, and infrastructure works.

For detailed trail network installation see attached construction method. This will also include installation of carparks, signage, shelters, tables, solar e-bike charging stations, and toilets.

Once the MTB network is operational it will be suitable for use by the public of various competency levels. The signage will clearly stipulate what trails are suitable for which competency level.

Maintenance of the track will be undertaken on an as needed basis and will be the responsibility of SVC in partnership (MOU) with the local MTB group.

The size of the proposed activity footprint:

The approximate size of the activity footprint is 16.5 hectares and includes:

- 10 km of existing fire trail;
- 82 km of new track with a 2-m wide corridor;
- 507 m of raised platform;
- 2 bridges of 20-m length;
- 57 m of rock armouring;
- 2 new hardstand carparks;
- 1 viewing platform;
- associated amenities;
- 2 potential underpasses (may be required for safety to cross the Snowy Mountains Highway).

Ancillary activities, such as advertising or other signage (including any temporary signs, banners or structures promoting an event or sponsorship arrangements), roads, infrastructure and/or bush fire hazard reduction:

A list of ancillary activities associated with the proposed MTB network are presented below, for locations refer to **Figure 1**.

- Carpark at crossing 3 and Lobs Hole Ravine Rd.
- Major trailhead signage at Talbingo Pump Track, crossing 3.
- Minor trailhead signage at crossings 1 and 2.
- Potential underpass crossings at Crossing 1 and Crossing 2 for safety if road crossings are not viable.
- Minor wayfinding signage at all road / trail and trail / trail intersections.
- Charging stations at points identified.
- Toilet facilities at crossing 3.

Shelters, structures, and toilets will be in keeping with the NSW Parks Facilities Manual and will not be a high or extreme risk and therefore do not require certification under the OEH Construction Assessment Procedure.

Proposed construction methods, materials and equipment:

See example construction method detailed method and proposed equipment required for installation of the proposed MTB network (**Attachment 2**).

Materials for signage will be compliant with current NPWS signage guidelines (generally raw steel posts and metal signage) and raised platforms are likely to be steel framed and metal decking. Fibreglass reinforced plastic (FRP) is not preferred as it does not survive well through bushfires.

Receival, storage and on-site management for materials used in construction:

Materials will be received and stored at SVC depot in Talbingo and transported to site generally via helicopter as required therefore there will minimal onsite storage time requiring management.

Earthworks or site clearing including extent of vegetation to be removed:

A 2-m corridor will be cleared for length of trails (approximately 80 km) with removal of small bushes / shrubs only. No trees, other than potential hazards will be removed. Earthworks will be revegetated each day as work progresses.

If the underpasses are required for safety purposes for road crossings, more significant civil works will be required in 2 pre-disturbed areas to install a large culvert crossing under the existing Snowy Mountains Highway.

Environmental safeguards and mitigation measures:

An environmental management plan will be developed for the activity and will include:

- The protection of flora and fauna;
- Control of movement of pedestrians, materials, vehicles, and plant;
- Conservation of site attributes
- Control of discharges and emissions from vehicles and plant.
- Prevention of pollution to land and water
- Soil erosion control
- Mitigation measures to minimise noise and vibrations to fauna and areas of cultural significance.

An example Environmental Management Plan is provided in **Attachment 3**.

Sustainability measures – including choice of materials (such as recycled content) and water and energy efficiency:

In general, the proposed MTB network will adhere to the following:

- designs for energy efficiency;
- material selection Resource use and waste;
- reduce waste by material reuse;
- select materials that will have the least detrimental effects on the ozone, air, land, or waterways; and
- conserve attributes of site.

For bridges, raised platforms, signage, shelters, toilets, etc. metal will be used as much as feasible for better durability and to minimise impacts of weathering and fires.

Construction timetable and staging and hours of operation:

A detailed construction timetable with staging is attached for the 3 years of trail installation. Briefly, a staged approach for installation is proposed with the Big Talbingo descent, old mountain trails, and Yarrangobilly river to be completed in the first stage with the remaining sections to be completed in the second stage.

With no artificial lighting on the tracks proposed for construction would be predominantly limited to daylight hours allowing for seasonal variation. Approximate construction hours will be 7am – 6pm, Monday to Friday.

Operational hours for the MTB network would be predominantly limited to daylight hours with minor use outside of daylight hours with bike lights or torches.

Note: if the activity involves building or infrastructure works, it may require certification to Building Code of Australia or Australian Standards prior to commencement. Further information on the types of projects requiring certification, and how to obtain certification, is contained within the OEH *Construction Assessment Procedures*.

6.3 Objectives of the proposal

Provide details of objectives of the proposal	The objectives of this proposal are to provide an environmental assessment of the area of proposed use for the MTB network trail by: <ul style="list-style-type: none">• identifying areas of Aboriginal, Cultural, and Environmental sensitivity and importance;• determining the risk of the proposed MTB network will have on the identified sensitive areas;• proposing mitigative measures to decrease the risk; and• concluding the overall significance of impacts to Aboriginal, Cultural, and Environmental sensitivity and importance.
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7 Reasons for the activity and consideration of alternatives

Reasons for activity:

The critical drivers for the project are to:

- Help the township of Talbingo and the wider region recover from the 2019-20 bushfires;
- Engage key stakeholders and the community to be part of the future vision for the area;
- Provide long term visitor economic activity, visitor yield and business opportunities;
- Provide increased usage of the holiday accommodation located in Talbingo;
- Showcase the natural beauty and cultural significance of the area through outdoor recreation activities; and
- Establish the Snowy Valley's region as a premier cycling destination.

Alternatives:

- Alternate locations – Tumut, Jindabyne, Tumbarumba, Kiandra.
- Do nothing. This would not bring any additional tourism to the area (KNP, Talbingo, or Yarrangobilly Caves) and would not showcase more areas of KNP.
- Do not provide charging stations for e-bikes. This would either limit the distance/trails that could be used by e-bike or remove their use from the trails completely.

Justification for preferred option:

Talbingo is located within a region with high tourist visitation. Jindabyne to the south and Canberra to the east are both recognised as mountain bike tourism destinations.

Leveraging off these areas, the Talbingo mountain bike trail development has the potential to become a significant attractor for mountain bike tourist to the region, providing additional new business opportunities and increasing the economic benefits to existing businesses.

The recent evolution of electric mountain bikes (eMTB's) has opened up new opportunities to develop longer and more challenging trail networks that, while still suitable for normal mountain bikes, will be more accessible and provide a unique user experience for eMTB riders.

The close proximity of the Talbingo township to the trail network is also a significant benefit, the trails are easily accessible using existing bike paths.

Talbingo currently contains around 400 houses with around 75% of these used as holiday houses. This underlying capacity to accommodate tourist to the area also makes Talbingo attractive as a hub for tourism.

The proposed MTB network trails boast ideal conditions for endure and all mountain, cross country and trail, downhill, dirt jumping, and e- biking activities. With synergies to:

- NPWS – Plan of Management (bike strategy), Yarrangobilly Caves development plan;
- SVC – Hume & Hovell plan Rail Trails Plan, area and visitor profiles;
- DNSW – Riverina Murray Development Masterplan, and strategic plan;
- Bushfire recovery program – NSW state;
- Bushfire recovery Program – MTBA; and
- Red Energy – green energy development.

The proposed routes of the trail network have been developed, designed and located to minimise impacts to environmental, Aboriginal cultural and heritage sensitive areas.

The construction methodology and plant has been developed to minimise the construction corridor and increase the environmental stability of the track as it progresses.

The solar charging stations are the most efficient and resourceful way of bringing power for charging e-bikes in remote location in KNP.

Special note for visitor use, tourism and other proposals requiring a lease or licence under s.151 NPW Act

Proposals seeking a lease or licence under s.151 NPW Act must address the site suitability requirements of the sustainability assessment criteria adopted by the Chief Executive of OEH (**see below**). For further information on completing the assessment of site suitability, refer to the criteria and supporting guidelines.

Site suitability (lease or licence proposals under s.151 NPW Act)	
Site character	The site character for the proposed MTB network is largely unmodified natural and cultural heritage condition.
Landscape context	The surround landscape character for the proposed MTB network largely unmodified natural and cultural heritage condition.

<p>Application of site suitability matrix</p>	<p><i>“May be suitable for bush camping, new campgrounds and a range of built structures and facilities, such as accommodation and venues, but will require detailed strategic site assessment and planning to determine suitability.</i></p> <p><i>Reuse and adaptation of existing buildings is appropriate, subject to detailed assessment of any heritage issues.</i></p> <p><i>In locations where both the site character and landscape context are rated as largely unmodified (orange with cross-hatching) new built facilities or structures may be appropriate but should clearly be limited in scale and density. Typically only minor upgrades will be required to existing park facilities such as toilets, roads and parking. More significant upgrades will require detailed justification.”</i></p> <p>This is in keeping with the proposed activity which proposes the installation of long drop toilets in one location, the extension of 2 previously disturbed areas for carparks, 2 bridges, 500 m of raised platforms, a viewing platform, small shelters, and solar charging stations.</p>
<p>Strategic site assessment (if required by the matrix)</p> <p>Attach any separate assessment report</p>	<p>In locations where both the site character and landscape context are rated as largely unmodified (orange with cross-hatching), sites may be suitable for activities and uses but should generally be limited to those that do not go beyond the following:</p> <ul style="list-style-type: none"> • no more participants than would normally access the area for casual or informal use (the common base-load of park visitation) • a moderate number of temporary structures, located in already disturbed areas, such as marquees, food services and shelters • minor works, such as road closures during the activity, temporary erosion and sediment controls, or temporary car parking • site rehabilitation after the event • some additional park facilities, such as portable toilets • the need to limit access for other park visitors for a period of time (2–3 weeks) <p>While the proposed MTB network activities are not temporary a separate strategic site assessment is not considered necessary at this time. The predicted impact of the MTB and associated activities are described in the REF (herein) with adjoining figures, and the sustainability assessment attached (Attachment 4). The predicted impact of the proposed activities is low across the site.</p>

8 Description of the existing environment

The following sections provides a comprehensive description of the existing environment and surrounding area to the proposed MTB network. Sensitive areas of the environment are identified in this section.

Description of the existing environment:

<p>The site for the proposed MTB network is within KNP which was reserved as a State Park in 1944. The park holds national and state conservation significance due to:</p> <ul style="list-style-type: none"> • containing all NSW’s alpine regions and most of its sub-alpine areas; • the significant history of grazing, gold mining, skiing, and the Snowy Mountains Scheme; • the Aboriginal heritage and cultural significance; • the national and international educational and scientific resource it provides; • the protection it provides numerous habitats and threatened flora and fauna communities; and • containing and protecting significant water catchments.
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Meteorological data:

Based on the weather gauge at Cabramurra SMHEA AWS (72161), which is the closest temperature gauge to Talbingo and Yarrangobilly caves, the mean monthly maximum temperatures range from 21.7 in January and 3.9 in July. The maximum recorded temperature was 25.6 in January and the minimum recorded temperature was 2.4 in July. These temperatures are indicative of those in Talbingo and Yarrangobilly though Cabramurra is at an elevation of 1300 m above sea level, while Yarrangobilly Caves and Talbingo are at elevations of 1160 m and 430 m above sea level, respectively. It will be warmer at lower elevations (<http://www.bom.gov.au/>, 20/11/2020).

Based on the rain gauges at Talbingo (72131) and Yarrangobilly Caves (72141) the average rainfall is 933-1158 mm per annum with the majority falling in August. January and February are generally the driest months of the year (<http://www.bom.gov.au/>, 20/11/2020).

Snow is not often recorded in Talbingo but is recorded frequently at elevations above 1000 m throughout winter.

Topography:

Slope in the region are generally moderate to steep with lower grades on ridgelines, saddles, benches and alluvium near water courses. The ranges are aligned north-east/south-west and have steep incised gully's with creek and rivers. Many of the creeks flow into the Tumut, Yarrangobilly, or Murrumbidgee Rivers and into Talbingo and Tantangara Reservoirs and beyond.

Surrounding land uses:

The surrounding land use is predominantly national park with some residential and commercial areas such as the caves and thermal spring in Yarrangobilly and rural properties, shops, and holiday cottages and caravan parks in Talbingo.

Geology/geomorphology:

The region is the South Eastern Highlands and part of the Lachlan fold belt that that runs through the eastern states of Australia in a general north/south structural trend which is reflected in the topography.

The Lachlan fold belt comprises a complex series of metamorphosed Ordovician to Devonian (Byron Range) sandstones, shales, and volcanic rocks intruded by numerous granite bodies, deformed by four episodes of folding, faulting and uplift. There are four of centres of tertiary basalt flows (OEH 2016, Wagga Wagga 1:250,000 geological sheet).

Soil types and properties:

Soil in the area of the proposed MTB network ranges from loam, clay loam, to light clay with minor peats and comprises of predominantly of Tenosol, with areas of Dermosol, Kandosol, and minor ferrosol and chromosol. Soil pH is generally neutral from 5.5 – 7.3 with no salting evident ([environment.nsw.gov/au](http://environment.nsw.gov.au/), 22/11/2020).

Physiochemical and chemical properties of the soils such as pH, nutrient content and metal bioavailability may have changed slightly in the bushfires at the beginning of 2020 due to the heat and subsequent significant rainfall events. However, with the revegetation observed, these impacts have not been significant enough to inhibit regrowth in the area of the proposed MTB network.

Waterways including wild and scenic rivers:

The main waterways in the area of the proposed MTB network include Lick Hole Creek, Landers Creek, Jounama Creek, and the Yarrangobilly River. There are also a number of unnamed first order water courses in the area.

Catchment values:

The catchments in the area were largely affected by the 2020 bushfires which resulted in soil scouring due to lack of vegetation, however there has been significant regrowth in the area of the proposed MTB network



Talbingo terrain post-bushfire.



Lookout with a view of the scorched landscape.



Re-growth subsequent to the bushfire.

Generally, the catchments are undisturbed with free draining soils. Seepages and springs support continued steam flows in drier periods.

Coastal risk areas:

The proposed MTB trail network will not occur within or directly adjacent to coastal risk areas.

Ecological communities (threatened ecological communities and regionally significant communities):

The Australian Alps and, more specifically, KNP are unique in their climate and provide support to ecological communities, many of which are exclusive to the alpine regions.

The proposed MTB network area falls within 3 Interim Biogeographic Regionalisation of Australia (IBRA) regions and subregions:

- NSW South Western Slopes IBRA region and Inland Slopes IBRA subregion (Talbingo).
- South Eastern Highlands IBRA region and Bondo IBRA subregion (between Talbingo and Yarrangobilly).
- Australian Alps IBRA region and Snowy Mountains IBRA subregion (Yarrangobilly Caves).

Alpine Sphagnum Bogs and Associated Fens and an endangered community known to occur near the proposed MTB network and within the EPBC search area while Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia are an endangered community that may occur within the area. Natural Temperate Grassland of the South Eastern Highlands and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland are critically endangered communities but they are likely and may occur in the area, respectively. A full list of the EPBC search results are provided in **Attachment 1**.

Critically endangered communities under the BC Act 2016 include:

- Mallee and Mallee-Broombush dominated woodland and shrubland, lacking *Triodia*, in the NSW South Western Slopes Bioregion;
- Monaro Tableland Cool Temperate Grassy Woodland, Werriwa Tablelands Cool Temperate Grassy Woodland, and Robertson Basalt Tall Open-forest in the South Eastern Highlands Bioregion;
- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the South Eastern Highlands and NSW South Western Slopes; and
- Snowpatch Feldmark, Snowpatch Herbfield, and Windswept Feldmark in the Australian Alps Bioregion.

Endangered communities under the BC Act 2016 include:

- Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions;
- Inland Grey Box Woodland and Sandhill Pine Woodland in the NSW South Western Slopes Bioregions;
- Montane Peatlands and Swamps of the South Eastern Highlands and Australian Alps Bioregions; and
- Tableland Basalt Forest in the and South Eastern Highlands Bioregions.

The relatively minor works of the proposed MTB network is unlikely to impact these ecological communities with no trees felled unless they pose a hazard to safety, and no impact to wetland areas.

Wetland communities including SEPP 14 wetlands:

The proposed MTB trail network will not occur within or directly adjacent to SEPP 14 wetlands.

SEPP 26 littoral rainforest (or equivalent):

The proposed MTB trail network will not occur within or directly adjacent to SEPP 26 littoral rainforest.

Flora (including flora of conservation significance):

There are several vulnerable, endangered, or critically endangered species or species habitat that may or are likely to occur near the proposed MTB network and in the EPBC search area that are detailed in the EPBC Act Protected Matters Report attached. The species or species habitat that are known to occur within the proposed MTB network area include:

- Vulnerable species or species;
 - Mauve Burr-daisy [7842] (*Calotis glandulosa*);
 - Monaro Golden Daisy [21490] (*Rutidosia leiolepis*); and
 - Austral Toadflax, Toadflax [15202] (*Thesium austral*); and
- Critically endangered species or species;
 - Bago Leek-orchid [84276] (*Prasophyllum bagoense*); and
 - Blue-tongued Orchid, Kiandra Greenhood [22903] (*Pterostylis oreophila*).

There are a number of weeds reported detailed in the EPBC Act Protected Matters Report that are likely to occur within the proposed MTB network area such as tussock and blackberry. With the ease of access the MTB network will provide a weed management program could be implemented.

The proposed MTB network is unlikely to impact or transport these flora communities.



Mauve Burr-daisy (NSW OEH), commonly found in the KNP plains.



Monaro Golden Daisy (NSW OEH), commonly found in the KNP plains.



Austral Toadflax (NSW OEH), observed at Yarrangobilly Caves.



Bago Leek-Orchid (NSW OEH), commonly found in the KNP plains.



Blue-Tongued Orchid (NSW OEH), commonly found in the KNP plains.

Fauna (including fauna of conservation significance):

There are several vulnerable, endangered, or critically endangered species or species habitat including birds, fish, frogs, reptiles, marsupials, and mammals that may or are likely to occur within the proposed MTB network area that are detailed in the EPBC Act Protected Matters Report attached. The species or species habitat that are known to occur within the proposed MTB network area include:

- Fish;
 - Macquarie Perch (*Macquaria australasica*) – Endangered;
- Frogs;
 - Booroolong Frog (*Litoria booroolongensis*) – Endangered;
 - Northern Corroboree Frog (*Pseudophryne pengilleyi*) - Critically Endangered;
- Mammals;
 - Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) (*Dasyurus maculatus maculatus*) – Endangered;
 - Broad-toothed Rat (mainland), Tooarrana (*Mastacomys fuscus mordicus*) – Vulnerable;
 - Greater Glider (*Petauroides Volans*) – Vulnerable; and
 - Smoky Mouse, Konoom (*Pseudomys fumeus*) – Endangered.

There are a number of threatened species or species habitat that may or are likely to occur within the proposed MTB network area under Commonwealth Land that are detailed in the EPBC Act Matters Report attached. Threatened species or species habitat that are known to occur in the area include:

- Satin Flycatcher (*Myiagra cyanoleuca*);
- Rufous Fantail (*Rhipidura rufifrons*);
- Great Egret, White Egret (*Ardea alba*);
- White-bellied Sea-Eagle (*Haliaeetus leucogaster*)

A number of feral birds and animals are also identified as species or species habitat that may or are likely to occur within the proposed MTB network area, many of which have been observed first hand such as, dogs, cats, horses, rabbits, deer, pigs, and foxes.

The proposed MTB network is unlikely to impact these species or species habitat (**Figures 3 – 4e**).

Area of outstanding biodiversity value declared under the BC Act:

The proposed MTB trail network will not occur within or directly adjacent to an area of outstanding biodiversity values as declared under the BC Act.

SEPP 44 koala habitat:

As stated in Section 3.1 the Snowy Valleys LGS is listed in Schedule 1 of SEPP44 so must be considered, however;

- based on a recent survey performed for the Snowy 2.0 Environmental Impact Assessment, no Koala's or scats were found in the area;
- the proposed development and installation of the proposed MTB network would be done in such a way to minimise the impact to nature, flora, and fauna; and
- only bushes and saplings will be removed during the installation, no living established trees will be felled. If large established trees that have been damaged in the recent bushfires pose a safety risk, they will be felled in a safe manner in consultation with NPWS.

Therefore, there is a negligible risk to SEPP 44 koala habitat.

Wilderness (either nominated or declared):

The proposed MTB trail network will not occur within or directly adjacent to Wilderness areas.

Aboriginal cultural heritage:

Aboriginal people have lived in the Southern Highlands and its surrounding areas for a minimum of 21,000 years with evidence of occupation dating back to the Late Pleistocene (DEC 2006). A number of Aboriginal groups' traditional home were in the Southern Highlands and Australian Alps Bioregion but the Walgal people occupied the northern limits of KNP from Kiandra north which encompasses the proposed MTB network.

Evidence of Aboriginal occupation is observed in KNP and range from remains of campsites, ceremonial grounds, burial sites, rock art, scarred trees, and grinding grooves (DEC 2006).

The proposed MTB trail network will not impact Aboriginal items and areas of significance identified in **Figure 2**.

National/State/local natural or cultural heritage values:

The Australian Alps National Parks and Reserves and the Snowy Mountains Scheme are listed as National Heritage Properties under the EPBC Act. This is due to the history extending from the 1820's and the early settlers, the 1830's and the pastoralism and transhumant grazing, to the gold rush in 1859-1860, and scientific exploration. The Snowy Scheme was built through the twentieth century when scientific research progressed in the area, as did tourism and recreation.

The proposed MTB trail network will not impact natural or cultural areas of significance identified.

Vegetation of cultural landscape value:

(e.g. gardens and settings, introduced exotic species or evidence of broader remnant land uses)

The proposed MTB trail network will not occur within or directly adjacent to vegetation of cultural landscape value.

Other cultural heritage values:

The proposed MTB trail network will not occur within or directly adjacent to other cultural heritage values other than those already stated.

Recreation values:

Current recreation values in the area of the proposed MTB trail network are an important resource to community groups and individuals and includes walking, horse riding, boating, fishing, and camping.

Scenic and visually significant areas:

The proposed MTB trail network will not occur within scenic or visually significant areas though the proposed trails will lead to lookout areas that are less frequented currently. The trail network will provide increased opportunities for the local and visiting community to view areas, some of which have limited access by foot.

Education and scientific values:

KNP is a valuable scientific and educational resource containing significant water catchments, all of the NSW's alpine areas, unique biodiversity, and species and species habitats of ecological significance.

Interests of external stakeholders (e.g. adjoining landowners, leaseholders):

The proposed MTB trail network will be primarily in KNP linking to Yarrangobilly Caves and Talbingo. This will provide opportunity for day trips or extended stays:

- helping the township of Talbingo and Yarrangobilly recover from the 2019-20 bushfires;
- providing long term visitor economic activity, visitor yield and business opportunities; and
- provide increased usage of the holiday accommodation in the area.

Matter of National Environmental Significance under the EPBC Act:

The Australian Alps National Parks and Reserves and the Snowy Mountains Scheme are listed as National Environmental Significance under the EPBC Act.

Threatened flora, fauna, and ecological communities are detailed above and presented along the alignment in **Figures 3-4e**.

The proposed MTB trail network is unlikely to impact any Matters of National Environmental Significance.

9 Impact assessment

This part of the REF provides an analysis of **all possible impacts** from the proposed activity and a description of **any proposed mitigation measures**.

9.1 Physical and chemical impacts during construction and operation

	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or NA)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/mitigation measures
1. Is the proposal likely to impact on soil quality or land stability?	<input checked="" type="checkbox"/>	Low / negative	<p>MTB network installation works will include a 2-m corridor will be cleared for length of trails (82 km) with removal of small bushes / shrubs only. This will be progressed in approximately 200 m sections and the construction area rehabilitated before proceeding along the alignment.</p> <p>Rock outcrops and berms will be installed on steeper side slopes to increase land stability during trail use.</p> <p>If underpasses are required, civil experts will be contracted to complete this work to Australian Standards</p> <p>Once installed the MTB network users will follow the designated trails so no further impacts will occur,</p>	<ul style="list-style-type: none"> - Existing trails will be utilised to access location during construction. - Existing fire trails will be utilised in trail network where feasible. - No trees, other than potential hazards will be removed. - Earthworks will be revegetated each day as work progresses. - Trail installation will include trail stability which will be monitored in use and maintenance. - Contract civil experts to install underpasses if required.

	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or NA)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/mitigation measures
2. Is the activity likely to affect a waterbody, watercourse, wetland or natural drainage system?	<input checked="" type="checkbox"/>	Low / negative	Bridges will span larger watercourse, and the trail design will take natural drainage of areas into consideration to included raised platforms or rock armouring where required to let water continue to flow in areas that the trail crosses. No impacts will occur during operation of the trails.	- Install rock armouring that still allows water flow through while raising the trail tread to higher than the surrounding trail and to allow the water to flow over the armouring in high flows minimising erosion. - Install raised platforms insensitive areas or areas of higher water flow. - Install bridges specifically designed and engineered to each crossing. - An application for a Dredging and Reclamation Permit from fisheries will be made on approval of the REF.
Notes:				
<ul style="list-style-type: none"> a public authority does not require approval under the Water Management Act to undertake various works (e.g. excavating or depositing material) within 40 metres of a river; however, the REF should take account of the Guidelines for Controlled Activities prepared by the Department of Primary Industries – Water consultation with Department of Primary Industries – Fisheries may be required for certain works, under s.199 Fisheries Management Act - see Section 4. 				
3. Is the activity likely to change flood or tidal regimes, or be affected by flooding?	<input checked="" type="checkbox"/>	Low / negative	The proposed MTB trail network will not occur within areas likely to flood though the Yarrangobilly River will increase in flow and water level during significant precipitous events.	The bridges will be designed to withstand the increased flows and water levels from significant precipitous events.
4. Is the activity likely to affect coastal processes and coastal hazards, including those projected by climate change (e.g. sea level rise)?	<input type="checkbox"/>	NA	The proposed MTB trail network will not occur within or directly adjacent to coastal risk areas.	NA

Review of Environmental Factors

	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or NA)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/mitigation measures
5. Does the activity involve the use, storage, or transport of hazardous substances or the use or generation of chemicals, which may build up residues in the environment?	<input type="checkbox"/>	Low / negative	<p>The proposed MTB trail network will require the storage, transport, or NPWS approved weed killing chemicals that will not be sprayed near water courses.</p> <p>Diesel will be required for the excavator. The excavator will not be refuelled within 50 m of a watercourse and will be appropriately banded during refuelling.</p>	<ul style="list-style-type: none"> - Use only NPWS approved chemicals. - Store chemicals in appropriately banded areas. - Do not store or spray chemicals near water courses. - Do not undertake refuelling activities within 50 m of a watercourse. - Transport diesel to site in an appropriately stored and banded vehicle.

	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or NA)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/mitigation measures
6. Does the activity involve the generation or disposal of gaseous, liquid or solid wastes or emissions?	<input checked="" type="checkbox"/>	Low / negative	<p>During the installation of the MTB trail network the plant and vehicles will produce emissions.</p> <p>No liquid waste will be produced during construction.</p> <p>Dust may be created by vehicles travelling to the construction area.</p> <p>All waste generated during trail installation will be removed from site and disposed of accordingly.</p> <p>No soil or vegetation, with the exception of invasive weeds, will be removed from site.</p> <p>During operation of the MTB trail network, patrons will be advised to take all litter with them.</p> <p>Drop toilets will be installed as per NSW guidelines with tank water for handwashing.</p>	<ul style="list-style-type: none"> - Implement a strategy to reduce the quantity of waste, including minimising and recycling packaging. - Keep emissions within statutory or other required limits. - Use equipment in good repair/condition. - Bund around plant when not in use. - Use low water demand fittings & appliances (water conserving taps). - Implement appropriate disposal procedures for all waste items, including using lawful places for disposal, recording and reporting on the method and location of disposal and any non-conformances - Schedule works to minimise movement of plant and materials around site. - Suppress dust with water spray if needed. - Material created from underpasses will be utilised in track construction if suitable or will be disposed of according to NSW guidelines.

	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or NA)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/mitigation measures
7. Will the activity involve the emission of dust, odours, noise, vibration or radiation in the proximity of residential or urban areas or other sensitive locations?	<input checked="" type="checkbox"/>	Negligible	<p>There are no residents or urban areas in proximity to the works.</p> <p>Sensitive ecological areas will be minimally impacted by noise, dust, and vibrations during construction.</p> <p>Dust may be created by vehicles travelling to the construction area.</p> <p>There will be no emission of significant odours, radiation, or vibrations during the operation of the proposed MTB network with minimal noise.</p>	<ul style="list-style-type: none"> - Construction works will commence between 7am and 6pm Monday to Friday. - Keep emissions within statutory or other required limits. - Suppress dust with water spray if needed. - Use equipment in good repair/condition. - Cover materials during transport.

* If yes, check box and all columns need to be completed. If no, leave unchecked and write 'NA' in the third and fourth columns.

9.2 Biological impacts during construction and operation

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or NA)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
1. Is any vegetation to be cleared or modified? (includes vegetation of conservation significance or cultural landscape value)	<input checked="" type="checkbox"/>	Low / negative	<p>A small 2-m wide corridor of surface vegetation will be cleared through the 82 km of MTB network in approximately 200 m sections.</p> <p>Much of this network will use existing fire trail.</p> <p>The proposed trail diverts around areas of significance.</p>	<ul style="list-style-type: none"> - The MTB network will be designed to minimise disturbance to areas of ecological and cultural landscape significance. - Reuse all disturbed sods / topsoil on the Site. - Vegetations and branches etc., removed will be used as hatching in the rehab works. - Clear, construct, reinstate, and rehabilitate the track construction area progressively.
2. Is the activity likely to have a significant effect on threatened flora species, populations, or their habitats, or area of outstanding biodiversity value (refer to threatened species assessment of significance (5 part test))?	<input checked="" type="checkbox"/>	Low / negative	<p>A small 2- m wide corridor of surface vegetation will be cleared through the 82 km of MTB network</p> <p>Much of this network will use existing fire trail.</p> <p>The proposed trail diverts around areas of significance.</p> <p>Based on the threatened species assessment, there will be minimal impact to threatened flora in the area (Attachment 5).</p>	<ul style="list-style-type: none"> - The MTB network will be designed to minimise disturbance to areas of flora and biodiverse significance. - Utilise pre-disturbed areas so far as possible in the design. - Use raised platforms to avoid impacts in areas of significance where the MTB network cannot be diverted.

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or NA)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
3. Does the activity have the potential to endanger, displace or disturb fauna (including fauna of conservation significance) or create a barrier to their movement?	<input checked="" type="checkbox"/>	Low / negative	<p>No barriers will be created during construction or operation or the proposed MTB network.</p> <p>Endangerment to fauna is not expected as no trees are being felled (other than those that pose a threat to safety as a result of the 2020 bushfires), use of the track will be in the day light, and the general speed of the bikes will be slow enough to avoid fauna should an interaction arise.</p>	<ul style="list-style-type: none"> - The MTB network will be designed to minimise disturbance to areas of sensitive fauna. - Use raised platforms to avoid impacts in areas of significance where the MTB network cannot be diverted.
4. Is the activity likely to have a significant effect on threatened fauna species, or their habitats, or areas of outstanding biodiversity value (refer to threatened species assessment of significance (5 part test))?	<input checked="" type="checkbox"/>	Low / negative	<p>The proposed MTB network will not go within 150 m of a critically endangered species and will not go within 14 m of a vulnerable species.</p> <p>Based on the threatened species assessment, there will be minimal impact to threatened species or the habitat in the area (Attachment 5).</p>	<ul style="list-style-type: none"> - The MTB network will be designed to minimise disturbance to areas of significance. - Utilise pre-disturbed areas so far as possible in the design. - Use raised platforms to avoid impacts in areas of significance where the MTB network cannot be diverted.

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or NA)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
5. Is the activity likely to impact on an ecological community of conservation significance?	<input checked="" type="checkbox"/>	Low / negative	The proposed MTB network will not go within 150 m of a critically endangered species and will not go within 14 m of a vulnerable species. Based on the threatened species assessment, there will be minimal impact to threatened ecological communities in the area (Attachment 5).	<ul style="list-style-type: none"> - The MTB network will be designed to minimise disturbance to areas of conservation significance. - Utilise pre-disturbed areas so far as possible in the design. - Use raised platforms to avoid impacts in areas of significance where the MTB network cannot be diverted.
6. Is the activity likely to have a significant effect on an endangered ecological community or its habitat (refer to threatened species assessment of significance (5 part test))?	<input checked="" type="checkbox"/>	Low / negative	The proposed MTB network will not go within 150 m of a critically endangered species and will not go within 14 m of a vulnerable species. Based on the threatened species assessment, there will be minimal impact to threatened ecological communities in the area (Attachment 5).	<ul style="list-style-type: none"> - The MTB network will be designed to minimise disturbance to areas of endangered communities. - Utilise pre-disturbed areas so far as possible in the design. - Use raised platforms to avoid impacts in areas of significance where the MTB network cannot be diverted.
7. Is the activity likely to cause a threat to the biological diversity or ecological integrity of an ecological community?	<input checked="" type="checkbox"/>	Negligible / negative	The proposed MTB network has been designed to have minimal impact on the surrounding environment.	<ul style="list-style-type: none"> - The MTB network will be designed to minimise disturbance to areas of biological and ecological significance. - Utilise pre-disturbed areas so far as possible in the design. - Use raised platforms to avoid impacts in areas of significance where the MTB network cannot be diverted.

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or NA)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
8. Is the activity likely to introduce noxious weeds, vermin, feral species or genetically modified organisms into an area?	<input checked="" type="checkbox"/>	Negligible / negative	Vehicles will be washed on the way in and out to	<ul style="list-style-type: none"> - Weed spraying for the first 3 years along the trail corridor targeting blackberry and St. Johns Wart that has been observed on site. - Vehicle and plant wash to stop the spread of weeds. - Appropriate disposal of weeds during clearing, these will not be utilised in hatching area in rehab.
9. Is the activity likely to affect any declared area of outstanding biodiversity value?	<input type="checkbox"/>	NA	The proposed MTB trail network will not occur within or directly adjacent to an area of outstanding biodiversity values as declared under the BC Act.	NA
11. Is the activity likely to affect any joint management agreement under the BC Act?	<input type="checkbox"/>	NA	There are currently no joint management agreements under the BC Act in the area of the proposed MTB network.	NA

9.3 Community impacts during construction and operation

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
1. Is the activity likely to affect community services or infrastructure?	<input checked="" type="checkbox"/>	Low / positive	<p>The proposed MTB could bring tourism to the local area increasing transport on public roads.</p> <p>The proposed MTB network may affect community water, drainage, waste management through increased tourism in the area but not by a volume more significant that the systems are designed to manage.</p> <p>Solar Power will be used for e-bike charging stations so this will not impact on community services.</p>	<p>- Should events be held in the area, provide additional infrastructure (i.e. portable toilets, additional waste receptacles) to minimise impacts to community infrastructure and services.</p>
2. Does the activity affect sites of importance to local or the broader community for their recreational or other values or access to these sites?	<input checked="" type="checkbox"/>	Medium / positive	<p>The proposed MTB network will provide the community with the opportunity to access area of the park close to home that are currently only accessible to experienced hikers.</p>	<p>- Publicly exhibit the proposal to promote community support.</p> <p>- Consider all suggestions and comments provided by the community during the public exhibition of the proposal and incorporate feedback where feasible.</p>

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
3. Is the activity likely to affect economic factors, including employment, industry and property value?	<input checked="" type="checkbox"/>	Medium / positive	<p>There is an expected increase in tourism with the operation of the proposed MTB network increasing income to the area and therefore employment opportunities. More details of economic factors are provided in the business case provided with the MTB proposal.</p> <p>For the construction of the proposed MTB network local labour will be used.</p>	<ul style="list-style-type: none"> - Publicly exhibit the proposal to promote community support. - Complete a business case analysis to assess the economic feasibility of the proposed MTB network.
4. Is the activity likely to have an impact on the safety of the community?	<input type="checkbox"/>	NA	The safety of the community should not be impacted by the proposed MTB network.	NA

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
5. Is the activity likely to cause a bushfire risk?	<input checked="" type="checkbox"/>	Low / negative	<p>Construction of the proposed MTB is year-round, however activities performed on total fire ban days would be limited. Fire extinguishers will be carried by contractors installing the track and appropriate measures will be in the Safety Management Plan regarding who to contact and what to do in the event of a bushfire.</p> <p>During operation the activity is no likely to cause a bushfire risk. Trail users will be reminded that, in line with OEH policy, no smoking is permitted in KNP. Brief instructions on who to call and what to do in the event of a bushfire will be included on trail signage.</p>	<ul style="list-style-type: none"> - On total fire ban days perform construction tasks that do not pose a bushfire risk. - Prepare a Safety Management Plan incorporating instructions on what to do and who to call in the event of a bushfire. - Remind users that no smoking is permitted in KNP on trail signage. - Provide numbers and information on what to do in the event of a bushfire on trail signage.
6. Will the activity affect the visual or scenic landscape? This should include consideration of any permanent or temporary signage (e.g. signs advertising an event and related sponsorship).	<input checked="" type="checkbox"/>	Low / negative	<p>The proposed MTB network will not impact the visual landscape, as the trail will largely not be visible from other vantage points due to tree cover. However, the MTB network will enable greater views of the landscape during usage.</p> <p>Signs will be installed at trail heads, charging locations, and carparks but will be in keeping with KNP policy.</p> <p>Temporary signage may be used for events utilising the trail but these will be removed at the completion of the event.</p>	<ul style="list-style-type: none"> - Minimise visual impact to the surrounding area by design of the MTB network. - Signage installed will be in accordance with KNP policies. - Temporary signage will be removed as soon as it is no longer required. - Shelters and toilets will be in keeping with the NSW Parks Facilities Manual.

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
7. Is the activity likely to cause noise, pollution, visual impact, loss of privacy, glare or overshadowing to members of the community, particularly adjoining landowners?	<input type="checkbox"/>	NA	The proposed MTB network is in KNP with no impact to adjoining landowners. All proposed areas are already public access.	NA

9.4 Natural resource impacts during construction and operation

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
1. Is the activity likely to result in the degradation of the park or any other area reserved for conservation purposes?	<input checked="" type="checkbox"/>	Low / negative	The proposed MTB network will not lead to the degradation of KNP. The trails will be maintained and the community using the trails will be reminded on signage that their actions should be in keeping with the park themes, "leave only tracks". Users will be reminded to remain on the designated trails to avoid impacts to areas of sensitive flora and fauna off the trails.	- Incorporate keep messages to users on signage including regarding no littering and remaining on tracks.

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
2. Is the activity likely to affect the use of, or the community's ability to use, natural resources?	<input checked="" type="checkbox"/>	Low / positive	<p>This proposed MTB network will enhance the community's ability to enjoy the area.</p> <p>No other natural resources, i.e. water, air, or minerals, will be impacted by the proposed MTB network.</p>	<ul style="list-style-type: none"> - Place the proposal for the MTB trail network on public exhibition to increase community awareness. - Review community feedback from public exhibition and to incorporate the responses to the MTB network design where appropriate.
<p>3. Is the activity likely to involve the use, wastage, destruction or depletion of natural resources including water, fuels, timber or extractive materials?</p> <p>This should include opportunities to utilise recycled or alternative products.</p>	<input checked="" type="checkbox"/>	Low / negative	<p>The proposed MTB network will not involve the wastage of water, fuels, or minerals.</p> <p>The only trees that will be felled for this activity will be those that pose a hazard to safety as a result of the 2020 bushfires. These trees will be used as boundary markers of the track or carparks.</p> <p>Vegetation removed during the clearing of areas will be used for rehabilitation next to the cleared areas that is no longer required for construction.</p> <p>The materials used in construction will include metal signage and bridges to increase longevity against the risk of bushfires and decreasing the environmental risk of contamination of the materials resulting from fires. Some more environmentally friendly products contain fibres which, when burnt are more difficult to recover.</p>	<ul style="list-style-type: none"> - Reuse vegetation from clearing in rehabilitation. - Use materials that have a low environmental impact and a high longevity. - Use materials that minimise environmental impacts after bushfires.

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
<p>4. Does the activity provide for the sustainable and efficient use of water and energy?</p> <p>Where relevant to the proposal, this should include consideration of high efficiency fittings, appliances, insulation, lighting, rainwater tanks, hot water and electricity supply.</p>	<input checked="" type="checkbox"/>	High / positive	<p>The proposed MTB project proposes the installation of solar powered charging stations to charge e-bikes that will be using the trail.</p> <p>Rainwater tanks will be used for handwashing at toilets which will be long drop toilets minimising the requirement of water.</p> <p>Taps at the toilets will be high water efficiency with an automatic off so they do not waste water.</p> <p>No lighting, building insulation, or hot water will be required.</p>	<ul style="list-style-type: none"> - Use high efficiency taps that automatically turn off. - Use solar powered charging stations.

9.5 Aboriginal cultural heritage impacts during construction and operation

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
1. Will the activity disturb the ground surface or any culturally modified trees?	<input checked="" type="checkbox"/>	Negligible / negative	The only areas of aboriginal significance have been identified from an AHIMS search in the proposed MTB network paths are those in areas already impacted such as those at Yarrangobilly Caves.	<ul style="list-style-type: none"> - If any items of possible aboriginal significance are identified during construction of the trail, contact NPWS and the relevant Aboriginal groups for confirmation of item significance. - No culturally modified trees will be felled unless they pose a safety hazard as a result of the 2020 bushfires.
2. Does the activity affect known Aboriginal objects or Aboriginal places? Include all known sources of information on the likely presence of Aboriginal objects or places, including AHIMS search results.	<input checked="" type="checkbox"/>	Negligible / negative	The only areas of aboriginal significance have been identified from an AHIMS search in the proposed MTB network paths are those in areas already impacted such as those at Yarrangobilly Caves.	<ul style="list-style-type: none"> - If any items of possible aboriginal significance are identified during construction of the trail, contact NPWS and the relevant Aboriginal groups for confirmation of item significance. - If any Aboriginal objects or landscape features are identified along the proposed MTB trail network, the trail may be realigned to a required distance, where feasible.

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
<p>3. Is the activity located within, or will it affect, areas:</p> <ul style="list-style-type: none"> - within 200m of waters* - within a sand dune system* - on a ridge top, ridge line or headland - within 200m below or above a cliff face - within 20m of or in a cave, rock shelter or a cave mouth? 	<input checked="" type="checkbox"/>	Low / negative	<p>As defined in Guidelines for Preparing a Review of Environmental Factors, the proposed MTB network will be located:</p> <ul style="list-style-type: none"> - Within 200m of waters; - on a ridge top, ridge line or headland; and - within 200m below or above a cliff face. <p>However, the waters will not be used and will remain flowing, they will be crossed either using rock armouring, a raised platform, or a bridge.</p>	<ul style="list-style-type: none"> - If any items of possible aboriginal significance are identified during construction of the trail, contact NPWS and the relevant Aboriginal groups for confirmation of item significance. - If any Aboriginal objects or landscape features are identified along the proposed MTB trail network, the trail may be realigned to a required distance, where feasible.
4. If Aboriginal objects or landscape features are present, can impacts be avoided?	<input checked="" type="checkbox"/>	Negligible / negative	No Aboriginal objects or landscape features have been identified along the proposed MTB trail network from the AHIMS search.	If any Aboriginal objects or landscape features are identified along the proposed MTB trail network, the trail may be realigned to a required distance.

	Applicable?*	Likely impact (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/mitigation measures
<p>5. If the above steps indicate that there remains a risk of harm or disturbance, has a desktop assessment and visual inspection[^] been undertaken (refer to the Due Diligence Code)?</p> <p>[^] For activities proposed by OEH, at a minimum, this should be undertaken by an OEH employee with Aboriginal Site Awareness training and relevant practical experience, as approved by an Area Manager.</p>	<input type="checkbox"/>	NA	There is minimal risk to Aboriginal areas of significance with the proposed MTB network and with the proposed mitigation measures there is negligible remaining risk.	NA
6. Is the activity likely to affect wild resources or access to these resources, which are used or valued by the Aboriginal community?	<input type="checkbox"/>	NA	No resources used or valued by the Aboriginal community other than the land for the proposed MTB network will be used.	NA

Special explanatory notes:

- If the above assessment indicates that there is still a reasonable risk or potential that Aboriginal objects, Aboriginal places or sensitive landscape features could be adversely affected by a proposal, consistent with the precautionary principle, it should either be re-considered or further detailed investigations undertaken.
- If it is concluded that an activity will have unavoidable and justified impacts on Aboriginal objects or Aboriginal places, the proponent should consider applying for an Aboriginal Heritage Impact Permit (AHIP) under s.90 of the NPW Act.

9.6 Other cultural heritage impacts during construction or operation

	Applicable?*	Likely impact (negligible, maintenance, minor, major, contentious; or NA)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/mitigation measures
<p>1. What is the impact on places, buildings, landscapes or moveable heritage items?</p> <p>Attach relevant supporting information where required, such as a heritage impact statement.</p>	<input checked="" type="checkbox"/>	Low / negative	<p>The Australian Alps National Parks and Reserves and the Snowy Mountains Scheme are listed as National Heritage Properties under the EPBC Act, due to the history extending from the 1820's and the early settlers, the 1830's and the pastoralism and transhumant grazing, to the gold rush in 1859-1860, and scientific exploration. The Snowy Scheme was built through the twentieth century when scientific research progressed in the area, as did tourism and recreation.</p> <p>The proposed MTB trail network will have minimal impact natural or cultural areas of significance.</p> <p>The proposed MTB trail network will not impact on heritage buildings or movable items.</p>	<p>- If any items of possible heritage significance are identified during construction of the trail, contact NPWS for confirmation of item significance.</p> <p>- Minimise visual impact to the surrounding area by design of the MTB network.</p>

	Applicable?*	Likely impact (negligible, maintenance, minor, major, contentious; or NA)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/mitigation measures
2. Is any vegetation of cultural landscape value likely to be affected (e.g. gardens and settings, introduced exotic species, or evidence of broader remnant land uses)?	<input type="checkbox"/>	NA	The proposed MTB trail network will not occur within or directly adjacent to vegetation of cultural landscape value.	NA

9.7 Matters of national environmental significance under the EPBC Act

	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or NA)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/mitigation measures
Is the proposal likely to impact on matters of national environmental significance as follows:				

	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or NA)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/mitigation measures
- listed threatened species or ecological communities	<input checked="" type="checkbox"/>	Low / negative	The proposed MTB network will not go within 150 m of a critically endangered species and will not go within 14 m of a vulnerable species.	<ul style="list-style-type: none"> - The MTB network will be designed to minimise disturbance to areas of endangered communities. - Utilise pre-disturbed areas so far as possible in the design. - Use raised platforms to avoid impacts in areas of significance where the MTB network cannot be diverted.
- listed migratory species	<input type="checkbox"/>	NA	No trees, other than those that pose a risk to safety as a result of the 2020 bushfires, will be felled so no bird habitat will be lost.	NA
- the ecology of Ramsar wetlands	<input type="checkbox"/>	NA	A search of relevant databases was undertaken to determine if any Ramsar wetland communities were within the area proposed for the MTB trail network. The searched identified no Ramsar wetlands in or adjacent to the proposed MTB trail network.	NA
- Commonwealth marine environment	<input type="checkbox"/>	NA	The proposed MTB trail network is not in or near a marine environment.	NA
- world heritage values of world heritage properties	<input type="checkbox"/>	NA	No world heritage values of world heritage properties are in the area of the proposed MTB network.	NA

	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or NA)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/mitigation measures
- the national heritage values of national heritage places	<input checked="" type="checkbox"/>	Low / negative	<p>The Australian Alps National Parks and Reserves and the Snowy Mountains Scheme are listed as National Heritage Properties under the EPBC Act, due to the history extending from the 1820's and the early settlers, the 1830's and the pastoralism and transhumant grazing, to the gold rush in 1859-1860, and scientific exploration. The Snowy Scheme was built through the twentieth century when scientific research progressed in the area, as did tourism and recreation.</p> <p>The proposed MTB trail network will not impact natural or cultural areas of significance.</p>	<p>- If any items of possible heritage significance are identified during construction of the trail, contact NPWS for confirmation of item significance.</p> <p>- Minimise visual impact to the surrounding area by design of the MTB network.</p>

Note:

- The Protected Matters Search Tool can assist in checking for matters of national environmental significance.

10 Proposals requiring additional information

10.1 Lease or licence proposals under s.151 NPW Act

Proponents must complete and submit a **Sustainability Assessment** together with the REF. This also applies where OEH is the proponent for projects of the kind listed in s.151A, NPW Act.

For information on the sustainability assessment criteria and guidelines, including assessment templates, go to the Development guidelines webpage.

Indicate which sustainability assessment is attached:

- special activities and uses (involving more than 400 people) – Sustainability Assessment **Template 2**
- built structures and facilities – Sustainability Assessment **Template 3**.

Note that for **minor activities and uses** (usually events and similar proposals involving fewer than 400 people), a streamlined and combined REF and Sustainability Assessment template is available (**Template 1**).

A sustainability assessment is provided in **Attachment 4**.

11 Threatened species assessment of significance (5 part test)

Threatened species and ecological communities, or their habitats, which are likely to be affected by the activity are identified and considered in an attachment to this REF (**Attachment 5**).

12 Summary of impacts

Below is a summary of the impacts and cumulative impacts of the activity based on the classification of individual impacts as low, medium or high adverse, negligible or positive.

Category of impact	Significance of impacts		
	Extent of impact	Nature of impact	Environmentally sensitive features
Physical and chemical	Low	<p>There will be minor impacts to the landscape during the installation of the proposed MTB network but the trails will not generally result in visual impacts from viewpoints or the air due to canopy foliage.</p> <p>With the progressive construction methodology, no more than 200 m of track will be impacted at a time, minimising the chances of sediment erosion.</p> <p>Weed killing chemicals and diesel will be transported for use on the site.</p>	<p>Sediment erosion will be managed by progressive rehabilitation.</p> <p>Water crossings will utilise bridges and raised platforms.</p> <p>Pollution from chemicals and diesel during transport and day storage on site. These will be transported in a suitably bunded vehicle and will be stored in a bunded area on site.</p> <p>Leaching of chemicals after use. No weed spraying will take place near watercourses.</p> <p>Diesel spills during refuelling. No refuelling will be performed within 50 m of a watercourse.</p>
Biological	Negligible	No impact to fauna, flora, or ecologically sensitive areas are anticipated.	There are known locations of significance that will be protected by alignment avoidance and raised platforms.
Natural resources	Negligible	No impact on natural resources, other than an increased access to the land results from the proposed MTB network.	No resources will be removed or diverted from the site during for the proposed MTB network. Only hazardous trees will be felled and will be used for trail and carpark delineation.
Community	Positive	Increase in tourism and economic stability in the local area.	NA



Cultural heritage	Low	The proposed MTB network will be constructed in KNP which is within the Australian Alps National Park but will not have a significant impact. No items or areas of cultural heritage or aboriginal heritage will be impacted.	There are known locations of significance that will be protected by alignment avoidance.
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13 Conclusions

In conclusion:

- there is not likely to be a significant effect on the environment therefore no environmental impact statement is required;
- there is not likely to be a significant effect on threatened species, populations, ecological communities or their habitats therefore no species impact statement is required;
- the activity is in respect of land that is not, full or part of, critical habitat therefore no species impact statement is required;
- the activity is not likely to significantly impact matters of national environmental significance listed under the Commonwealth Environment Protection and Biodiversity Conservation Act; and
- the activity will not require certification to the Building Code of Australia, Disability (Access to Premises – Buildings) Standards 2010 or Australian Standards in accordance with the OEH Construction Assessment Procedure, as the shelters and structures will be built using the process and standard designs in the Park Facilities Manual.

The trails will be constructed using techniques that minimise the impact on the surrounding environment. Trails will be aligned to integrate with the contours of the land and to avoid areas of cultural and environmental significance. Where required, elevated platforms will be used to elevate the trail above water crossings or low-lying areas.

14 Supporting documentation

Supporting information includes, but is not limited to: threatened species assessment of significance (5-part test); figures; construction information of similar projects, maps; etc.

Document title	Author	Date
Attachment 1 - EPBC Act Protected Matters Report	Department of Agriculture, Water, and the Environment	14/10/2020
Attachment 2 - Example Construction Method	Natural Trails	2016
Attachment 3 - Example Environmental Management Plan	Natural Trails	2016
Attachment 4 - Sustainability Assessment	High Country Environmental	2/12/2020
Attachment 5 - Threatened Species Assessment of Significance	High Country Environmental	29/11/2020
Figures	High Country Environmental	2/12/2020

15 Fees

On receipt of the REF please invoice the proponent, SVC for the initial assessment fee (\$170).

16 Signature of proponent

Signature	
Name (printed)	Kylie Bradley
Position	Coordinator Place Activation
Date	

Attachment 1

EPBC Search Results

Talbingo and Yarrangobilly Mountain Bike Trail Network





EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 14/10/20 06:41:42

[Summary](#)

[Details](#)

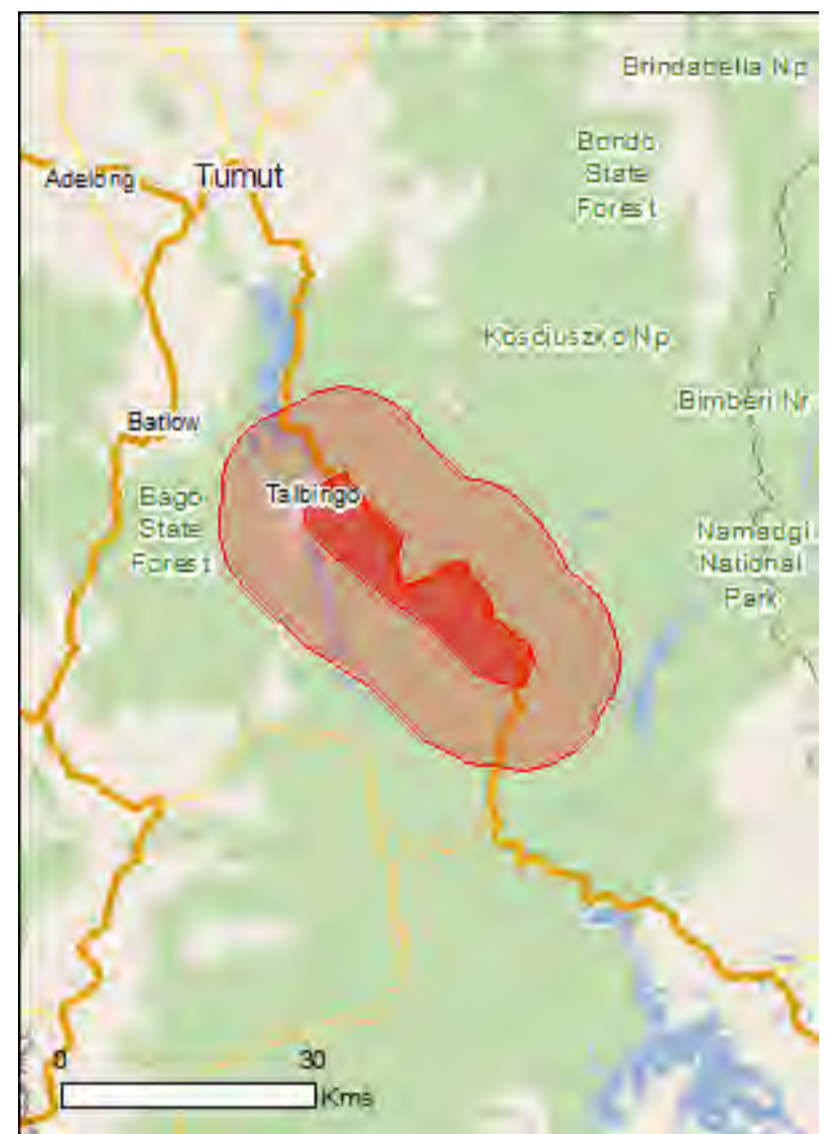
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

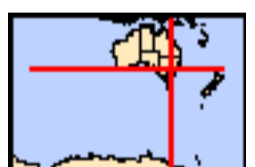
[Acknowledgements](#)



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[Coordinates](#)

[Buffer: 10.0Km](#)



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	2
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	44
Listed Migratory Species:	12

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	18
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	2
Regional Forest Agreements:	1
Invasive Species:	32
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties		[Resource Information]
Name	State	Status
Natural		
Australian Alps National Parks and Reserves	NSW	Listed place
Historic		
Snowy Mountains Scheme	NSW	Listed place

Wetlands of International Importance (Ramsar)		[Resource Information]
Name	Proximity	
Banrock station wetland complex	700 - 800km upstream	
Hattah-kulkyne lakes	500 - 600km upstream	
Riverland	600 - 700km upstream	
The coorong, and lakes alexandrina and albert wetland	700 - 800km upstream	

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community known to occur within area
Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community may occur within area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Fish		
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Macquaria australasica Macquarie Perch [66632]	Endangered	Translocated population known to occur within area
Frogs		
Crinia sloanei Sloane's Froglet [59151]	Endangered	Species or species habitat may occur within area
Litoria booroolongensis Booroolong Frog [1844]	Endangered	Species or species habitat known to occur within area
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area
Litoria spenceri Spotted Tree Frog [25959]	Endangered	Species or species habitat may occur within area
Litoria verreauxii alpina Alpine Tree Frog, Verreaux's Alpine Tree Frog [66669]	Vulnerable	Species or species habitat likely to occur within area
Pseudophryne pengilleyi Northern Corroboree Frog [66670]	Critically Endangered	Species or species habitat known to occur within area
Mammals		
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Vulnerable	Species or species habitat known to occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or

Name	Status	Type of Presence related behaviour likely to occur within area
Plants		
Ammobium craspedioides Yass Daisy [20758]	Vulnerable	Species or species habitat may occur within area
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area
Calotis glandulosa Mauve Burr-daisy [7842]	Vulnerable	Species or species habitat known to occur within area
Colobanthus curtisiae Curtis' Colobanth [23961]	Vulnerable	Species or species habitat likely to occur within area
Diuris ochroma Pale Golden Moths [64565]	Vulnerable	Species or species habitat may occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat likely to occur within area
Pomaderris cotoneaster Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat may occur within area
Prasophyllum bagoense Bago Leek-orchid [84276]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum innubum Brandy Marys Leek-orchid [83603]	Critically Endangered	Species or species habitat likely to occur within area
Prasophyllum keltonii Kelton's Leek-orchid [83604]	Critically Endangered	Species or species habitat likely to occur within area
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area
Pterostylis oreophila Blue-tongued Orchid, Kiandra Greenhood [22903]	Critically Endangered	Species or species habitat known to occur within area
Rutidosis leiolepis Monaro Golden Daisy [21490]	Vulnerable	Species or species habitat known to occur within area
Swainsona recta Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		

Name	Status	Type of Presence
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area
Cyclodomorphus praealtus Alpine She-oak Skink [64721]	Endangered	Species or species habitat may occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
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Migratory Marine Birds

Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
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Migratory Terrestrial Species

Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
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Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area
--	--	--

Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
---	--	--

Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
--	--	---

Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
---	--	---

Migratory Wetlands Species

Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
--	--	--

Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
--	--	--

Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
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Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
--	--	--

Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
--	--	--

Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
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Other Matters Protected by the EPBC Act

Commonwealth Land

[\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name

Commonwealth Land - Telstra Corporation Limited

Listed Marine Species

[\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Kosciuszko	NSW
Tumut Subregion of Southern Region	NSW

Regional Forest Agreements	[Resource Information]
Note that all areas with completed RFAs have been included.	
Name	State
Southern RFA	New South Wales

Invasive Species	[Resource Information]
Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.	

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-35.580631 148.292399,-35.562759 148.334972,-35.581469 148.348189,-35.616364 148.396426,-35.640502 148.38956,-35.658078 148.395225,-35.659333 148.403979,-35.658217 148.410674,-35.65473 148.425952,-35.647477 148.431617,-35.64106 148.447581,-35.642037 148.461658,-35.649569 148.467666,-35.664633 148.482085,-35.67565 148.491183,-35.687223 148.491183,-35.713988 148.532039,-35.726114 148.537532,-35.747572 148.523627,-35.744646 148.495132,-35.735729 148.472301,-35.693776 148.419429,-35.651662 148.342525,-35.628364 148.312484,-35.609665 148.290855,-35.609735 148.290597,-35.580631 148.292399

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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Attachment 2

Example Construction Method

Talbingo and Yarrangobilly Mountain Bike Trail Network





Construction Methodology

Below is a list of the steps required to satisfy planning requirements and construction methods to complete the project.

Initial Design & Planning

- Initial site visit & consultation with project stakeholders
- On ground assessment of site
- Preparation of draft design quotation for comment
- Review of comments and preparation of final design and construction quotation.

Pre- Start Design & planning

- Installation of sediment control measures if required.
- Implementation of procedures as outlined in WHS Management Plan.
- Site induction of all project involved principal personnel and contractor staff.
- Marking of track alignment on ground.
- Locate any buried services where identified by 'Dial Before you Dig' search.

Trail construction

The following is a list of the common types of methods used in in the construction of mountain bike trails. The methods are designed to meet both the IMBA (International Mountain Biking Association) and MTBA (Mountain Bike Australia) guidelines for sustainable trail construction. These are designed to ensure trails are built to meet the highest standard for sustainability, erosion control, low maintenance, and ride quality.



Survey Trail

This method is used primarily in areas where the natural terrain is more suitable for trail use as is. It is the lowest cost and easiest form of trail construction. The most important element is ensuring the designed alignment meets sustainable guidelines.



'Bunty's Trail' – Mill Creek area, Jindabyne NSW

Installation of new trail alignments via.

- Marking of trail alignment to IMBA / MTBA standards for rolling contour trail.
- Chainsaw clearing / pruning of 2m trail corridor and ceiling, and hand removal of debris.
- Hand raking / brush cutting and mowing / spraying of min 600mm wide trail tread to expose soil.
- Hand tool shaping where required, to establish drainage / grade reversals and trail features.
- Mechanical compaction where required to stabilise soil.



Excavated Trail / Rock Outcrops / Berms

This method is used where the natural terrain is not as suitable (e.g. steeper side slope, rock outcrops) and requires more significant shaping to create a suitable trail surface.



'Mill Creek Trail' – Lake Jindabyne Shared Trail Network, Jindabyne

NSW

Installation of new trail via.

- Erection of barrier fencing and / or construction signage at all entry's to trail.
- Marking of trail alignment to IMBA / MTBA standards for rolling contour trail.
- Chainsaw clearing / pruning of 2m wide trail corridor / ceiling.
- Excavation of 0.8-1.5m wide trail tread and backslope using 1.5ton excavator.
- Excavation of drainage, grade reversals and trail feature where required using 1.5 ton excavator.
- Hand finishing and mechanical compaction of new trail tread.
- Revegetation of disturbed areas around trail tread with thatch sourced on site.



Watercourse rock armouring

Used in gully crossings, wet areas or where additional armouring of trail tread is required. Designed to elevate trail tread above surrounding area, while letting water run through or over trail in times of high-water flow. Generally cheaper option than platform structures.



'Thredbo Valley Trail' - Kosciusko National Park, NSW

Installed by.

- Erection of barrier fencing and / or construction signage at all entry's to trail.
- Hand and/or machine excavation of tread where required as per above.
- Source large local rock on site and import to area.
- Install rock flagging as minimum 600mm wide trail tread to existing ground level.
- Import from outside source <40mm rock / crushed material, spread over large rock, and mechanically compact tread (This last step only applies if smooth / consistent tread surface is required).



Raised Platforms

Used in wet areas, gully crossings or areas where other methods not suitable (e.g. very steep slopes). Platforms with a fall zone to the side higher than 900mm will generally require the addition of a handrail





Bridges

Larger structures usually designed to span river or other large obstacles. Due to the unique requirements of each bridge (i.e. span, height, foundations), they will require individual design and engineering to suit site.



Attachment 3

Example Environmental Management Plan

Talbingo and Yarrangobilly Mountain Bike Trail Network



Environmental Management Plan (EMP) – Blue Lake and Main Range Walk

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
1. CONSERVATION OF PLANTS & WILDLIFE				
1.1 Protect flora and fauna	Protect existing grasses and plants at and around the Site from damage unless approved by the Principal	daily	Andrew Downing / Craig Stonestreet	
	Do not remove grasses and plants without approval from the Principal	daily	Andrew Downing / Craig Stonestreet	
	Control weeds on the Site	daily	Andrew Downing / Craig Stonestreet	
	Protect birds, fish and animals at and around the Site from harm	daily	Andrew Downing / Craig Stonestreet	
	Do not remove birds, fish and animals from the Site without the written agreement of the Principal	Daily	Andrew Downing / Craig Stonestreet	
	Do not bring birds, fish, animals and plants onto the Site without written agreement from the Principal	Daily	Andrew Downing / Craig Stonestreet	
	Minimise the use of pesticides and herbicides for minimal impact on the environment	N/A		

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
1.2 Control movement of pedestrians, materials, vehicles and plant to minimise damage to the environment	Use only designated routes for access to the Site, and movements at the site.	Daily	Andrew Downing / Craig Stonestreet	
	Use designated trail corridor only for storage and movement of materials around site	Daily	Andrew Downing / Craig Stonestreet	
	Locate compounds, and park all vehicles and plant, in designated areas on the Site	Daily	Andrew Downing / Craig Stonestreet	
	Install appropriate barriers / signage to control pedestrian movement through site	Daily	Andrew Downing / Craig Stonestreet	
2. CONSERVATION OF RESOURCES				
2.1 Design for energy efficiency	Adopt energy efficiency, environmental enhancement and waste minimisation as design criteria	Daily	Andrew Downing / Craig Stonestreet	
	Schedule works to minimise movement of plant / labour and materials around site	Daily	Andrew Downing / Craig Stonestreet	
2.2 Select materials to minimise: – resource use and waste	Reuse all disturbed sods / topsoil on the Site	Daily	Andrew Downing / Craig Stonestreet	

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
<ul style="list-style-type: none"> - ozone depleting effects - detrimental effects on air, water, and land quality <p>2.3 Conserve heritage items and other physical attributes of the Site</p>	Mulch and chip cleared vegetation as appropriate	N/A		
	Use of materials that are recycled from Snowy Hydro tunnel spoil or from existing trail corridor	Daily	Andrew Downing / Craig Stonestreet	
	Use timber from sustainable managed sources only	N/A		
	Implement a strategy to reduce the quantity of waste, including minimising and recycling packaging	Daily	Andrew Downing / Craig Stonestreet	
	Use low water demand fittings & appliances (dual flush toilets, water conserving shower roses & taps)	N/A		
	Minimise the use of solvents, glues, paints and other materials which release odours or vapour	N/A		
	Comply with statutory requirements for conservation of heritage items			
	Manage the conservation of physical attributes of the Site, including: <ol style="list-style-type: none"> 1. Sensitive Alpine habitat 2. Protected species 	Daily	Andrew Downing / Craig Stonestreet	
3. POLLUTION CONTROL				
3.1 Control discharges and emissions from vehicles and plant to minimise damage to the environment	Do not use vehicles, plant or equipment that produce excessive emissions, and monitor emissions during works	Daily	Andrew Downing / Craig Stonestreet	
	Bunt around machinery when not in use	Daily	Andrew Downing / Craig Stonestreet	

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
	Do not bring vehicles or plant and equipment with hydraulic fluid, fuel or oil leaks to the Site	Daily	Andrew Downing / Craig Stonestreet	
	Wash down vehicles, plant and equipment on entry and exit in specified wash down area acceptable to the Principal	Daily	Andrew Downing / Craig Stonestreet	
	Carry spill kit. Prevent and clean up any spills from transport vehicles	Daily	Andrew Downing / Craig Stonestreet	
3.2 Prevent pollution of stormwater and adverse effects on land and vegetation by control of cleaning activities and discharges	All cleaning to be carried out where possible off site	Daily	Andrew Downing / Craig Stonestreet	
	Control all run-off from cleaning activities	Daily	Andrew Downing / Craig Stonestreet	
	Discharge only non-toxic cleaning products generally	N/A		
3.3 Control soil erosion	Identify the existing drainage paths on the Site and protect them against siltation	Daily	Andrew Downing / Craig Stonestreet	

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
	Protect vulnerable and exposed surfaces and stockpiles against scouring	Daily	Andrew Downing / Craig Stonestreet	
	Install the following sediment control devices before starting construction: 1. Rice straw bales wrapped in geotextile fabric at stockpile sites 2. Coir logs and / or rice straw bales along track edges where required	Daily	Andrew Downing / Craig Stonestreet	
	Monitor and manage the effectiveness of sediment control devices	Daily	Andrew Downing / Craig Stonestreet	
	Remove sediment control devices when no longer required	As applicable	Andrew Downing / Craig Stonestreet	
3.4 Prevent release of soil contamination to the environment	Establish, before starting work on the Site, in consultation with the Principal, if contaminated soil is present at the Site	As applicable	Andrew Downing / Craig Stonestreet	
	If contaminated soil is present, manage the work to prevent release to the environment	As applicable	Andrew Downing / Craig Stonestreet	
3.5 Manage refrigerants and other dangerous goods to meet statutory requirements	Ensure the procedures used for the charging and disposal of refrigerants and use of dangerous goods meet statutory obligations	N/A		
	Use appropriately trained employees	N/A		
	Obtain the licences required	N/A		

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
	Document dangerous goods identification, disposal and management, and retain the documentation	N/A		
3.6 Minimise noise and vibration impacts on neighbours, occupants and users of any facility	Comply with noise limits and conditions prescribed by the EPA, Office of Environment and Heritage and Council (as applicable)	Daily	Andrew Downing / Craig Stonestreet	
	Use equipment in good repair and condition	Daily	Andrew Downing / Craig Stonestreet	
	Use noise suppression equipment (e.g. silencers on compressors) and acoustic barriers as required	Daily	Andrew Downing / Craig Stonestreet	
	Do not expose workers, neighbours or visitors to excessive noise, and cooperate and coordinate with operators of any neighbouring facility	Daily	Andrew Downing / Craig Stonestreet	
	Do not expose people or property to excessive vibrations	Daily	Andrew Downing / Craig Stonestreet	
3.7 Comply with Trade Waste Licence conditions applicable to the facility	Implement procedures to avoid breaches of the Trade Waste Licence conditions (may apply to discharges from cooling water systems, condenser water systems, heating water systems, cooking facilities, engine discharges, water treated with chemicals or where large sediment loads exist)	N/A		

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
3.8 Minimise air pollution from dust and emissions	Minimise areas of exposed earth and stockpiles	Daily	Andrew Downing / Craig Stonestreet	
	Cover and secure materials in open transport	Daily	Andrew Downing / Craig Stonestreet	
	Use water sprays and/or other means to control dust	Daily	Andrew Downing / Craig Stonestreet	
	Keep emissions within statutory or other required limits	Daily	Andrew Downing / Craig Stonestreet	
	Minimise fire risks, and prevent and control fires	Daily	Andrew Downing / Craig Stonestreet	
3.9 Dispose of waste in accordance with statutory requirements	Implement appropriate disposal procedures for all waste items, including using lawful places for disposal, recording and reporting on the method and location of disposal and any non-conformances	Daily	Andrew Downing / Craig Stonestreet	
	Provide valid disposal certificates for each applicable item	As applicable	Andrew Downing / Craig Stonestreet	

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
	<ol style="list-style-type: none"> 1. Packaging materials 2. Replaced or redundant materials 3. Chemicals 4. Oils and greases from machinery, cooking and other processes 5. Paints and solvents, including those used to clean equipment, tools and brushes 6. Cleaning materials and rags 7. Materials unsuitable for re-use, including hazardous materials such as asbestos 	Daily	Andrew Downing / Craig Stonestreet	
3.10 Minimise damage to the environment from emergencies	Document emergency procedures to manage all reasonably foreseeable harm, including spills and other environmental emergencies	Prior to start	Andrew Downing / Craig Stonestreet	
	Ensure emergency procedures are followed	As applicable	Andrew Downing / Craig Stonestreet	
	Obtain the agreement of the Principal to procedures for handling oil, chemicals and other dangerous goods before placing them on the Site, including secure storage arrangements	Prior to start	Andrew Downing / Craig Stonestreet	
	Re-instate and clean damaged areas and features, including work areas	As applicable	Andrew Downing / Craig Stonestreet	
	Re-instate damaged eco-systems and features to their previous condition	As applicable	Andrew Downing / Craig Stonestreet	

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
	Identify key contacts: (LIST NAMES and ROLES) 1. Chris Darlington – NPWS Project manager 2. Tim Greville – NPWS Ranger 3. Andrew Downing – Contractor Principal 4. Craig Stonestreet – Contractor site supervisor			
3.11 Comply with environmental requirements and rectify breaches	Inspect the Site daily to ensure appropriate environmental controls are in place and operating effectively, and that all environmental management requirements are being met	Daily	Andrew Downing / Craig Stonestreet	
	Cooperate with environmental audits by others	As applicable	Andrew Downing / Craig Stonestreet	
	Rectify any environmental breaches identified within the time specified in an audit or by the Principal	As applicable	Andrew Downing / Craig Stonestreet	
4. RECORDS AND REPORTING				
4.1 Provide sufficient documentation to demonstrate appropriate environmental management, including:	Prepare, submit and update the Environmental Management Plan	Prior to start	Andrew Downing / Craig Stonestreet	
	Maintain and submit records of environmental training	As applicable	Andrew Downing / Craig Stonestreet	

ENVIRONMENTAL OBJECTIVES	ACTION TO BE TAKEN	WHEN ACTION WILL BE TAKEN	PERSON RESPONSIBLE	ACTION COMPLETED
	Report on implementation of the Environmental Management Plan	As applicable	Andrew Downing / Craig Stonestreet	
	Submit applicable waste disposal certificates and/or company certification of appropriate disposal	As applicable	Andrew Downing / Craig Stonestreet	
	Submit to the Principal copies of correspondence with regulators, including incident reports and notification of non-compliances or fines	As applicable	Andrew Downing / Craig Stonestreet	
	Submit documentation evidencing that the causes of non-compliances have been corrected	As applicable	Andrew Downing / Craig Stonestreet	
	Keep records for inspection securely filed using an effective document retrieval system	As applicable	Andrew Downing / Craig Stonestreet	
4.2 Report environmental incidents	Immediately report all environmental incidents to the Principal	As applicable	Andrew Downing / Craig Stonestreet	
	Immediately report environmental incidents as otherwise required	As applicable	Andrew Downing / Craig Stonestreet	

Attachment 4

Sustainability Assessment Talbingo and Yarrangobilly Mountain Bike Trail Network



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1. Document description

This sustainability assessment for built facilities and structures is based on the template for Template for new built facilities and structures, and adaptations, alterations and modifications to existing facilities, requiring a lease or licence under s.151 of the *National Parks and Wildlife Act 1974* (NPW Act) or for proposals of a similar kind being undertaken by the Department of Environment, Climate Change and Water (DECCW).

The sustainability assessment for built facilities and structures will be submitted with a completed Review of Environmental Factors (REF) for activities under Part 5 of the *EP&A Act 1979*.

This part of the assessment considers the sustainability issues associated with building facilities and structures and including modifications to existing places.

The approach in the following assessment is consistent with the intent of the *NSW Government Sustainability Policy* and DECCW's *Sustainability Action Plan* and demonstrates how a project will contribute to the achievement of park management objectives, including those related to conservation and public use and enjoyment.

2. Introduction

Talbingo and Yarrangobilly are located within a region with high tourist visitation near and in Kosciuszko National Park (KNP). Jindabyne to the south and Canberra to the east are both recognised as mountain bike tourism destinations.

A Concept Plan has identified that there is a significant opportunity to develop the area surrounding Talbingo, including Yarrangobilly, Pinbeyan, and Bogong Peak Wilderness within KNP, into a mountain bike tourism destination with the development and installation of a mountain bike trail network, thereby providing additional new business opportunities and increasing the economic benefits to existing businesses.

Additionally, the recent evolution of electric mountain bikes (eMTB's) has opened opportunities to develop longer and more challenging trail networks that, while still suitable for normal mountain bikes, will be more accessible and provide a unique user experience for eMTB riders.

Infrastructure associated with the mountain bike trail network is likely to include:

- picnic tables and chairs;
- small shelters;
- trail racks;
- water points;
- carparks;
- toilets; and
- solar charging stations.

For locations of the proposed structures within the park, see REF Figure 1 and Section 4 for photographs of the proposed structures.

3. Proposed location

The proposed MTB network will be in the Snowy Valleys Shire area of Kosciuszko National Park in the suburbs of Talbingo, Yarrangobilly, Pinbeyan, Bogong Peak Wilderness. The areas are commonly known as Big Talbingo Mountain, Old Talbingo Mountain, Landers Link, Yarrangobilly.

For the proposed alignment and geographic coordinates see the REF Figure 1 and Section 6, respectively.

4. Scale and mass

Well-designed built facilities and structures will reflect a scale that is appropriate to the park setting and responds to the landscape context. Facilities should be unobtrusive and not dominate the locality, either in their physical presence or usage.

Factors: *Height and siting*
Separation and setbacks
Density and footprint

Documentation: *Provide information addressing the sustainability assessment criteria for the above factors, including:*

- *a written statement of the design rationale*
- *a site analysis*
- *relevant plans, elevations, sections and shadow diagrams.*

The design has taken into consideration areas of Aboriginal, Cultural, Heritage, National, International, and ecological significance and the proposed alignment does not impact any known sensitive areas. The REF provides a site analysis based on the environmental impacts and this sustainability assessment identifies the sustainability of the construction, maintenance, materials, and design of the proposed MTB network.

The MTB network design will be based heavily on the Thredbo and Jindabyne mountain bike trails. The construction methodology for the Thredbo to Jindabyne trail are attached to the REF for the proposed MTB network for reference. The trails themselves will be no wider than 2 m and will utilise pre-existing fire trails where feasible.

Proposed additional carparks for the MTB network are presented in REF Figure XX and will utilise areas that are already disturbed to limit unnecessary clearing.

Structures included in the proposed MTB network are limited to:

- Picnic tables and chairs;
- Small shelters;
- Trail racks;
- 5 Solar charging stations;



- 2 bridges (similar to Thredbo valley Track design);



- Approximately 507 m of raised platforms (with or without handrails);



- 1 viewing platform (similar to Landers Falls Lookout); and



- signage (major and minor / wayfinding).



Should it be required for safety, two underpasses will also be installed along the alignment in the pre-disturbed area under the Snowy Mountains Highway similar to those in the following photograph.



5. Design and appearance

The design and external appearance of facilities will play a major part in determining how well they blend into the park setting. The choice of materials can also greatly influence the achievement of this outcome.

Every park will have a different context, setting and unique combination of values. The type of building design that works in an alpine setting, for example, will likely not be applicable to a rainforest.

Each proposal must therefore be assessed on its own merits and design qualities.

Factor: <i>Form and style</i>
<i>Documentation: Provide information addressing the sustainability assessment criteria, either below or in the statement of design rationale. Also provide details of proposed materials and colours.</i>
<p>The proposed MTB network structures will be consistent with current NPWS practices:</p> <ul style="list-style-type: none"> - Bridges / raised platforms will be constructed using raw steel for framework. Steel mesh decking is recommended (in place of current FRP use) purely for additional fire resistance. All surfaces will age to a rusted colour finish. - Seating /shelters etc will be steel also for fire resistance - Signage will be metal posts and sign material / design consistent with NPWS guidelines. - Solar charging points could be incorporated into major trailhead sign (as per dropbox photo) - Carparks will be informal hard-stands and use burnt logs (trees felled for safety purposes during track construction) to define area. - Toilets will be stand alone, long drop style unit (as per Kiandra courthouse). - Underpasses will be will be concrete culverts wide enough for 2 bikes to pass for the as long as the width of the Snowy Mountains Highway at Crossing 1 and Crossing 2, if required.
Factor: <i>Orientation, solar access and ventilation</i>
<i>Documentation: Provide information addressing the sustainability assessment criteria, either below or in the statement of design rationale and site analysis plan. Also provide details of design features to address control of daylight, shading and glare.</i>
<p>Seating, shelters, and solar charging stations will be located in areas where it does not obstruct drainage but that is off the main trails so as not to impact other MTB network users.</p> <p>Structures, where appropriate, will be oriented to obtain as much natural light as feasible.</p>
Factor: <i>Amenity</i>
<i>Documentation: Provide information addressing the sustainability assessment criteria.</i>
<ul style="list-style-type: none"> - Proposed carparks and the trailhead will be in pre-disturbed areas adjacent to the Snowy Mountains Highway that do not impact significant vantage points. - Toilet facilities are proposed at crossing 3 (see REF Figure 1) adjacent to Snowy Mountains Highway in locations that do not impact significant view points. - Seating / shelters located at prominent view locations or major nodes along trail. <p>The proposed amenities associated with the MTB network will be primarily to accommodate MTB network users, however, given the proximity to the Snowy Mountains Highway a wider range of the community will have access to them. This may encourage the travellers to stop increasing safety for road users, and explore the area.</p>

6. Resource use, energy, materials and waste

Every building and facility involves a complex combination of many natural and processed materials. Well-designed facilities that are designed for long life, durability and adaptability will generally make the most efficient use of natural resources, energy and water throughout their full life cycle. They will also minimise the production and release into the environment of waste products, and maximise opportunities for recycling.

Achieving outcomes in these areas is driven by the imperatives of climate change and the long-term goal of carbon neutrality. There is also an opportunity for on-park facilities to showcase best practice. This is consistent with the commitment in the NSW *Government Sustainability Policy* that Government will lead by example.

Factor: <i>Materials choice and embodied energy</i>
<i>Documentation: Provide information addressing the sustainability assessment criteria, including analysis and justification of materials selection.</i>
<p>The proposed MTB network will use of raw metal for bridges, raised platforms, benches, and shelters for the following reasons:</p> <ul style="list-style-type: none"> - Fire resistance. - Flat rust colour blends with surround and reduces glare. - Materials can be either pre-fabricated or bundled and flown in for onsite fabrication depending on site specific requirements. - Useful lifespan of material. - Easily modified to suit conditions. - Nil painting and minimal ongoing maintenance. - Concrete for the underpass if required. <p>Materials and labour will be sourced locally where reasonable and feasible.</p>
Factor: <i>Energy use</i>
<i>Documentation: Provide information addressing the sustainability assessment criteria, focusing on measures to first avoid and then minimise energy use. Where rating schemes can be used to evaluate a building's energy performance also include details of the scheme and rating achieved.</i>
<p>Energy use will be relatively high during construction of the proposed MTB network however minimal plant will be utilised and rehabilitation will be undertaken on a progressive basis so there will be an approximate track length of 200 m worked on at a time. This will minimise plant required. eMTB bikes will be used as primary transport for trail crews to / from job site and Snowy Mountains Highway to limit vehicles on the tracks.</p> <p>Energy use will be reasonably high during the construction of the bridges and platforms regardless of materials used. Use of metal will reduce energy use over long term compared to other materials (particularly in bushfire prone region).</p> <p>Energy use during operation of the MTB network will be minimal with the solar charging stations and toilets using solely renewable solar power.</p>
Factor: <i>Water use</i>
<i>Documentation: Provide information addressing the sustainability assessment criteria, focusing on measures to first avoid and then minimise water use. Where rating schemes can be used to evaluate a building's water use performance also include details of the scheme and rating achieved.</i>
<p>The toilets will be non-flush drop unit to minimise water use.</p> <p>Taps for handwashing will be auto shut off to minimise water usage.</p>

Water catchment from roof space and containment in small water tank for hand washing (as per Kiandra Courthouse toilets).
Factor: <i>Miscellaneous materials</i>
<i>Documentation: Provide information addressing the sustainability assessment criteria.</i>
Vegetation and soil will be reused on site.
Trees that pose a safety hazard as a result of the 2020 bushfires will be felled and used to delineate trails or carparks.
Factor: <i>Waste management and recycling</i>
<i>Documentation: Provide information addressing the sustainability assessment criteria, focusing first on measures to avoid waste and then to reuse or recycle.</i>
Waste or weeds removed during construction requiring disposal will be managed as per current NPWS guidelines. A weed management program along the MTB alignment could be implemented during construction to assist in weed management.
Vegetation removed during clearing will be reused in the rehabilitation of the areas required during the construction of the MTB network but not required for the operation of the network.
Soil and sediment will not be removed from site but will be reused for track stability.
Rock required from armouring will be brought in with appropriate material classifications and will come from sources within the park, such as, the underpass if the material is suitable, stockpiled materials from Snowy Hydro, or from the Snowy 2.0 project, where feasible. The rock used will be confirmed for suitability including chemically inert and physically suitable

7. Optimising existing building or place performance (including heritage buildings)

Existing buildings and structures have an immediate sustainability advantage compared to new facilities, in that they represent a significant stock of embodied energy. Retention and reuse conserves that resource and avoids the outlay of energy to develop new buildings. Many traditional building materials, such as timber, concrete and brick, are known to have better embodied energy ratings than more modern materials such as glass, steel or aluminium.

Existing buildings and places, especially those of heritage value, also have very different design and functional characteristics than more contemporary buildings (which have moisture barriers, damp-proof courses, membranes, cavity walls and insulation). Proposals involving existing facilities provide an important opportunity to undertake essential repairs and sympathetic upgrades to improve (and in some cases restore) building performance. This will also assist in both protecting the significance of heritage places and enhancing asset longevity.

Factors: <i>Thermal mass</i> <i>Controlling moisture</i> <i>Passive heating and cooling</i> <i>Existing heating systems</i>
<i>Documentation: Provide information addressing the sustainability assessment criteria. In the case of heritage items, this should include demonstration that the heritage significance of the building or structure will be protected.</i>
NA

8. Sustainability during construction and operation

To ensure that proposals are well designed, the use of high quality materials and incorporation of the best resource efficiency techniques is critical. However, even with the best intentions some designs and innovations do not work to their maximum potential when applied in real-life situations. Equally, built facilities need to be maintained to ensure they are kept in good working order.

It is therefore essential to assess and monitor the environmental performance of facilities over time. Key questions include: Was the facility built as planned?; Is it delivering the planned environmental outcomes? (for example energy and water use); and Does it need to be changed or adapted in response to monitoring data or to advances in understanding and technology?

Factor: Sustainability during construction

Documentation: Provide information addressing the sustainability assessment criteria.

Note: Projects involving building or infrastructure works (including temporary structures) will need to demonstrate compliance with relevant construction standards. Refer to the DECCW Construction Assessment Procedures for more guidance.

Bridges and viewing platforms;

- temporary, reusable, scaffolding used in river during construction similarly to the photograph below.



- will be constructed to Australian standards including AS1657 – Fixed Platforms, Walkways, Stairways & Ladders, AS2156 - Walking tracks, infrastructure design, and AS1170 - Structural design actions.

- underpasses, if required, will be constructed to Australian Standards: AS1428.1, and in general accordance with Guide to Road Design Part 6A: Pedestrian and Cyclist Paths (Austroads, 2009)

- Sustainability during operation, ongoing use and deconstruction

Documentation: Provide information addressing the sustainability assessment criteria. For temporary structures outline how the deconstruction phase will occur, including planned reuse or recycling of materials. Where rating schemes can be used to evaluate a building's ongoing environmental performance, include details of the scheme to be used and planned timing of obtaining a rating.

The sustainability of the site during demobilisation of the site from construction to operation includes:

- temporary scaffolding removal on completion of bridge framework and reused on other sites.
- felled hazardous trees used on site for trail and carpark delineation. Should there be surplus trees, they will remain in place as habitat trees.
- vegetation removed during clearing reuse in rehabilitation of areas no longer required for construction purposes – weeds will be removed from site under approved NSW waste management guidelines.
- NPWS approved straw bales will be used in rehabilitation of disturbed areas outside of trail tread.

The operation of the MTB will leave the park in a largely unmodified natural and cultural heritage conditions.

Maintenance is expected to be minimal and be undertaken on an as needed basis and may include:

- removal of trees should they fall and block the track during storms;
- maintenance/repair of the solar charging stations;
- inspection of platforms and structures;
- annual pruning or brush cutting of trail corridor;
- minor reshaping of trail tread (drainage maintenance); and
- longer term possible periodic machine maintenance (5-10 years from construction).

9. Sustainable park management partnerships

The national parks system is managed to deliver both conservation and public enjoyment objectives. Proposals should demonstrate how they can provide not only tourism or visitor experiences, but how they will contribute to management actions that protect and enhance the park values that attract visitors. This is an opportunity to highlight partnership proposals that demonstrate a shared commitment to achieving park management goals.

Examples may include projects that address contributions to biodiversity conservation programs (weed and pest control, ecological restoration), Aboriginal and historic heritage conservation (site protection, building restoration), visitor experiences (interpretive tours, volunteer programs, study tours), visitor management services (marketing, information, signage) and park infrastructure (utilities, roads, trails, lookouts).

Factor: <i>Contribution to park management objectives</i>
<i>Documentation: Provide information addressing the sustainability assessment criteria.</i>
<p>Contributions of the park management objectives include the following:</p> <p>Biodiversity;</p> <ul style="list-style-type: none"> - assists in access to remote areas for weed and pest management. - protects sensitive species and habitat areas through alignment avoidance. <p>Heritage;</p> <ul style="list-style-type: none"> - protects aboriginal sites through alignment avoidance. - provides access to cultural sites such as Yarrangobilly cemetery and Jounama School site

(off Lobs Hole Ravine Road north).

Visitor experience;

- connection between visitor nodes (thermal pools, Yarrangobilly Village, landers Falls, etc).
- new MTB experience in Northern end of park in line with Park POM.

Visitor management;

- improved wayfinding of nodes.
- marketing to new user group for northern end of park.

Park infrastructure;

- additional parking and amenities along Snowy Mountains Highway.
- new lookouts and improved access to existing ones.

10. Proponent sign-off

<i>Signature</i>	
<i>Name</i>	Kylie Bradley
<i>Position</i>	Coordinator Place Activation
<i>Date</i>	

Attachment 5

Threatened Species Assessment of Significance (5 Part Test)

Talbingo and Yarrangobilly Mountain Bike Trail Network



1 Threatened species assessment of significance (5 part test)

Threatened species and ecological communities, or their habitats, which are likely to be affected by the activity are identified and considered herein.

The factors set out in s.5AA EP&A Act are used to decide whether there is likely to be a significant effect on threatened species ecological communities or their habitats. These are known as the threatened species assessment of significance or '5 part test', and are set out below.

Threatened species and communities and critical habitats listed under both the *Biodiversity Conservation Act 2016* and *Fisheries Management Act 1994* are included. Those **only** listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) are **not** included.

The 5-part test (s.5AA Environmental Planning and Assessment Act)

- (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
- (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:
 - (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
 - (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction
- (c) in relation to the habitat of a threatened species or ecological community:
 - (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
 - (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and
 - (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality
- (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).
- (e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Table 1 Threatened Species Observed in the Proposed Activity Area and Habitat Requirements.

Scientific Name	Common Name	NSW Status	Commonwealth Status	Habitat Requirements
AMPHIBIANS				
<i>Pseudophryne pengilleyi</i>	Northern Corroboree Frog	E4A, P, 2	CE	Resides in forests, sub-alpine woodlands and tall heath with extensive sphagnum bogs in the Brindabella Ranges and the Fiery Range. Summer breeding habitat includes pools and seepages in sphagnum bogs, wet heath, wet tussock grasslands and herb fields in low-lying depressions. In winter they can generally be found under litter, logs and dense groundcover.
<i>Litoria booroolongensis</i>	Booroolong Frog	E1, P	E	Sightings limited to NSW and north-eastern VIC, predominantly along the western-flowing streams of the Great Dividing Range with the most recent observations on the south-west slopes of NSW. Resides generally in upland rivers, montane creeks and lowland rivers and creeks, particularly in permanent rocky western-flowing streams and rivers on the slopes and tablelands of NSW, with some fringing vegetation cover such as ferns, sedges or grasses. Often observed in daylight on rocks by the water's edge or sheltering under rocks or amongst vegetation. Breeding occurs in spring and early summer when eggs are laid in submerged rock crevices. Tadpoles develop in slow-flowing connected or isolated pools and metamorphose in late summer to early autumn.
REPTILES				
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V, P		Resides in heath, open forest and woodland breeding in termite mounds. Shelters in hollow logs, rock crevices and in burrows of their own or other species', such as rabbit warrens. Requires large areas for habitat and feeds on carrion, birds, eggs, reptiles and small mammals.
BIRDS				
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V, P		A migratory species generally sedentary in Australia, though immature individuals and some adults are dispersive. Recorded in terrestrial and coastal wetlands; favouring deep freshwater swamps, lakes and reservoirs; shallow coastal lagoons and saltmarshes. Hunts over open terrestrial

				habitats and feeds on birds, reptiles, fish, mammals, crustaceans and carrion. Roosts and makes nest in trees.
<i>Hieraetus morphnoides</i>	Little Eagle	V, P		Prevalent in lightly timbered areas with open areas providing an abundance of prey species. Often been recorded foraging in grasslands, crops, treeless dune fields, and recently logged areas. Nests in tall living trees within farmland, woodland and forests.
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V, P, 03		Generally, resides in tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests in summer but has been sighted in subalpine Snow Gum woodland and occasionally in temperate or regenerating forest. In winter, resides at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. Requires tree hollows in which to breed.
<i>Ninox strenua</i>	Powerful Owl	V, P, 3		Resides in wet and dry eucalypt forests and rainforests potentially in both un-logged and lightly logged forests as well as undisturbed forests where it usually roosts on the limbs of dense trees in gully areas. Nesting occurs in large mature trees with a diameter at breast height of at least 100 cm and hollows at least 0.5 m deep and a large proportion of the diet is made up of hollow-dependent arboreal marsupials. Habitat range can be between 450 and 1,450 ha.
<i>Tyto novaehollandiae</i>	Masked Owl	V, P, 3		Resides throughout NSW roosting and nesting in heavy forest and hunts in open woodland and farmland with a home range of 500-100 ha. Requires tall trees with suitable large hollows for nesting and roosting and adjacent areas for foraging. Feeds on small mammals.
<i>Tyto tenebricosa</i>	Sooty Owl	V, P, 3		Sighted in tall old-growth forests, including temperate and subtropical rainforests but commonly found on escarpments with a mean altitude <500 m. Nests and roosts in hollows of emergent trees, mainly eucalypts often in gullies.
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	V, P		Resides in eucalypt woodlands with areas of relatively flat open woodland lacking a dense shrub layer, with short grass or bare ground and with fallen logs or dead trees present.

<i>Daphoenositta chrysoptera</i>	Varied Sittella	V, P		Resides in eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and <i>Acacia</i> woodland. Nests a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years. Feeds on arthropods from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.
<i>Pachycephala olivacea</i>	Olive Whistler	V, P		Resides in wet forests on the ranges of the east coast but has also been sighted a range of habitats including alpine thickets, wetter rainforest/woodlands, riparian vegetation and heaths.
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V, P		Generally resides in dry, open eucalypt forests and woodlands, with open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. Also sighted in shrublands, heathlands, very occasionally in moist forest or rainforest, and farmland, usually at the edges of forest or woodland.
<i>Petroica boodang</i>	Scarlet Robin	V, P		Resides in dry eucalypt forests and woodlands with open, grassy understorey with few scattered shrubs moving to more open and cleared areas during autumn and winter. Feeds on insects from amongst logs and woody debris. Nests in an open cup of plant fibres and cobwebs, sited in forks of trees.
<i>Petroica phoenicea</i>	Flame Robin	V, P		Resides in a broad coastal band from southern Queensland to just west of the South Australian border. Preferred habitat in summer includes moist eucalyptus forests and open woodlands, and open woodlands and farmlands in winter. Considered migratory. Feeds mainly on invertebrates.
<i>Gallinago hardwickii</i>	Latham's Snipe	P	J, K	A non-breeding migrant to the south east of Australia including Tasmania, passing through the north and New Guinea on passage. Latham's Snipe breed in Japan and on the east Asian mainland. Generally observed in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover, including vegetation around wetlands, grasses, lignum, reeds and rushes and creek edges on migration. They also use crops and pasture.
Mammals				

<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V, P	E	Resides along the east coast of Australia and the Great Dividing Range in a range of habitats including sclerophyll forests and woodlands, coastal heathlands and rainforests. Occasional sightings in open country, grazing lands, rocky outcrops and other treeless areas. Habitat requires den sites including hollow logs, rock crevices and caves, an abundance of food and an area of intact vegetation in which to forage. Feeds on medium-sized mammals, and feeds on invertebrates, reptiles and birds. Requires large areas of relatively intact vegetation through which to forage. Habitat range of a female is between 180 and 1,000 ha, and males is between 2,000 and 5,000 ha. Breeding occurs from May to August.
<i>Phascolarctos cinereus</i>	Koala	V, P	V	Generally resides on the central and north coasts of NSW with some populations in the western region. Feed almost exclusively on eucalypt foliage, including <i>Eucalyptus robusta</i> , <i>E. tereticornis</i> , <i>E. punctata</i> , <i>E. haemostoma</i> and <i>E. signata</i> . Solitary with varying home ranges.
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V, P		Endemic to the snow-covered alpine regions of Victoria and NSW. Largely confined to naturally-occurring boulderfields and rock scree in alpine and subalpine areas at altitudes above 1,400 m. Have been sighted at locations 1,200 m above sea level.
<i>Petaurus australis</i>	Yellow-bellied Glider population on the Bago Plateau	E2, V, P		Reside in dens in small family groups in hollows of large trees on the Bago Plateau consists of tall wet sclerophyll forest dominated by <i>Eucalyptus delegatensis</i> , <i>E. dalrympleana</i> , <i>E. radiata</i> , and <i>E. rubida</i> . Feeds on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Are nocturnal with habitats ranging between 20 to 85 ha to encompass dispersed and seasonally variable food resources.
<i>Mastacomys fuscus</i>	Broad-toothed Rat	V, P	V	Sighted in heath land and woodlands of the Snowy Mountains with optimum habitat, close to streams and steep banks that are densely covered in vegetation. Construct grass nest and runaways under logs and dense undergrowth.
<i>Pseudomys fumeus</i>	Smoky Mouse	E4A, P	E	Resides on ridgetops and slopes within sclerophyll forests, heathland, and open forest from the coast to sub-alpine regions of up to 1,800 m. Feeds on legumes, invertebrates, fungi, flowers and seeds. Nests in burrows tree roots and under the skirts of Grass Trees.

<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V, P		Generally resides in caves but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. The rest of the year, populations disperse within about 300 km range of maternity caves. With cold caves in southern Australia used for hibernation. Hunt in forested areas and feed on moths and other flying insects above the tree tops.
FISH				
<i>Macquaria australasica</i>	Macquarie Perch		E	Reside in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury and Shoalhaven catchments. Macquarie perch are found in both river and lake habitats, including the upper reaches of rivers and their tributaries.
<i>Euastacus armatus</i>	Murry Crayfish		E	Reside in the Murray River upstream of Mildura, in the Murrumbidgee River and in some dams, and are the only species in the Euastacus genus that live in both cold and warm water habitats.
PLANTS				
<i>Carex raleighii</i>	Raleigh Sedge	E1		Observed at elevations above 1000m. Grows primarily in sphagnum bogs and high mountain wetlands and less commonly in swampy grassland and along stream edges of sub-alpine plains.
<i>Euphrasia scabra</i>	Rough Eyebright	E1, 3		Grows along the margins of swampy grassland and sphagnum bogs in a variety of communities including Montane Bogs and Fens, Temperate Montane Grasslands, Subalpine Woodlands, and Tableland Clay Grassy Woodlands. Grows in wet, peaty soils.
<i>Discaria nitida</i>	Leafy Anchor Plant	V		Erect deciduous shrub grows in rocky situations, along stream banks and on rocky areas near small waterfalls in sand or gravel and occasionally on limestone. Observed predominantly in Kosciuszko National Park above altitudes of 900 m in a variety of communities including Alpine Bogs and Fens, Eastern Riverine Forests, Temperate Montane Grasslands, and Subalpine Woodlands.
<i>Thesium australe</i>	Austral Toadflax	V	V	Small, straggling herb with a scattered distribution along the coast of eastern NSW including the Northern and Southern Tablelands, Tasmania,

				Queensland and eastern Asia. Observed growing on damp sites in grassland, grassy woodlands and coastal headlands often in association with Kangaroo Grass <i>Themeda triandra</i> in a variety of communities including New England Dry Sclerophyll Forests, Western Slopes Grasslands, Northern Tableland Wet Sclerophyll Forests, Brigalow Clay Plain Woodlands, Subalpine Woodlands and Maritime Grasslands.
<i>Coolac-Tumut Serpentine Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions</i>	Coolac-Tumut Serpentine Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	E3		<p>Consists of overstorey with drooping she-oak and shrubs including hickory wattle, and grasstrees. The ground layer consists of a range of native grasses and herbs, including kangaroo grass, wiregrasses, wallaby grasses, and rock fern. Scattered white box and bundy can occur.</p> <p>Many sites are degraded and have a poor level of regeneration, therefore no longer supporting the full population of species. They are restricted to soils derived from serpentinite in the Tumut-Coolac-Gundagai area. The largest occurrence is on the Honeysuckle range to the east of Tumut which extends from Argalong to the Murrumbidgee River. Smaller areas occur near Coolac and Gundagai.</p>
<i>Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions</i>	Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	E3	E	<p>Montane Peatlands and Swamps comprises a dense, open or sparse layer of shrubs with soft-leaved sedges, grasses and forbs. It is the only type of wetland that may contain more than trace amounts of <i>Sphagnum</i> spp., the hummock peat-forming mosses. Small trees may be present as scattered emergent or absent.</p> <p>The community typically has an open to very sparse layer of shrubs, 1-5 m tall though in peatlands and swamps with a history of grazing by domestic livestock, the shrub layer may be very sparse or absent.</p> <p>Montane Peatlands typically have a dense groundcover of sedges, grasses and forbs, except where a dense cover of tall shrubs casts deep shade. Soft-leaved species of typically make up most of the groundcover with <i>Sphagnum</i> moss.</p>
<i>Windswept Feldmark in the Australian Alps Bioregion</i>	Windswept Feldmark in the Australian Alps Bioregion	E4B		<p>Windswept Feldmark occurs on high ridges of the Kosciuszko Main Range from 2010–2150 m above sea level and is restricted to the Main Range. The shallow soils and strong winds in this environment result in vegetation cover in Windswept Feldmark being relatively sparse with low plant diversity. The dominant shrub (<i>Epacris microphylla</i>) which grows in discrete 'halo-like' patches typically less than 1 m² in area accounting for 25–50% cover of this community is thought to be important in facilitating regeneration and growth of several species restricted to this community,</p>

				which include <i>Euphrasia collina</i> subsp. <i>lapidosa</i> , <i>Kelleria dieffenbachia</i> , <i>Luzula australasica</i> subsp. <i>dura</i> , <i>Ranunculus acrophilus</i> , <i>Rytidosperma pumilum</i> and <i>Veronica densifolia</i> .
<i>White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions</i>	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	E4B	CE	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions (commonly referred to as Box-Gum Woodland) was listed as a Critically Endangered Ecological Community (CEEC) on July 17, 2020. It is an open woodland community, sometimes occurring as a forest formation, where the most obvious species are one or more of White Box, Yellow Box, and Blakely's Red Gum. Sites contain a high diversity of plant species, including the main tree species, additional tree species, some shrub species, several climbing plant species, many grasses and a very high diversity of herbs. The community also includes a range of mammal, bird, reptile, frog and invertebrate fauna species. Intact stands that contain diverse upper and mid-storeys and ground layers are rare.

Notes:

- NSW Status This code identifies the Legal Status of the species within NSW under the Biodiversity Conservation Act 2016 No. 63 (BC Act 2016), the Fisheries Management Act 1994 No. 38 (FM Act 1994) and the Sensitive Species Data Policy (SSDP).

Code Description Definition under the BC Act 2016 No. 63, the FM Act 1994 No. 38, or the SSDP.

P Protected Refers to species listed in Schedules 5 and 6 of the BC Act 2016.

V Vulnerable Refers to fauna and flora species that are likely to become endangered unless the circumstances & factors threatening its survival or evolutionary development cease to operate (Schedule 1, part 3, BC Act 2016).

E1 Endangered Refers to fauna and flora species that are likely to become extinct in nature in NSW unless the circumstances and factors threatening its survival or evolutionary developments cease to operate; or, its numbers have been reduced to such a critical level, or its habitats have been so drastically reduced, that it is in immediate danger of extinction; or, it might already be extinct, but it is not presumed extinct (Schedule 1, part 2, BC Act 2016).

E2 Endangered Population Refers to a population where, in the opinion of the Scientific Committee, its numbers have been reduced to such a critical level, or its habitat has been so drastically reduced, that it is in immediate danger of extinction and it is not a population of a species already listed in Schedule 1, and: (a) it is disjunct and at or near the limit of its geographic range, or (b) it is or is likely to be genetically distinct, or (c) it is otherwise of significant conservation value (Schedule 1, part 2, BC Act 2016).

E4A Critically Endangered Species Refers to a species that is eligible to be listed as a critically endangered species if, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future, as determined in accordance with criteria prescribed by the regulations (Schedule 1, part 1, BC Act 2016).

- Commonwealth status This code identifies the Legal Status of the species under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act), and Migratory Bird agreements (JAMBA, CAMBA and ROKAMBA).

Code Description Definition under the EPBC Act 1999, and Migratory Birds agreement.

CE Critically Endangered Refers to a native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria (Subdivision A of Division 1 of Part 13, Commonwealth EPBC Act 1999).

E Endangered Refers to a native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria (Subdivision A of Division 2 of Part 13, Commonwealth EPBC Act 1999).

J JAMBA Japan-Australia Migratory Bird Agreement:

Refers to species listed in the Bilateral Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (Subdivision A of Division 1 of Part 5, Commonwealth EPBC Act 1999).

K ROKAMBA Republic of Korea-Australia Migratory Bird Agreement:

Refers to species listed in the Bilateral Agreement between the Government of Australia and the Government of the Republic of Korea for the protection of Migratory Birds and their Environment (Subdivision A of Division 1 of Part 5, Commonwealth EPBC Act 1999).

V Vulnerable Refers to a native species is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria (Subdivision A of Division 1 of Part 13, Commonwealth EPBC Act 1999).

Northern Corroboree Frog



(NSW OEH)

Assessment of Significance		Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>		<p>Last spotted in 2013 within 2 km from the proposed MTB network but the proposed MTB network includes areas along the Yarrangobilly River, creeks, and other habitat for breeding and feeding though the impact to these areas will be minimal with 507 m of raised platform and 57 m of rock armouring to protect these areas.</p> <p>No water will be diverted during the construction or operation of the MTB network and the armouring could provide additional habitat areas.</p> <p>It is unlikely the works would pose a risk to the lifecycle of the frogs.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p>	<p>Not applicable.</p>
	<p>- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>	<p>Not applicable.</p>
<p>In relation to the habitat of a threatened species or ecological community:</p>	<p>- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</p>	<p>507 m of raised platform and 57 m of rock armouring over the 82 km of network are proposed.</p> <p>No water will be diverted during the construction or operation of the MTB network and the armouring could provide additional habitat areas</p>

	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The proposed 507 m of raised platform and 57 m of rock armouring have been designed to mitigate fragmentation or isolation of habitat.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	The potential impact to the habitat with the proposed 507 m of raised platform and 57 m of rock armouring is minimal in. The proposed works are unlikely to result in detrimental impacts to the survival of the frogs.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Weed invasion of streamside habitats, particularly by willows. • Disease - infection by the amphibian chytrid fungus, which causes the disease chytridiomycosis. • Damage to breeding sites during forestry operations. <p>No frogs have been observed in the area of the proposed MTB network and the proposed 507 m of raised platform and 57 m of rock armouring have been designed to mitigate impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p>
Conclusion		The potential impacts of the proposed MTB on the frogs are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.

Booroolong Frog



(NSW OEH)

Assessment of Significance		Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>		<p>The proposed MTB network includes areas along the Yarrangobilly River, creeks, and other suitable rocky habitat for breeding and feeding though the impact to these areas will be minimal with 507 m of raised platform and 57 m of rock armouring to protect these areas.</p> <p>No water will be diverted during the construction or operation of the MTB network and the armouring could provide additional habitat areas.</p> <p>It is unlikely the works would pose a risk to the lifecycle of the frogs.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p>	<p>Not applicable.</p>
	<p>- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>	<p>Not applicable.</p>
<p>In relation to the habitat of a threatened species or ecological community:</p>	<p>- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</p>	<p>507 m of raised platform and 57 m of rock armouring over the 82 km of network are proposed.</p> <p>No water will be diverted during the construction or operation of the MTB network and the armouring could provide additional habitat areas</p>

	<p>- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and</p>	<p>The proposed 507 m of raised platform and 57 m of rock armouring have been designed to mitigate fragmentation or isolation of habitat.</p>
	<p>- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality</p>	<p>The potential impact to the habitat with the proposed 507 m of raised platform and 57 m of rock armouring is minimal in. The proposed works are unlikely to result in detrimental impacts to the survival of the frogs.</p>
<p>Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).</p>	<p>Not applicable.</p>	
<p>Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.</p>	<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> • Modification of stream channels and loss of cobble banks. • Loss of native streamside vegetation. <p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Weed invasion of streamside habitats, particularly by willows. • Disease - chytrid fungus. <p>The proposed MTB network will modify the stream and river areas but will provide additional potential habitat areas.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p>	
<p>Conclusion</p>	<p>The potential impacts of the proposed MTB on the frogs are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.</p>	

Rosenberg's Goanna



(NSW OEH)

Assessment of Significance		Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>		<p>The Rosenberg's Goanna was last spotted in 2016. The proposed MTB network area is likely to contain foraging habitat and potentially breeding grounds. Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the surround environment is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p>	<p>Not applicable.</p>
	<p>- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>	<p>Not applicable.</p>
<p>In relation to the habitat of a threatened species or ecological community:</p>	<p>- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</p>	<p>Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if the pose a risk to safety and will be use to delineate the trails so will still be able to be utilised as habitat trees.</p>

	<p>- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and</p>	<p>The area has been disturbed previously and is part of an extensive potential habitat for goannas. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation or isolation of habitat areas.</p>
	<p>- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality</p>	<p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in detrimental impacts to the survival of the goanna.</p>
<p>Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).</p>	<p>Not applicable.</p>	
<p>Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.</p>	<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> • Habitat loss and fragmentation as land is cleared for residential, agricultural and industrial developments. • Removal of habitat elements, such as termite mounds and fallen timber. <p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees being felled and those that are felled will not be removed from the area. This will result in a loss of ground litter from compaction but an increase of understory habitat. The construction methodology and network design will minimise the duration and extent of the impacts.</p>	
<p>Conclusion</p>	<p>The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.</p>	

White-bellied Sea-Eagle



(birdlife.org.au)

Assessment of Significance		Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.		<p>The proposed MTB network is unlikely to impact feeding habitat for the eagles. The breeding habitat for the eagles tends to be closer to lakes in tall trees. The observed Sea Eagles are recorded at Talbingo reservoir approximately 2.5 km from the proposed MTB network.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the surround environment is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	Habitat for these eagles will not be removed or modified during the construction or operation of the proposed MTB network, unless the trees pose a hazard to safety.

	<p>- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and</p>	<p>Given the migratory nature of these eagles and the extent of the area they occupy their habitat is unlikely to be fragmented or isolated during the construction or operation of the proposed MTB network.</p>
	<p>- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality</p>	<p>It is unlikely that habitat will be removed, modified, fragmented, or isolated during the construction or operation of the proposed MTB network, unless the trees pose a hazard to safety. Therefore, the proposed works are unlikely to result in detrimental impacts to the survival of the eagles.</p>
<p>Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).</p>	<p>Not applicable.</p>	
<p>Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.</p>	<p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Land clearing reduces the amount of suitable habitat available and this can force birds to nest in sub-optimal habitats where their breeding success is greatly reduced. • The White-bellied Sea-eagle is sensitive to disturbance when nesting, especially during the early stages of the breeding season, and may desert nests and young if confronted by humans or exposed to human activity. • Off-road vehicles accessing remote coastal areas, and various forms of recreation (e.g. surfing, bushwalking, rock-climbing, fishing, hunting and intrusive photography), have each been implicated in the abandonment of White-bellied Sea-Eagle nest sites. <p>However, the closest recorded sighting is 2.5km from the proposed MTB network and the potential impact to the habitat by the proposed MTB network is minimal in comparison to the extensive habitat of the surrounding environment.</p>	
<p>Conclusion</p>	<p>The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.</p>	

Little Eagle



(NSW OEH)

Assessment of Significance		Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>		<p>The proposed MTB network area is likely to contain foraging habitat and breeding grounds. Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if they pose a risk to safety and will be used to delineate the trails so will still be able to be utilised as habitat trees.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the birds have been observed is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p>	<p>Not applicable.</p>
	<p>- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>	<p>Not applicable.</p>

In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if the pose a risk to safety and will be use to delineate the trails so will still be able to be utilised as habitat trees.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area has been disturbed previously and is part of an extensive habitat for woodland birds. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in detrimental impacts to the survival of the birds.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Clearing of habitat for development. <p>However, with the significant impact in the area it is unlikely that the clearing of the clearing of the 16.5 ha of the proposed MTB network will impact the extensive habitat of the surround environment.</p> <p>The construction methodology and network design will minimise the duration and extent of the impacts.</p>
Conclusion		The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.

Gang-gang Cockatoo



(NSW OEH)

Assessment of Significance		Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>		<p>Nesting and breeding habitats include eucalypt forests in tree hollows. Breeding is irregular throughout the year with the young taking 9 months to be independent.</p> <p>The proposed MTB network area is unlikely to impact habitat and breeding grounds. Although the overall area of the network is approximately 16.5 ha, this landscape has significantly impacted by the 2020 bushfires. It is also noted that trees will only be felled if the pose a risk to safety and will be use to delineate the trails. If the tree requires felling it is unlikely to still be of use to this bird.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the birds have been observed is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community,</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p>	<p>Not applicable.</p>

whether the proposed development or activity:	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The potential impact to the habitat by the proposed MTB network is minimal in comparison to the extensive habitat of the surrounding environment.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area has been significantly damaged by fire and is part of an extensive habitat for birds. The potential impact to the habitat by the proposed MTB network is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation or isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Approximately 16.5 ha of ground surface and litter will be cleared. This is not used for breeding or foraging. Few trees will be felled and if they are, they will no longer be suitable for breeding or nesting habitat. The potential impact to the habitat is minimal. The proposed works are unlikely to result in detrimental impacts to the survival of the birds.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> • Clearing of habitat for grazing, agriculture, forestry or other development. <p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Competition from invasive weeds. <p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. This will result in a loss of ground litter from compaction and a loss of understory habitat. The construction methodology and network design will minimise the duration and extent of the impacts.</p>



	The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.
Conclusion	The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.

Powerful Owl



(NSW OEH)

Assessment of Significance	Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	<p>Nesting habitat includes eucalypt forests in unlogged and unburnt gullies and lower slopes close to streams in large tree hollows. Breeding is irregular throughout the year with the young taking 9 months to be independent.</p> <p>The proposed MTB network area is unlikely to impact habitat and breeding grounds. Although the overall area of the network is approximately 16.5 ha, this landscape has significantly impacted by the 2020 bushfires. It is also noted that trees will only be felled if the pose a</p>



		<p>risk to safety and will be use to delineate the trails. If the tree requires felling it is unlikely to still be of use to this bird.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the birds have been observed is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The proposed MTB network would not impact large trees used for breeding and foraging small animals.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area has been significantly damaged by fire and is part of an extensive habitat for birds. The potential impact to the habitat by the proposed MTB network is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Approximately 16.5 ha of ground surface and litter will be cleared. This is not used for breeding or foraging. Few trees will be felled and if they are, they will no longer be suitable breed or nesting habitat. The potential impact to the habitat is minimal in. The proposed works are unlikely to result in detrimental impacts to the survival of the birds.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Clearing of habitat for grazing, agriculture, forestry or other development.



	<ul style="list-style-type: none"> • Can be extremely sensitive to disturbance around the nest site, particularly during pre-laying, laying and downy chick stages. Disturbance during the breeding period may affect breeding success. <p>However, with the significant impact in the area it is unlikely that the clearing of the 16.5 ha of the proposed MTB network will impact the extensive habitat of the surround environment. The construction methodology and network design will minimise the duration and extent of the impacts.</p>
Conclusion	<p>The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.</p>

Masked Owl



(NSW OEH)

Assessment of Significance	Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>	<p>Nesting habitat includes eucalypt forests in unlogged and unburnt gullies and lower slopes close to streams in large tree hollows. Breeding is irregular throughout the year with the young taking 9 months to be independent.</p>

		<p>The proposed MTB network area is unlikely to impact habitat and breeding grounds. Although the overall area of the network is approximately 16.5 ha, this landscape has significantly impacted by the 2020 bushfires. It is also noted that trees will only be felled if the pose a risk to safety and will be use to delineate the trails. If the tree requires felling it is unlikely to still be of use to this bird.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the birds have been observed is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The proposed MTB network would not impact large trees used for breeding and foraging small animals.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area has been significantly damaged by fire and is part of an extensive habitat for birds. The potential impact to the habitat by the proposed MTB network is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Approximately 16.5 ha of ground surface and litter will be cleared. This is not used for breeding or foraging. Few trees will be felled and if they are, they will no longer be suitable breed or nesting habitat. The potential impact to the habitat is minimal in. The proposed works are unlikely to result in detrimental impacts to the survival of the birds.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.



<p>Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.</p>	<p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Clearing of habitat for grazing, agriculture, forestry or other development. <p>However, with the significant impact in the area it is unlikely that the clearing of the 16.5 ha of the proposed MTB network will impact the extensive habitat of the surround environment.</p> <p>The construction methodology and network design will minimise the duration and extent of the impacts.</p>
<p>Conclusion</p>	<p>The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.</p>

Sooty Owl



(NSW OEH)

<p>Assessment of Significance</p>	<p>Response</p>
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>	<p>Nesting habitat includes eucalypt forests in unlogged and unburnt gullies and lower slopes close to streams in large tree hollows. Breeding is</p>



		<p>irregular throughout the year with the young taking 9 months to be independent.</p> <p>The proposed MTB network area is unlikely to impact habitat and breeding grounds. Although the overall area of the network is approximately 16.5 ha, this landscape has significantly impacted by the 2020 bushfires. It is also noted that trees will only be felled if the pose a risk to safety and will be use to delineate the trails. If the tree requires felling it is unlikely to still be of use to this bird.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the birds have been observed is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p>	<p>Not applicable.</p>
	<p>- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>	<p>Not applicable.</p>
<p>In relation to the habitat of a threatened species or ecological community:</p>	<p>- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</p>	<p>The proposed MTB network would not impact large trees used for breeding and foraging small animals.</p>
	<p>- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and</p>	<p>The area has been significantly damaged by fire and is part of an extensive habitat for birds. The potential impact to the habitat by the proposed MTB network is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation of isolation of habitat areas.</p>
	<p>- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality</p>	<p>Approximately 16.5 ha of ground surface and litter will be cleared. This is not used for breeding or foraging. Few trees will be felled and if they are, they will no longer be suitable breed or nesting habitat. The potential impact to the habitat is minimal in. The proposed works are unlikely to result in detrimental impacts to the survival of the birds.</p>



Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	<p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none">• Clearing of habitat for grazing, agriculture, forestry or other development. <p>However, with the significant impact in the area it is unlikely that the clearing of the 16.5 ha of the proposed MTB network will impact the extensive habitat of the surround environment.</p> <p>The construction methodology and network design will minimise the duration and extent of the impacts.</p>
Conclusion	The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.

Brown Treecreeper (eastern subspecies)



(NSW OEH)

Assessment of Significance		Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>		<p>The proposed MTB network area is likely to contain foraging habitat and breeding grounds. Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if they pose a risk to safety and will be used to delineate the trails so will still be able to be utilised as habitat trees.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the birds have been observed is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p>	<p>Not applicable.</p>
	<p>- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>	<p>Not applicable.</p>
<p>In relation to the habitat of a threatened species or ecological community:</p>	<p>- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</p>	<p>Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if the</p>



		pose a risk to safety and will be use to delineate the trails so will still be able to be utilised as habitat trees.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area has been disturbed previously and is part of an extensive habitat for woodland birds. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in detrimental impacts to the survival of the birds.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> • Loss of ground litter from compaction. • Loss of understorey habitat. <p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Competition from invasive weeds. <p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. This will result in a loss of ground littler from compaction and a loss of understorey habitat. The construction methodology and network design will minimise the duration and extent of the impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p>
Conclusion		The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.

Varied Sittella



(birdlife.org.au)

Assessment of Significance		Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.		<p>The proposed MTB network area is likely to contain foraging habitat and breeding grounds. Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if they pose a risk to safety and will be used to delineate the trails so will still be able to be utilised as habitat trees.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the birds have been observed is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if they pose a risk to safety and will be used to delineate the trails so will still be able to be utilised as habitat trees.

	<p>- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and</p>	<p>The area has been disturbed previously and is part of an extensive habitat for woodland birds. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation or isolation of habitat areas.</p>
	<p>- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality</p>	<p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in detrimental impacts to the survival of the birds.</p>
<p>Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).</p>	<p>Not applicable.</p>	
<p>Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.</p>	<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> • Loss of ground litter from compaction. • Loss of understorey habitat. <p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Competition from invasive weeds. <p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. This will result in a loss of ground litter from compaction and a loss of understorey habitat. The construction methodology and network design will minimise the duration and extent of the impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p>	
<p>Conclusion</p>	<p>The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.</p>	

Olive Whistler



(NSW OEH)

Assessment of Significance		Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>		<p>The proposed MTB network area is likely to contain foraging habitat and breeding grounds. Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if they pose a risk to safety and will be used to delineate the trails so will still be able to be utilised as habitat trees.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the birds have been observed is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p>	<p>Not applicable.</p>
	<p>- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>	<p>Not applicable.</p>
<p>In relation to the habitat of a threatened species or ecological community:</p>	<p>- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</p>	<p>Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if the</p>

		pose a risk to safety and will be use to delineate the trails so will still be able to be utilised as habitat trees.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area has been disturbed previously and is part of an extensive habitat for woodland birds. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in detrimental impacts to the survival of the birds.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> Loss of understorey habitat. <p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> Competition from invasive weeds. <p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. This will result in a loss of ground littler from compaction and a loss of understorey habitat. The construction methodology and network design will minimise the duration and extent of the impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p>
Conclusion		The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.

Dusky Woodswallow



(birdlife.org.au)

Assessment of Significance		Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>		<p>The proposed MTB network area is likely to contain foraging habitat and breeding grounds. Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if they pose a risk to safety and will be used to delineate the trails so will still be able to be utilised as habitat trees.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the birds have been observed is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p>	Not applicable.
	<p>- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>	Not applicable.
<p>In relation to the habitat of a threatened species or ecological community:</p>	<p>- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</p>	<p>Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if the</p>

		pose a risk to safety and will be use to delineate the trails so will still be able to be utilised as habitat trees.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area has been disturbed previously and is part of an extensive habitat for woodland birds. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in detrimental impacts to the survival of the birds.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> • Loss of ground litter from compaction. • Loss of understorey habitat. <p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Competition from invasive weeds. <p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. This will result in a loss of ground litter from compaction and a loss of understorey habitat. The construction methodology and network design will minimise the duration and extent of the impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p>
Conclusion		The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.

Scarlet Robin



(NSW OEH)

Assessment of Significance	Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>	<p>The proposed MTB network area is likely to provide winter foraging habitat though the area is unlikely to be used as breeding ground as this has been observed to occur nearer coastal regions. The overall area of the network is approximately 16.5 ha, but much of this landscape is already disturbed. Trees will only be felled if they pose a risk to safety and will be used to delineate the trails so will still be able to be utilised as habitat trees.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the birds have been observed is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p> <p>- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>
<p>In relation to the habitat of a threatened species or ecological community:</p>	<p>- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</p> <p>Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if they pose a risk to safety and will be used to delineate the trails so will still be able to be utilised as habitat trees.</p>

	<p>- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and</p>	<p>The area has been disturbed previously and is part of an extensive habitat for woodland birds. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation or isolation of habitat areas.</p>
	<p>- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality</p>	<p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in detrimental impacts to the survival of the birds.</p>
<p>Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).</p>	<p>Not applicable.</p>	
<p>Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.</p>	<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> • Loss of ground litter from compaction. • Loss of understorey habitat. <p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Competition from invasive weeds. • Habitat for the scarlet robin may become unsuitable if dense regeneration occurs after bushfires or other disturbances. <p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. This will result in a loss of ground litter from compaction and a loss of understorey habitat. The construction methodology and network design will minimise the duration and extent of the impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact. However, the proposed works could support the bird by limiting the dense regeneration after the 2020 bushfires.</p>	
<p>Conclusion</p>	<p>The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the</p>	



	minimal impact of the work in comparison to the extensive habitat of the surrounding environment.
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Flame Robin



(NSW OEH)

Assessment of Significance	Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>	<p>The proposed MTB network area is likely to provide winter foraging habitat though the area is unlikely to be used as breeding ground as this has been observed to occur nearer coastal regions. The overall area of the network is approximately 16.5 ha, but much of this landscape is already disturbed. Trees will only be felled if the pose a risk to safety and will be use to delineate the trails so will still be able to be utilised as habitat trees.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the birds have been observed is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>

In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if the pose a risk to safety and will be use to delineate the trails so will still be able to be utilised as habitat trees.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area has been disturbed previously and is part of an extensive habitat for woodland birds. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in detrimental impacts to the survival of the birds.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> • Clearing and degradation of wintering habitats. • Loss of ground litter from compaction. • Loss of understorey habitat. <p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Competition from invasive weeds.

	<ul style="list-style-type: none"> Habitat for the scarlet robin may become unsuitable if dense regeneration occurs after bushfires or other disturbances. Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. This will result in a loss of ground litter from compaction and a loss of understory habitat. The construction methodology and network design will minimise the duration and extent of the impacts. <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact. However, the proposed works could support the bird by limiting the dense regeneration after the 2020 bushfires.</p>
<p>Conclusion</p>	<p>The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.</p>

Latham’s Snipe



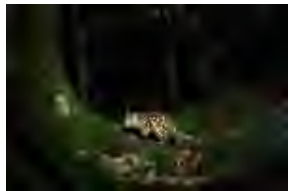
(birdlife.org.au)

Assessment of Significance		Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.		Breeds in Japan and on the East Asian mainland, on dry ground such as grassy hillsides and forest clearings. The proposed MTB network is unlikely to have an adverse effect on the life cycle of this migratory bird.
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The recorded sighting of this bird is over 10 km from the proposed MTB network however there are areas of creeks and rivers that the MTB network will pass through with dense cover though the impact to these areas will be minimal with 507 m of raised platform and 57 m of rock armouring to protect these areas.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	Given the migratory nature of these birds and the extensive habitat of the surrounding environment the habitat is unlikely to become fragmented or isolated.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Given the migratory nature of these birds and the extensive habitat of the surrounding environment the habitat is unlikely the proposed MTB network is unlikely to have an impact on the long-term survival of the birds.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		The proposed activity will directly constitute the following key threatening processes: <ul style="list-style-type: none"> removal feeding habitat. However, the impact will be minor with 507 m of raised platform and 57 m of rock armouring to protect these areas. The impact is anticipated to be minimal.



Conclusion	The potential impacts of the proposed MTB on the bird are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment and their migratory nature.
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Spotted-tailed Quoll



(NSW OEH)

Assessment of Significance		Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.		<p>The proposed MTB network area is likely to provide breeding and foraging habitat. The overall area of the network is approximately 16.5 ha, but much of this landscape is already disturbed. Trees will only be felled if they pose a risk to safety and will be used to delineate the trails so they will still be able to be utilised as habitat trees.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the animals occupy is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.

In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if the pose a risk to safety and will be use to delineate the trails so will still be able to be utilised as habitat trees.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area has been disturbed previously and is part of an extensive habitat. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in detrimental impacts to the survival of the animals.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		The proposed activity will directly constitute the following key threatening processes: <ul style="list-style-type: none"> • loss of habitat. Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area.
Conclusion		The potential impacts of the proposed MTB on the animal are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.

Koala



(NSW OEH)

Assessment of Significance		Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>		<p>Feed almost exclusively on eucalypt foliage, including <i>Eucalyptus robusta</i>, <i>E. tereticornis</i>, <i>E. punctata</i>, <i>E. haemostoma</i> and <i>E. signata</i>. Solitary with varying home ranges.</p> <p>One sighting of a Koala was recorded in Talbingo in 1968.</p> <p>With no established trees being felled for the proposed MTB network unless they pose a risk to safety and the unlikelihood of Koalas in the area it is unlikely the works will impact the lifecycle of Koala.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p>	<p>Not applicable.</p>
	<p>- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>	<p>Not applicable.</p>

In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	No Koala habitat will be removed during construction or operation of the proposed MTB network unless the tree poses a threat to safety. If the tree is unsafe it is unlikely to be a habitat tree.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	As no Koala habitat is likely to be impacted it is unlikely that their habitat will be fragmented or isolated.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	With no habitat impacts, fragmentation, or isolation and with no current evidence of Koalas in the area it is unlikely that the proposed MTB network will pose a threat to the long-term survival of Koalas.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	Not applicable.	
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	It is unlikely that the proposed MTB network will impact any of the key threats to Koalas.	
Conclusion	The potential impacts of the proposed MTB on the animal are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.	

Eastern Pygmy-possum



(NSW OEH)

Assessment of Significance		Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.		<p>There are a number of rocky are noted in the proposed MTB trail alignment however, the animal has only been sighted at Yarrangobilly caves outside of the area of works.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the animals occupy, outside the area of works, is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The anticipated impact to habitat is negligible as it is outside the area of works, however there are rocky areas noted along the 82 km of network. The track will be 2 m wide and will have stabilisation works completed but will not remove any boulder streams.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The maximum width of the track will be 2-m during construction and less during operation. This is unlikely to isolate or fragment habitat.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	The limited impacts to the areas of potential habitat along the MTB network are unlikely to threaten long-term survival of the animal.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> • loss of habitat.



	<ul style="list-style-type: none"> loss of nest sites due to removal of firewood. <p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The felled trees could provide additional habitat for the animals.</p>
Conclusion	<p>The potential impacts of the proposed MTB on the animal are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.</p>

Yellow-bellied Glider population on the Bago Plateau



(NSW OEH)

Assessment of Significance	Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>	<p>The proposed MTB network area is likely to provide breeding and foraging habitat. The overall area of the network is approximately 16.5 ha, but much of this landscape is already disturbed. Trees will only be felled if they pose a risk to safety and will be used to delineate the trails so they will still be able to be utilised as habitat trees.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the animals occupy is negligible. It is unlikely</p>

		that the proposed activity would place the local population at risk of extinction.
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Trees will only be felled if the pose a risk to safety and will be use to delineate the trails so will still be able to be utilised as habitat trees.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area has been disturbed previously and is part of an extensive habitat. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Approximately 16.5 ha of some of which comprises potential foraging habitat, will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in detrimental impacts to the survival of the animals.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> • loss of habitat. • loss of feed trees. <p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The felled trees could provide additional habitat for the animals.</p>



Conclusion	The potential impacts of the proposed MTB on the animal are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.
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Broad-toothed Rat



(NSW OEH)

Assessment of Significance	Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>	<p>The proposed MTB network area is likely to provide breeding and foraging habitat. The overall area of the network is approximately 16.5 ha, but much of this landscape is already disturbed. Trees will only be felled if they pose a risk to safety and will be used to delineate the trails so they will still be able to be utilised as habitat trees.</p> <p>Impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the animals occupy is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>

In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. Additionally, with 507 m of raised platform and 57 m of rock armouring in areas near streams it is unlikely that the habitat will be impacted significantly.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area has been disturbed previously and is part of an extensive habitat. The potential impact to the habitat is minimal in comparison to the habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation or isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Approximately 16.5 ha of some of which comprises potential breeding foraging habitat, will be removed, with few trees suitable for breeding being felled and those that are felled will not be removed from the area. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in detrimental impacts to the survival of the animals.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> • Habitat loss. • Damage from recreational activities <p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Invasion of habitat by exotic weeds including scotch broom, blackberry and willow. <p>Approximately 16.5 ha of potential foraging habitat will be removed, with few trees suitable for breeding being felled and those that are felled will</p>



	<p>not be removed from the area. This will result in a loss of ground litter from compaction and a loss of understory habitat. The construction methodology and network design will minimise the duration and extent of the impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p>
Conclusion	<p>The potential impacts of the proposed MTB on the animal are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.</p>

Smoky Mouse



(NSW OEH)

Assessment of Significance	Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>	<p>One Smoky Mouse was sighted in 1998 at Yarrangobilly Caves with further animals known to reside in Lobs Hole, outside of the proposed MTB network area.</p>



		<p>Populations also naturally experience significant fluctuations in size after bushfires.</p> <p>The proposed MTB network is located in areas breeding and foraging however, impacts to the lifecycle are not anticipated and the extent of the area of impact relative to the area the animals occupy is negligible. It is unlikely that the proposed activity would place the local population at risk of extinction.</p>
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The area has been disturbed previously and is part of an extensive habitat. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in fragmentation or isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Potential foraging and breeding habitat will be cleared. The potential impact to the habitat is minimal in comparison to the extensive habitat of the surrounding environment. The proposed works are unlikely to result in detrimental impacts to the survival of the animals.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity will directly constitute the following key threatening processes:</p> <ul style="list-style-type: none"> Loss of habitat, primarily through timber harvesting and road construction along ridges.



	<p>The proposed activity has the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Dieback caused by cinnamon fungus (<i>Phytophthora cinnamomi</i>) - many of the heath plants in the habitat are highly susceptible. • Loss of site occupancy/low recruitment leading to metapopulation collapse <p>Approximately 16.5 ha of potential foraging and breeding habitat will be removed, though there is limited evidence of their presence in the proposed MTB network area.</p> <p>The construction methodology and network design will minimise the duration and extent of the impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p>
<p>Conclusion</p>	<p>The potential impacts of the proposed MTB on the animal are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.</p>

Large Bent-winged Bat



(NSW OEH)

Assessment of Significance	Response	
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	The proposed MTB network is not likely to impact breeding or feeding habitat of these animals.	
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	No areas of potential habitat will be removed or modified during the proposed MTB network.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	Not applicable.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Not applicable.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	Not applicable.	
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	It is unlikely that the proposed MTB network will impact any of the key threats.	
Conclusion	The potential impacts of the proposed MTB on the animal are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.	

Macquarie Perch



(DPI – Fisheries)

Assessment of Significance		Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.		Reside in the Yarrangobilly River. Two bridges are proposed to span the Yarrangobilly River so it is unlikely that the habitat will be impacted.
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	No areas of potential habitat will be removed during the proposed MTB network. Two bridges will be installed with appropriate environmental measures in place to minimise turbidity during installation.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	Not applicable.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	No impacts to long-term survival are likely.

Threatened Species Assessment of Significance

Talbingo and Yarrangobilly Mountain Bike Trail Network

2/12/2020



Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	It is unlikely that the proposed MTB network will impact any of the key threats.
Conclusion	The potential impacts of the proposed MTB on the animal are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.

Murry Crayfish



(DPI – Fisheries)

Assessment of Significance		Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.		Known to reside in Talbingo Reservoir and tributaries to the reservoir the Murry Crayfish prefers sheltered rocky areas. Two bridges are proposed to span the Yarrangobilly River, with 507 m of raised platform and 57 m of rock armouring in areas near streams it is unlikely that the habitat will be impacted significantly.
In the case of an endangered ecological community or critically endangered ecological community,	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.

whether the proposed development or activity:	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The extent of impacted habitat is likely to be limited to 57 m of rock armouring in areas near streams. No rocks will be placed directly on any animals and the armouring could provide additional habitat for. Therefore, it is unlikely that the habitat will be significantly impacted.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	Areas of rock armouring will be minor in nature and are not anticipated to fragment or isolate habitats.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Significant impacts to habitat are not anticipated and rock armouring could provide additional habitat. The proposed works will unlikely have adverse impacts to long-term survival of the animal.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		It is unlikely that the proposed MTB network will impact any of the key threats.
Conclusion		The potential impacts of the proposed MTB on the animal are not likely to be significant on the population or their habitat given the minimal impact of the work in comparison to the extensive habitat of the surrounding environment.

Raleigh Sedge



(NSW OEH)

Assessment of Significance		Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>		<p>Generally observed at elevations above 1000 m in sphagnum bogs and high mountain wetlands and less commonly in swampy grassland and along stream edges of sub-alpine plains.</p> <p>Has been observed downstream of the Talbingo Dam wall which is outside of the area of impact of the proposed MTB network. It is unlikely to occur along the alignment which is montane forest and therefore the proposed works are unlikely to pose a risk of extinction on the plant.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p>	<p>Not applicable.</p>
	<p>- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>	<p>Not applicable.</p>
<p>In relation to the habitat of a threatened species or ecological community:</p>	<p>- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</p>	<p>The observed plant is outside of the area of impact of the proposed MTB network and is unlikely to be impacted.</p>

	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	Not applicable.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	The observed plant is outside of the area of impact of the proposed MTB network and is unlikely to cause long-term survival risks.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		It is unlikely that the proposed MTB network will impact any of the key threats.
Conclusion		The potential impacts of the proposed MTB on the plant are not likely to be significant on the population or their habitat given the minimal impact of the work in regard to the location and preferred habitat of the plant.

Rough Eyebright



(NSW OEH)

Assessment of Significance		Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.		Is generally located along the margins of swampy grassland and sphagnum bogs in a variety of communities including Montane Bogs and Fens, Temperate Montane Grasslands, Subalpine Woodlands. and Tableland Clay Grassy Woodlands. Grows in wet, peaty soils. Has been recorded outside the area of the proposed MTB network near Yarrangobilly Caves and therefore the proposed works are unlikely to pose a risk of extinction on the plant.
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The observed plant is outside of the area of impact of the proposed MTB network but the alignment has the potential to impact wet peaty soils. However, the proposed 507 m of raised platform and 57 m of rock armouring in areas wet areas will be used to mitigate impacts in these areas.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The proposed 507 m of raised platform and 57 m of rock armouring in areas wet areas will minimise and mitigate the impacts of fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.	With the proposed platforms and armouring, the recorded location of the known plant, and the extent of impacts predicted from the proposed MTB network works adverse impacts to the long-term survival of this plant are unlikely.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.



<p>Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.</p>	<p>The proposed activity will have the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Changes to swamp hydrology and vegetation. • Blackberry and potentially <i>Holcus lanatus</i> exclude <i>E. scabra</i> from suitable habitat. <p>The construction methodology and network design will minimise the extent of the impacts. The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p>
<p>Conclusion</p>	<p>The potential impacts of the proposed MTB on the plant are not likely to be significant on the population or their habitat given the minimal impact of the work in regard to the location and preferred habitat of the plant.</p>

Leafy Anchor Plant



(NSW OEH)

Assessment of Significance		Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.		<p>Generally, grows in rocky situations, including along stream banks and on rocky areas near small waterfalls in sand or gravel and occasionally on limestone. Observed predominantly in Kosciuszko National Park above altitudes of 900 m in a variety of communities including Alpine Bogs and Fens, Eastern Riverine Forests, Temperate Montane Grasslands, and Subalpine Woodlands.</p> <p>Records of observations near the area of the proposed MTB network are near the Yarrangobilly River and the Snowy Mountains Hwy but in areas likely to be protected by raised platforms and therefore the proposed works are unlikely to pose a risk of extinction on the plant.</p>
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The observed plant is outside of the area of impact of the proposed MTB network but the alignment has the potential to impact wet peaty soils. However, the proposed 507 m of raised platform and 57 m of rock armouring in areas wet areas will be used to mitigate impacts in these areas.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The proposed 507 m of raised platform and 57 m of rock armouring in areas wet areas will minimise and mitigate the impacts of fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	With the proposed platforms and armouring, the recorded location of the known plant, and the extent of impacts predicted from the proposed MTB network works adverse impacts to the long-term survival of this plant are unlikely.



Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	<p>The proposed activity will have the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Competition from weeds (especially woody weeds such as blackberry, briar rose and willows). • Clearing of potential habitat. <p>The construction methodology and network design will minimise the extent of the impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p>
Conclusion	The potential impacts of the proposed MTB on the plant are not likely to be significant on the population or their habitat given the minimal impact of the work in regard to the location and preferred habitat of the plant.

Austral Toadflax



(NSW OEH)

Assessment of Significance		Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.		Generally grows in damp sites in grassland, grassy woodlands and coastal headlands often in association with Kangaroo Grass Themeda triandra in a variety of communities including New England Dry Sclerophyll Forests, Western Slopes Grasslands, Northern Tableland Wet Sclerophyll Forests, Brigalow Clay Plain Woodlands, Subalpine Woodlands and Maritime Grasslands. Observed at multiple locations at Yarrangobilly Caves but not along the proposed MTB network alignment.
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The observed plant is outside of the area of impact of the proposed MTB network but the alignment has the potential to impact wet peaty soils. However, the proposed 507 m of raised platform and 57 m of rock armouring in areas wet areas will be used to mitigate impacts in these areas.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The proposed 507 m of raised platform and 57 m of rock armouring in areas wet areas will minimise and mitigate the impacts of fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	With the proposed platforms and armouring, the recorded location of the known plant, and the extent of impacts predicted from the proposed MTB network works adverse impacts to the long-term survival of this plant are unlikely.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.

<p>Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.</p>	<p>The proposed activity will have the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Competition from weeds. • Clearing of potential habitat. <p>The construction methodology and network design will minimise the extent of the impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p>
<p>Conclusion</p>	<p>The potential impacts of the proposed MTB on the plant are not likely to be significant on the population or their habitat given the minimal impact of the work in regard to the location and preferred habitat of the plant.</p>

Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions

Assessment of Significance		Response
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>		<p>Not applicable.</p>
<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p>	<p>- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p>	<p>Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed with as much pre-existing fire trail to be used along the alignment as possible. The potential impact to the ecological community is minimal in comparison to the extensive habitat of the surrounding environment with established areas of growth protected by avoidance. The community is unlikely to be at risk of extinction from the proposed MTB network.</p>
	<p>- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>	<p>The modification of the land proposed is minimal in comparison to the extensive habitat of the surrounding environment with established areas of growth protected by avoidance. The community is unlikely to be at risk of extinction from the proposed MTB network.</p>

In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The extent of impacted habitat is approximately 16.5 ha, much of this landscape is already disturbed with as much pre-existing fire trail to be used along the alignment as possible.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	No fragmentation or isolation of the community is likely for the proposed MTB trail that may pass through areas of concern.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Significant impacts to habitat are not anticipated and with the potential for attention and education of the sensitive ecological community being brought to the community along the trail. The proposed works will unlikely have adverse impacts to long-term survival of the community.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.		<p>The proposed activity will have the potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Competition from weeds. • Clearing of potential habitat. <p>The construction methodology and network design will minimise the extent of the impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p> <p>Educational information could be included to the trail signage to inform the community of the sensitive nature and the significance of the areas they are able to enjoy.</p>
Conclusion		The potential impacts of the proposed MTB on the ecological community are not likely to be significant on the population or their habitat given the minimal impact of the work in regard to the location and preferred habitat of the plant.

Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions

Assessment of Significance		Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.		Not applicable.
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	This community is not generally observed along the alignment of the MTB network, however there are areas that are more peatland and swap that will be protected by raised platforms. Therefore, there should be minimal to no risk of extinction to this local community from the proposed MTB network installation or operation.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	This community is not generally observed along the alignment of the MTB network, however there are areas that are more peatland and swap that will be protected by raised platforms. Therefore, there should be minimal to no risk of extinction to this community from the modifications to the area of the proposed MTB network installation or operation.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The observed community is generally outside of the area of impact of the proposed MTB network on the plains but the alignment has the potential to impact wet peaty soils. However, the proposed 507 m of raised platform in wet areas will be used to mitigate impacts in these areas.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	The proposed 507 m of raised platform in wet areas will minimise and mitigate the impacts of fragmentation of isolation of habitat areas.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	With the proposed platforms, the recorded location of the known plant, and the extent of impacts predicted from the proposed MTB network works adverse impacts to the long-term survival of this community are unlikely.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).		Not applicable.



<p>Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.</p>	<p>The proposed activity will have the direct and potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Competition from weeds. • Clearing of land and modification. • Pollution (including herbicide, pesticides, fertilisers) and sedimentation from runoff. • Hydrological change (including erosion and sedimentation) from roadworks, drainage works, and aqueducts. • Recreational activities (including vehicle use, commercial horse-riding, mountain bikes, bushwalking). • Plant and animal pathogens leading to local extinction of susceptible species. <p>The construction methodology and network design will minimise the extent of the impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p> <p>Educational information could be included to the trail signage to inform the community of the sensitive nature and the significance of the areas they are able to enjoy.</p>
<p>Conclusion</p>	<p>The potential impacts of the proposed MTB on the ecological community are not likely to be significant on the population or their habitat given the minimal impact of the work in regard to the location and preferred habitat of the plant.</p>

Windswept Feldmark in the Australian Alps Bioregion

<p>Assessment of Significance</p>	<p>Response</p>
<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</p>	<p>Not applicable.</p>

In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	This community is generally identified at higher elevations and has not been observed along the alignment of the MTB network, therefore there should be no risk of extinction to this community from the proposed MTB network installation or operation.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	This community is generally identified at higher elevations and has not been observed along the alignment of the MTB network, therefore there should be no risk of extinction to this community from the proposed MTB network installation or operation.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The extent of impacted habitat is approximately 16.5 ha, much of this landscape is already disturbed with as much pre-existing fire trail to be used along the alignment as possible.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	No fragmentation or isolation of the community is likely for the proposed MTB trail that may pass through areas of concern.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Significant impacts to habitat are not anticipated and with the potential for attention and education of the sensitive ecological community being brought to the community along the trail. The proposed works will unlikely have adverse impacts to long-term survival of the community.
Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	Not applicable.	
Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	The proposed MTB network is unlikely to have any direct or potential impacts on the key threatening processes.	
Conclusion	The potential impacts of the proposed MTB on the ecological community are not likely to be significant on the population or their habitat given the minimal impact of the work in regard to the location and preferred habitat of the plant.	

White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions

Assessment of Significance		Response
In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.		Not applicable.
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Although the overall area of the network is approximately 16.5 ha, much of this landscape is already disturbed with as much pre-existing fire trail to be used along the alignment as possible. The potential impact to the ecological community is minimal in comparison to the extensive habitat of the surrounding environment with established areas of growth protected by avoidance. The community is unlikely to be at risk of extinction from the proposed MTB network.
	- is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Modification of the land proposed will occur but will be minimal in comparison to the extensive habitat of the surrounding environment with established areas of growth protected by avoidance. The community is unlikely to be at risk of extinction from the proposed MTB network.
In relation to the habitat of a threatened species or ecological community:	- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and	The extent of impacted habitat is approximately 16.5 ha, much of this landscape is already disturbed with as much pre-existing fire trail to be used along the alignment as possible.
	- whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	No fragmentation or isolation of the community is likely for the proposed MTB trail that may pass through areas of concern.
	- the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	Significant impacts to habitat are not anticipated and with the potential for attention and education of the sensitive ecological community being brought to the community along the trail. The proposed works will unlikely have adverse impacts to long-term survival of the community.



<p>Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).</p>	<p>Not applicable.</p>
<p>Whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.</p>	<p>The proposed activity will have the direct and potential to impact the following key threatening processes:</p> <ul style="list-style-type: none"> • Habitat loss, degradation and fragmentation from agricultural, forestry, mining, infrastructure and residential development. • Degradation of remnants by non-native plant species, including noxious weeds, exotic pasture species and environmental weeds, including garden escapes, olives and pines. • Removal of native ground layer in box-gum woodland remnants where trees have been partially or fully removed. • Lack of community knowledge and appreciation of White Box Yellow Box Blakely's Red Gum Woodland and their component threatened species. • Human disturbance by off road vehicles, camping, other recreational activities and dumping. <p>The construction methodology and network design will minimise the extent of the impacts.</p> <p>The work has the potential to introduce invasive weeds though mitigation measure would be put in place to minimise this impact.</p> <p>Educational information could be included to the trail signage to inform the community of the sensitive nature and the significance of the areas they are able to enjoy.</p>
<p>Conclusion</p>	<p>The potential impacts of the proposed MTB on the ecological community are not likely to be significant on the population or their habitat given the minimal impact of the work in regard to the location and preferred habitat of the plant.</p>

Appendix 1:

Atlas of NSW (BioNet) Search Results

Fauna and Flora Coding Sheet for BioNet Atlas reports

The following tables explain the coding used in the results of searches from BioNet Atlas for fauna and flora data. Please note that not all fields may be populated in your data supply. This is dependent on both the information supplied by the observer, as well as your user level.

Field	Description and relevant coding						
Species Code	A unique code attributed to an individual species, genus or family.						
Kingdom	Refers to whether the organism is flora (FL) or fauna (FA).						
Class	Refers to the Class name.						
Family	Refers to the Family name.						
Scientific Name	The internationally recognised Latin name given to an organism, following the International Codes of Botanical and Zoological Nomenclature.						
Exotic	Denoted by * for all non-native species.						
Common Name	Refers to the common name of an organism.						
NSW Status	<p>This code identifies the Legal Status of the species within NSW under the Biodiversity Conservation Act 2016 No. 63 (BC Act 2016), the Fisheries Management Act 1994 No. 38 (FM Act 1994) and the Sensitive Species Data Policy (SSDP).</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Code</th> <th style="text-align: left;">Description</th> <th style="text-align: left;">Definition under the BC Act 2016 No. 63, the FM Act 1994 No. 38, or the SSDP.</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>Protected</td> <td>Refers to species listed in Schedules 5 and 6 of the BC Act 2016.</td> </tr> </tbody> </table>	Code	Description	Definition under the BC Act 2016 No. 63, the FM Act 1994 No. 38, or the SSDP.	P	Protected	Refers to species listed in Schedules 5 and 6 of the BC Act 2016.
Code	Description	Definition under the BC Act 2016 No. 63, the FM Act 1994 No. 38, or the SSDP.					
P	Protected	Refers to species listed in Schedules 5 and 6 of the BC Act 2016.					



	V	Vulnerable	Refers to fauna and flora species that are likely to become endangered unless the circumstances & factors threatening its survival or evolutionary development cease to operate (Schedule 1, part 3, BC Act 2016).
	E1	Endangered	Refers to fauna and flora species that are likely to become extinct in nature in NSW unless the circumstances and factors threatening its survival or evolutionary developments cease to operate; or, its numbers have been reduced to such a critical level, or its habitats have been so drastically reduced, that it is in immediate danger of extinction; or, it might already be extinct, but it is not presumed extinct (Schedule 1, part 2, BC Act 2016).
	E2	Endangered Population	Refers to a population where, in the opinion of the Scientific Committee, its numbers have been reduced to such a critical level, or its habitat has been so drastically reduced, that it is in immediate danger of extinction and it is not a population of a species already listed in Schedule 1, and: (a) it is disjunct and at or near the limit of its geographic range, or (b) it is or is likely to be genetically distinct, or (c) it is otherwise of significant conservation value (Schedule 1, part 2, BC Act 2016).
	E4A	Critically Endangered Species	Refers to a species that is eligible to be listed as a critically endangered species if, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future, as determined in accordance with criteria prescribed by the regulations (Schedule 1, part 1, BC Act 2016).
	2	Category 2 sensitive species	Refers to species for which Atlas sightings' coordinates will be supplied denatured to public web applications and denatured to licensed clients. Such species are classed as highly sensitive, and provision of precise locations would subject the species to high risk from threats such as disturbance and collection.
	3	Category 3 sensitive species	Refers to species for which sightings' coordinates will be supplied denatured to public web applications but supplied 'as-held' to licensed clients. Current denaturing specifications are set out in Appendix 2. Such species are classed as of medium sensitivity, and provision of precise locations would subject the species to medium risk from threats such as collection/deliberate damage. Data are supplied under the conditions of a written data agreement, usually a Data Licence Agreement.
CommStatus	This code identifies the Legal Status of the species under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act), and Migratory Bird agreements (JAMBA, CAMBA and ROKAMBA).		
	Code	Description	Definition under the EPBC Act 1999, and Migratory Birds agreement.
	C	CAMBA	China-Australia Migratory Bird Agreement: Refers to species listed in the Bilateral Agreement between the Government of Australia and the Government of the People's Republic of China for the protection of Migratory Birds and their Environment (Subdivision A of Division 1 of Part 5, Commonwealth EPBC Act 1999).

	CE	Critically Endangered	Refers to a native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria (Subdivision A of Division 1 of Part 13, Commonwealth EPBC Act 1999).
	E	Endangered	Refers to a native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria (Subdivision A of Division 2 of Part 13, Commonwealth EPBC Act 1999).
	J	JAMBA	Japan-Australia Migratory Bird Agreement: Refers to species listed in the Bilateral Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (Subdivision A of Division 1 of Part 5, Commonwealth EPBC Act 1999).
	K	ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement: Refers to species listed in the Bilateral Agreement between the Government of Australia and the Government of the Republic of Korea for the protection of Migratory Birds and their Environment (Subdivision A of Division 1 of Part 5, Commonwealth EPBC Act 1999).
	V	Vulnerable	Refers to a native species is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria (Subdivision A of Division 1 of Part 13, Commonwealth EPBC Act 1999).

Sensitive Species Information

The full Sensitive Species Data policy including the sensitive species listings is located at:

<http://www.environment.nsw.gov.au/policiesandguidelines/SensitiveSpeciesPolicy.htm>

To protect sensitive species, the precise locations and detailed location descriptions, have not been published.

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Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records
Animalia	Amphibia	Myobatrachidae	3131	<i>Crinia parinsignifera</i>		Eastern Sign-bearing Froglet	P		1
Animalia	Amphibia	Myobatrachidae	3134	<i>Crinia signifera</i>		Common Eastern Froglet	P		11
Animalia	Amphibia	Myobatrachidae	3058	<i>Limnodynastes dumerilii</i>		Eastern Banjo Frog	P		5
Animalia	Amphibia	Myobatrachidae	3061	<i>Limnodynastes peronii</i>		Brown-striped Frog	P		1
Animalia	Amphibia	Myobatrachidae	3117	<i>Pseudophryne bibronii</i>		Bibron's Toadlet	P		16
Animalia	Amphibia	Myobatrachidae	3306	<i>Pseudophryne pengilleyi</i>		Northern Corroboree Frog	E4A, P,2	CE	4
Animalia	Amphibia	Hylidae	3168	<i>Litoria booroolongensis</i>		Booroolong Frog	E1, P	E	8
Animalia	Amphibia	Hylidae	3316	<i>Litoria lesueuri</i>		Lesueur's Frog	P		1
Animalia	Amphibia	Hylidae	3204	<i>Litoria peronii</i>		Peron's Tree Frog	P		4
Animalia	Amphibia	Hylidae	3215	<i>Litoria verreauxii</i>		Verreaux's Frog	P		7
Animalia	Reptilia	Scincidae	2464	<i>Acritoscincus platynota</i>		Red-throated Skink	P		1
Animalia	Reptilia	Scincidae	2375	<i>Ctenotus robustus</i>		Robust Ctenotus	P		1
Animalia	Reptilia	Scincidae	2386	<i>Ctenotus taeniolatus</i>		Copper-tailed Skink	P		1
Animalia	Reptilia	Scincidae	2408	<i>Egernia cunninghami</i>		Cunningham's Skink	P		7
Animalia	Reptilia	Scincidae	9073	<i>Egernia sp.</i>		Unidentified Egernia	P		1
Animalia	Reptilia	Scincidae	2214	<i>Eulamprus heatwolei</i>		Yellow-bellied Water-skink	P		2
Animalia	Reptilia	Scincidae	2561	<i>Eulamprus tympanum</i>		Southern Water-skink	P		1

Threatened Species Assessment of Significance

Talbingo and Yarrangobilly Mountain Bike Trail Network

2/12/2020

Animalia	Reptilia	Scincidae	2451	<i>Lampropholis guichenoti</i>	Pale-flecked Garden Sunskink	P	5
Animalia	Reptilia	Scincidae	2430	<i>Liopholis whitii</i>	White's Skink	P	2
Animalia	Reptilia	Scincidae	2459	<i>Pseudemoia entrecasteauxii</i>	Tussock Cool-skink	P	2
Animalia	Reptilia	Scincidae	2541	<i>Pseudemoia spenceri</i>	Trunk-climbing Cool-skink	P	3
Animalia	Reptilia	Scincidae	2578	<i>Tiliqua nigrolutea</i>	Blotched Blue-tongue	P	4
Animalia	Reptilia	Scincidae	2580	<i>Tiliqua scincoides</i>	Eastern Blue-tongue	P	2
Animalia	Reptilia	Agamidae	2194	<i>Amphibolurus muricatus</i>	Jacky Lizard	P	2
Animalia	Reptilia	Agamidae	2252	<i>Intellagama lesueurii</i>	Eastern Water Dragon	P	2
Animalia	Reptilia	Agamidae	5076	<i>Intellagama lesueurii howitti</i>	Gippsland Water Dragon	P	1
Animalia	Reptilia	Agamidae	2182	<i>Rankinia diemensis</i>	Mountain Dragon	P	3
Animalia	Reptilia	Varanidae	2287	<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V, P	1
Animalia	Reptilia	Elapidae	2642	<i>Austrelaps superbus</i>	Lowland Copperhead	P	5
Animalia	Reptilia	Elapidae	2665	<i>Drysdalia coronoides</i>	White-lipped Snake	P	3
Animalia	Reptilia	Elapidae	2681	<i>Notechis scutatus</i>	Tiger Snake	P	3
Animalia	Reptilia	Elapidae	2693	<i>Pseudechis porphyriacus</i>	Red-bellied Black Snake	P	5
Animalia	Reptilia	Elapidae	2699	<i>Pseudonaja textilis</i>	Eastern Brown Snake	P	1
Animalia	Aves	Anatidae	0208	<i>Anas superciliosa</i>	Pacific Black Duck	P	5
Animalia	Aves	Anatidae	0202	<i>Chenonetta jubata</i>	Australian Wood Duck	P	6
Animalia	Aves	Anatidae	0205	<i>Dendrocygna eytoni</i>	Plumed Whistling-Duck	P	1
Animalia	Aves	Columbidae	0044	<i>Leucosarcia melanoleuca</i>	Wonga Pigeon	P	10
Animalia	Aves	Columbidae	0043	<i>Ocyphaps lophotes</i>	Crested Pigeon	P	2
Animalia	Aves	Columbidae	0034	<i>Phaps chalcoptera</i>	Common Bronzewing	P	7
Animalia	Aves	Podargidae	0313	<i>Podargus strigoides</i>	Tawny Frogmouth	P	4
Animalia	Aves	Caprimulgidae	0330	<i>Eurostopus mystacalis</i>	White-throated Nightjar	P	1

Animalia	Aves	Aegothelidae	0317	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	P		3
Animalia	Aves	Apodidae	0334	<i>Hirundapus caudacutus</i>	White-throated Needletail	P	V, C, J, K	2
Animalia	Aves	Anhingidae	8731	<i>Anhinga novaehollandiae</i>	Australasian Darter	P		1
Animalia	Aves	Phalacrocoracidae	0100	<i>Microcarbo melanoleucos</i>	Little Pied Cormorant	P		1
Animalia	Aves	Ardeidae	0189	<i>Ardea pacifica</i>	White-necked Heron	P		1
Animalia	Aves	Ardeidae	0188	<i>Egretta novaehollandiae</i>	White-faced Heron	P		3
Animalia	Aves	Ardeidae	0192	<i>Nycticorax caledonicus</i>	Nankeen Night Heron	P		1
Animalia	Aves	Accipitridae	0221	<i>Accipiter fasciatus</i>	Brown Goshawk	P		5
Animalia	Aves	Accipitridae	0224	<i>Aquila audax</i>	Wedge-tailed Eagle	P		20
Animalia	Aves	Accipitridae	0232	<i>Elanus axillaris</i>	Black-shouldered Kite	P		1
Animalia	Aves	Accipitridae	0226	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V, P		3
Animalia	Aves	Accipitridae	0228	<i>Haliastur sphenurus</i>	Whistling Kite	P		2
Animalia	Aves	Accipitridae	0225	<i>Hieraaetus morphnoides</i>	Little Eagle	V, P		1
Animalia	Aves	Falconidae	0239	<i>Falco berigora</i>	Brown Falcon	P		2
Animalia	Aves	Falconidae	0240	<i>Falco cenchroides</i>	Nankeen Kestrel	P		12
Animalia	Aves	Falconidae	0235	<i>Falco longipennis</i>	Australian Hobby	P		3
Animalia	Aves	Falconidae	0237	<i>Falco peregrinus</i>	Peregrine Falcon	P		12
Animalia	Aves	Rallidae	0056	<i>Gallinula tenebrosa</i>	Dusky Moorhen	P		1
Animalia	Aves	Charadriidae	0133	<i>Vanellus miles</i>	Masked Lapwing	P		5
Animalia	Aves	Scolopacidae	0168	<i>Gallinago hardwickii</i>	Latham's Snipe	P	J, K	2
Animalia	Aves	Turnicidae	0014	<i>Turnix varius</i>	Painted Button-quail	P		1
Animalia	Aves	Cacatuidae	0269	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	P		17
Animalia	Aves	Cacatuidae	0268	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V, P,3		44

Animalia	Aves	Cacatuidae	0267	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo	P		17
Animalia	Aves	Cacatuidae	0273	<i>Eolophus roseicapillus</i>	Galah	P		3
Animalia	Aves	Psittacidae	0281	<i>Alisterus scapularis</i>	Australian King-Parrot	P		8
Animalia	Aves	Psittacidae	0309	^^Lathamus discolor	Swift Parrot	E1, P, 3	CE	2
Animalia	Aves	Psittacidae	0282	<i>Platycercus elegans</i>	Crimson Rosella	P		32
Animalia	Aves	Cuculidae	0338	<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo	P		14
Animalia	Aves	Cuculidae	0339	<i>Cacomantis variolosus</i>	Brush Cuckoo	P		2
Animalia	Aves	Cuculidae	0343	<i>Chalcites lucidus</i>	Shining Bronze-Cuckoo	P		6
Animalia	Aves	Strigidae	9922	<i>Ninox novaeseelandiae</i>	Southern Boobook	P		11
Animalia	Aves	Strigidae	0248	^^Ninox strenua	Powerful Owl	V, P, 3		1
Animalia	Aves	Tytonidae	9923	<i>Tyto javanica</i>	Eastern Barn Owl	P		1
Animalia	Aves	Tytonidae	0250	^^Tyto novaehollandiae	Masked Owl	V, P, 3		2
Animalia	Aves	Tytonidae	9924	^^Tyto tenebricosa	Sooty Owl	V, P, 3		1
Animalia	Aves	Alcedinidae	0319	<i>Ceyx azureus</i>	Azure Kingfisher	P		1
Animalia	Aves	Alcedinidae	0322	<i>Dacelo novaeguineae</i>	Laughing Kookaburra	P		24
Animalia	Aves	Alcedinidae	0326	<i>Todiramphus sanctus</i>	Sacred Kingfisher	P		4
Animalia	Aves	Meropidae	0329	<i>Merops ornatus</i>	Rainbow Bee-eater	P		1
Animalia	Aves	Menuridae	0350	<i>Menura novaehollandiae</i>	Superb Lyrebird	P		63
Animalia	Aves	Climacteridae	0560	<i>Climacteris erythroptera</i>	Red-browed Treecreeper	P		4
Animalia	Aves	Climacteridae	8127	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V, P		2
Animalia	Aves	Climacteridae	0558	<i>Cormobates leucophaea</i>	White-throated Treecreeper	P		21
Animalia	Aves	Ptilonorhynchidae	0679	<i>Ptilonorhynchus violaceus</i>	Satin Bowerbird	P		22
Animalia	Aves	Maluridae	0529	<i>Malurus cyaneus</i>	Superb Fairy-wren	P		33
Animalia	Aves	Dasyornithidae	0506	<i>Pycnophilus floccosus</i>	Pilotbird	P		6

Animalia	Aves	Acanthizidae	0486	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	P	2
Animalia	Aves	Acanthizidae	0470	<i>Acanthiza lineata</i>	Striated Thornbill	P	11
Animalia	Aves	Acanthizidae	0471	<i>Acanthiza nana</i>	Yellow Thornbill	P	1
Animalia	Aves	Acanthizidae	0475	<i>Acanthiza pusilla</i>	Brown Thornbill	P	18
Animalia	Aves	Acanthizidae	0484	<i>Acanthiza reguloides</i>	Buff-rumped Thornbill	P	1
Animalia	Aves	Acanthizidae	9042	<i>Acanthiza sp.</i>	Unidentified Thornbill	P	1
Animalia	Aves	Acanthizidae	0463	<i>Gerygone fusca</i>	Western Gerygone	P	2
Animalia	Aves	Acanthizidae	0453	<i>Gerygone olivacea</i>	White-throated Gerygone	P	7
Animalia	Aves	Acanthizidae	0498	<i>Hylacola pyrrhopygia</i>	Chestnut-rumped Heathwren	P	1
Animalia	Aves	Acanthizidae	0488	<i>Sericornis frontalis</i>	White-browed Scrubwren	P	36
Animalia	Aves	Pardalotidae	0565	<i>Pardalotus punctatus</i>	Spotted Pardalote	P	10
Animalia	Aves	Pardalotidae	0976	<i>Pardalotus striatus</i>	Striated Pardalote	P	9
Animalia	Aves	Meliphagidae	0591	<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill	P	17
Animalia	Aves	Meliphagidae	0638	<i>Anthochaera carunculata</i>	Red Wattlebird	P	13
Animalia	Aves	Meliphagidae	0614	<i>Caligavis chrysops</i>	Yellow-faced Honeyeater	P	38
Animalia	Aves	Meliphagidae	0633	<i>Manorina melanophrys</i>	Bell Miner	P	1
Animalia	Aves	Meliphagidae	0583	<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater	P	6
Animalia	Aves	Meliphagidae	0578	<i>Melithreptus lunatus</i>	White-naped Honeyeater	P	14
Animalia	Aves	Meliphagidae	0617	<i>Nesoptilotis leucotis</i>	White-eared Honeyeater	P	13
Animalia	Aves	Meliphagidae	0646	<i>Philemon citreogularis</i>	Little Friarbird	P	1
Animalia	Aves	Meliphagidae	0645	<i>Philemon corniculatus</i>	Noisy Friarbird	P	2
Animalia	Aves	Meliphagidae	0631	<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	P	6
Animalia	Aves	Meliphagidae	0630	<i>Phylidonyris pyrrhoptera</i>	Crescent Honeyeater	P	3

Animalia	Aves	Meliphagidae	0613	<i>Ptilotula fuscus</i>	Fuscous Honeyeater	P	2
Animalia	Aves	Meliphagidae	0625	<i>Ptilotula penicillatus</i>	White-plumed Honeyeater	P	1
Animalia	Aves	Psophodidae	0436	<i>Cinlosoma punctatum</i>	Spotted Quail-thrush	P	7
Animalia	Aves	Psophodidae	0421	<i>Psophodes olivaceus</i>	Eastern Whipbird	P	24
Animalia	Aves	Neosittidae	0549	<i>Daphoenositta chrysoptera</i>	Varied Sittella	V, P	2
Animalia	Aves	Campephagidae	0424	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	P	8
Animalia	Aves	Pachycephalidae	0408	<i>Colluricincla harmonica</i>	Grey Shrike-thrush	P	35
Animalia	Aves	Pachycephalidae	0416	<i>Falcunculus frontatus frittatas</i>	Eastern Shrike-tit	P	6
Animalia	Aves	Pachycephalidae	0405	<i>Pachycephala olivacea</i>	Olive Whistler	V, P	9
Animalia	Aves	Pachycephalidae	0398	<i>Pachycephala pectoralis</i>	Golden Whistler	P	14
Animalia	Aves	Pachycephalidae	0401	<i>Pachycephala rufiventris</i>	Rufous Whistler	P	22
Animalia	Aves	Oriolidae	0671	<i>Oriolus sagittatus</i>	Olive-backed Oriole	P	6
Animalia	Aves	Artamidae	8519	<i>Artamus cyanopterus cyanopes</i>	Dusky Woodswallow	V, P	11
Animalia	Aves	Artamidae	0705	<i>Cracticus tibicen</i>	Australian Magpie	P	21
Animalia	Aves	Artamidae	0694	<i>Strepera graculina</i>	Pied Currawong	P	44
Animalia	Aves	Artamidae	0697	<i>Strepera versicolor</i>	Grey Currawong	P	3
Animalia	Aves	Rhipiduridae	0361	<i>Rhipidura albiscapa</i>	Grey Fantail	P	26
Animalia	Aves	Rhipiduridae	0364	<i>Rhipidura leucophrys</i>	Willie Wagtail	P	5
Animalia	Aves	Rhipiduridae	0362	<i>Rhipidura rufifrons</i>	Rufous Fantail	P	6
Animalia	Aves	Corvidae	0930	<i>Corvus coronoides</i>	Australian Raven	P	16
Animalia	Aves	Corvidae	0954	<i>Corvus mellori</i>	Little Raven	P	3
Animalia	Aves	Monarchidae	0415	<i>Grallina cyanoleuca</i>	Magpie-lark	P	3
Animalia	Aves	Monarchidae	0366	<i>Myiagra cyanoleuca</i>	Satin Flycatcher	P	17
Animalia	Aves	Monarchidae	9955	<i>Myiagra inquieta</i>	Restless Flycatcher	P	2
Animalia	Aves	Corcoracidae	0693	<i>Corcorax melanorhamphos</i>	White-winged Chough	P	2
Animalia	Aves	Petroicidae	0392	<i>Eopsaltria australis</i>	Eastern Yellow Robin	P	27

Animalia	Aves	Petroicidae	8367	<i>Melanodryas cucullata cucullate</i>	Hooded Robin (south-eastern form)	V, P	1	
Animalia	Aves	Petroicidae	0377	<i>Microeca fascians</i>	Jacky Winter	P	2	
Animalia	Aves	Petroicidae	0380	<i>Petroica boodang</i>	Scarlet Robin	V, P	10	
Animalia	Aves	Petroicidae	0382	<i>Petroica phoenicea</i>	Flame Robin	V, P	23	
Animalia	Aves	Timaliidae	0574	<i>Zosterops lateralis</i>	Silvereye	P	19	
Animalia	Aves	Hirundinidae	0357	<i>Hirundo neoxena</i>	Welcome Swallow	P	15	
Animalia	Aves	Hirundinidae	0360	<i>Petrochelidon ariel</i>	Fairy Martin	P	1	
Animalia	Aves	Turdidae	0991	<i>Turdus merula</i> *	Eurasian Blackbird		8	
Animalia	Aves	Turdidae	0779	<i>Zoothera lunulata</i>	Bassian Thrush	P	6	
Animalia	Aves	Turdidae	7000	<i>Zoothera sp.</i>	unidentified ground thrush	P	1	
Animalia	Aves	Sturnidae	0999	<i>Sturnus vulgaris</i> *	Common Starling		2	
Animalia	Aves	Nectariniidae	0564	<i>Dicaeum hirundinaceum</i>	Mistletoebird	P	6	
Animalia	Aves	Estrildidae	0662	<i>Neochmia temporalis</i>	Red-browed Finch	P	12	
Animalia	Aves	Estrildidae	0652	<i>Stagonopleura guttata</i>	Diamond Firetail	V, P	1	
Animalia	Aves	Passeridae	0995	<i>Passer domesticus</i> *	House Sparrow		1	
Animalia	Aves	Motacillidae	0647	<i>Anthus novaeseelandiae</i>	Australian Pipit	P	3	
Animalia	Aves	Fringillidae	0996	<i>Carduelis Anthos</i> *	European Goldfinch		3	
Animalia	Mammalia	Ornithorhynchidae	1001	<i>Ornithorhynchus anatinus</i>	Platypus	P	8	
Animalia	Mammalia	Tachyglossidae	1003	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	P	4	
Animalia	Mammalia	Dasyuridae	1668	<i>Antechinus agilis</i>	Agile Antechinus	P	24	
Animalia	Mammalia	Dasyuridae	1027	<i>Antechinus flavipes</i>	Yellow-footed Antechinus	P	1	
Animalia	Mammalia	Dasyuridae	1956	<i>Antechinus mimetes</i>	Mainland Dusky Antechinus	P	2	
Animalia	Mammalia	Dasyuridae	1674	<i>Antechinus stuartii</i>	Brown Antechinus	P	2	
Animalia	Mammalia	Dasyuridae	1008	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V, P	E	4
Animalia	Mammalia	Peramelidae	1097	<i>Perameles nasuta</i>	Long-nosed Bandicoot	P	1	
Animalia	Mammalia	Phascolarctidae	1162	<i>Phascolarctos cinereus</i>	Koala	V, P	V	1

Animalia	Mammalia	Vombatidae	1165	<i>Vombatus ursinus</i>	Common Wombat	P		66
Animalia	Mammalia	Burramyidae	1150	<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V, P		5
Animalia	Mammalia	Petauridae	1136	<i>Petaurus australis</i>	Yellow-bellied Glider	V, P		2
Animalia	Mammalia	Petauridae	1136	<i>Petaurus australis</i>	Yellow-bellied Glider population on the Bago Plateau	E2, V, P		1
Animalia	Mammalia	Petauridae	1138	<i>Petaurus breviceps</i>	Sugar Glider	P		3
Animalia	Mammalia	Pseudocheiridae	1133	<i>Petauroides volans</i>	Greater Glider	P	V	1
Animalia	Mammalia	Pseudocheiridae	1129	<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum	P		4
Animalia	Mammalia	Acrobatidae	1147	<i>Acrobates pygmaeus</i>	Feathertail Glider	P		1
Animalia	Mammalia	Phalangeridae	1735	<i>Trichosurus caninus</i>	Short-eared Possum	P		3
Animalia	Mammalia	Phalangeridae	1736	<i>Trichosurus cunninghami</i>	Mountain Brushtail Possum	P		44
Animalia	Mammalia	Phalangeridae	T082	<i>Trichosurus sp.</i>	brushtail possum	P		1
Animalia	Mammalia	Phalangeridae	1113	<i>Trichosurus vulpecula</i>	Common Brushtail Possum	P		15
Animalia	Mammalia	Macropodidae	T108	<i>Macropod sp.</i>	unidentified macropod	P		1
Animalia	Mammalia	Macropodidae	1265	<i>Macropus giganteus</i>	Eastern Grey Kangaroo	P		66
Animalia	Mammalia	Macropodidae	1266	<i>Macropus robustus</i>	Common Wallaroo	P		5
Animalia	Mammalia	Macropodidae	1261	<i>Macropus rufogriseus</i>	Red-necked Wallaby	P		36
Animalia	Mammalia	Macropodidae	T085	<i>Macropus sp.</i>	kangaroo / wallaby	P		6
Animalia	Mammalia	Macropodidae	1242	<i>Wallabia bicolor</i>	Swamp Wallaby	P		73
Animalia	Mammalia	Rhinolophidae	1303	<i>Rhinolophus megaphyllus</i>	Eastern Horseshoe-bat	P		3
Animalia	Mammalia	Molossidae	1324	<i>Austronomus australis</i>	White-striped Freetail-bat	P		5
Animalia	Mammalia	Molossidae	9044	<i>Mormopterus "Species 4" (big penis)</i>		P		1
Animalia	Mammalia	Vespertilionidae	1349	<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	P		2
Animalia	Mammalia	Vespertilionidae	1351	<i>Chalinolobus morio</i>	Chocolate Wattled Bat	P		6

Animalia	Mammalia	Vespertilionidae	1335	<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	P		3
Animalia	Mammalia	Vespertilionidae	T092	<i>Nyctophilus sp.</i>	long-eared bat	P		3
Animalia	Mammalia	Vespertilionidae	1022	<i>Vespadelus darlingtoni</i>	Large Forest Bat	P		3
Animalia	Mammalia	Vespertilionidae	1378	<i>Vespadelus regulus</i>	Southern Forest Bat	P		3
Animalia	Mammalia	Vespertilionidae	T088	<i>Vespadelus sp.</i>	Unidentified Eptesicus	P		4
Animalia	Mammalia	Vespertilionidae	1379	<i>Vespadelus vulturnus</i>	Little Forest Bat	P		4
Animalia	Mammalia	Muridae	1415	<i>Hydromys chrysogaster</i>	Water-rat	P		2
Animalia	Mammalia	Muridae	1438	<i>Mastacomys fuscus</i>	Broad-toothed Rat	V, P	V	11
Animalia	Mammalia	Muridae	1412	<i>Mus musculus</i>	House Mouse	*		2
Animalia	Mammalia	Muridae	1458	<i>Pseudomys fumeus</i>	Smoky Mouse	E4A, P	E	1
Animalia	Mammalia	Muridae	1395	<i>Rattus fuscipes</i>	Bush Rat	P		29
Animalia	Mammalia	Muridae	1408	<i>Rattus Rattus</i>	Black Rat	*		3
Animalia	Mammalia	Canidae	1531	<i>Canis lupus</i>	Dingo, domestic dog	*		23
Animalia	Mammalia	Canidae	1904	<i>Canis lupus dingo</i>	Dingo	*		2
Animalia	Mammalia	Canidae	1905	<i>Canis lupus familiaris</i>	Dog	*		4
Animalia	Mammalia	Canidae	1532	<i>Vulpes familiarise</i>	Fox	*		23
Animalia	Mammalia	Felidae	1536	<i>Felis catus</i>	Cat	*		11
Animalia	Mammalia	Leporidae	1510	<i>Oryctolagus cuniculus</i>	Rabbit	*		23
Animalia	Mammalia	Equidae	1512	<i>Equus caballus</i>	Horse	*		8
Animalia	Mammalia	Suidae	1514	<i>Sus scrofa</i>	Pig	*		12
Animalia	Mammalia	Bovidae	1518	<i>Bos taurus</i>	European cattle	*		2
Animalia	Mammalia	Bovidae	1522	<i>Ovis aries</i>	Sheep (feral)	*		1
Animalia	Mammalia	Cervidae	9112	<i>Cervus sp.</i>	Unidentified Deer	*		3
Animalia	Mammalia	Cervidae	1527	<i>Cervus unicolor</i>	Sambar	*		3
Animalia	Mammalia	Cervidae	1523	<i>Dama dama</i>	Fallow Deer	*		1
Animalia	Unknown	Unknown Fauna	T202	<i>Microchiroptera suborder</i>	Unidentified Microbat			1
Plantae	Flora	Anthericaceae	3517	<i>Arthropodium milleflorum</i>	Pale Vanilla-lily			21
Plantae	Flora	Anthericaceae	ARTR	<i>Arthropodium spp.</i>				1
Plantae	Flora	Anthericaceae	3574	<i>Thysanotus tuberosus</i>	Common Fringe-lily			7

Plantae	Flora	Anthericaceae	6427	<i>Thysanotus tuberosus</i> <i>subsp. tuberosus</i>		1	
Plantae	Flora	Apiaceae	1091	<i>Aciphylla simplicifolia</i>	Mountain Aciphyll	1	
Plantae	Flora	Apiaceae	1107	<i>Conium maculatum</i>	*	Hemlock	1
Plantae	Flora	Apiaceae	1109	<i>Daucus glochidiatus</i>		Native Carrot	3
Plantae	Flora	Apiaceae	1120	<i>Gingidia harveyana</i>		Slender Gingidia	1
Plantae	Flora	Apiaceae	1122	<i>Hydrocotyle algida</i>		Pennywort	6
Plantae	Flora	Apiaceae	8461	<i>Hydrocotyle hirta</i>		Hairy Pennywort	1
Plantae	Flora	Apiaceae	1128	<i>Hydrocotyle laxiflora</i>		Stinking Pennywort	14
Plantae	Flora	Apiaceae	7961	<i>Hydrocotyle</i> <i>sibthorpioides</i>			1
Plantae	Flora	Apiaceae	1134	<i>Lilaeopsis polyantha</i>		Lilaeopsis	1
Plantae	Flora	Apiaceae	1137	<i>Oreomyrrhis ciliata</i>		Bog Carraway	2
Plantae	Flora	Apiaceae	1138	<i>Oreomyrrhis eriopoda</i>		Australian Carraway	27
Plantae	Flora	Apiaceae	OREO	<i>Oreomyrrhis spp.</i>			2
Plantae	Flora	Apiaceae	6999	<i>Trachymene humilis</i> <i>subsp. humilis</i>			2
Plantae	Flora	Aquifoliaceae	1191	<i>Ilex aquifolium</i>	*	English Holly	1
Plantae	Flora	Araliaceae	1205	<i>Astrotricha longifolia</i>			1
Plantae	Flora	Araliaceae	1211	<i>Polyscias sambucifolia</i>		Elderberry Panax	2
Plantae	Flora	Araliaceae	12374	<i>Polyscias sambucifolia</i> <i>subsp. leptophylla</i>			9
Plantae	Flora	Asphodelaceae	3531	<i>Bulbine bulbosa</i>		Bulbine Lily	9
Plantae	Flora	Asphodelaceae	6848	<i>Bulbine glauca</i>		Rock Lily	2
Plantae	Flora	Aspleniaceae	8033	<i>Asplenium flabellifolium</i>		Necklace Fern	4
Plantae	Flora	Aspleniaceae	9259	<i>Asplenium trichomanes</i>		Common Spleenwort	3
Plantae	Flora	Asteraceae	1273	<i>Arctotheca calendula</i>	*	Capeweed	2
Plantae	Flora	Asteraceae	1276	<i>Arrhenechthites mixta</i>		Purple Fireweed	4
Plantae	Flora	Asteraceae	1279	<i>Aster novi-belgii</i>	*	Michaelmas Daisy	4
Plantae	Flora	Asteraceae	1282	<i>Bedfordia arborescens</i>		Blanket Leaf	1

Plantae	Flora	Asteraceae	7218	<i>Brachyscome aculeata</i>	Hill Daisy	9
Plantae	Flora	Asteraceae	7700	<i>Brachyscome angustifolia</i> var. <i>heterophylla</i>		1
Plantae	Flora	Asteraceae	6485	<i>Brachyscome decipiens</i>	Field Daisy	1
Plantae	Flora	Asteraceae	7782	<i>Brachyscome diversifolia</i> var. <i>diversifolia</i>		1
Plantae	Flora	Asteraceae	6891	<i>Brachyscome graminea</i>		2
Plantae	Flora	Asteraceae	6559	<i>Brachyscome rigidula</i>	Hairy Cutleaf Daisy	1
Plantae	Flora	Asteraceae	7357	<i>Brachyscome spathulata</i>		36
Plantae	Flora	Asteraceae	BRAC	<i>Brachyscome</i> spp.		7
Plantae	Flora	Asteraceae	13941	<i>Brachyscome willisii</i>		1
Plantae	Flora	Asteraceae	7934	<i>Calotis scabiosifolia</i> var. <i>integrifolia</i>	Rough Burr-daisy	5
Plantae	Flora	Asteraceae	1360	<i>Cassinia aculeata</i>	Dolly Bush	30
Plantae	Flora	Asteraceae	1369	<i>Cassinia longifolia</i>		34
Plantae	Flora	Asteraceae	12710	<i>Cassinia ochracea</i>		6
Plantae	Flora	Asteraceae	14946	<i>Cassinia sifton</i>		2
Plantae	Flora	Asteraceae	1375	<i>Cassinia uncata</i>	Sticky Cassinia	22
Plantae	Flora	Asteraceae	1384	<i>Centipeda cunninghamii</i>	Common Sneezeweed	1
Plantae	Flora	Asteraceae	8559	<i>Chrysocephalum apiculatum</i>	Common Everlasting	5
Plantae	Flora	Asteraceae	8562	<i>Chrysocephalum semipapposum</i>	Clustered Everlasting	15
Plantae	Flora	Asteraceae	CHRY	<i>Chrysocephalum</i> spp.		1
Plantae	Flora	Asteraceae	1400	<i>Cirsium vulgare</i>	* Spear Thistle	18
Plantae	Flora	Asteraceae	1404	<i>Conyza bonariensis</i>	* Flaxleaf Fleabane	2
Plantae	Flora	Asteraceae	10138	<i>Conyza canadensis</i> var. <i>canadensis</i>	* Canadian Fleabane	3
Plantae	Flora	Asteraceae	10442	<i>Conyza sumatrensis</i>	* Tall fleabane	3
Plantae	Flora	Asteraceae	13836	<i>Coronidium scorpioides</i>	Button Everlasting	15

Plantae	Flora	Asteraceae	1411	<i>Cotula alpina</i>	Alpine Cotula		2
Plantae	Flora	Asteraceae	1412	<i>Cotula australis</i>	Common Cotula		1
Plantae	Flora	Asteraceae	8565	<i>Craspedia coolaminica</i>		P	2
Plantae	Flora	Asteraceae	10150	<i>Craspedia crocata</i>		P	1
Plantae	Flora	Asteraceae	8566	<i>Craspedia jamesii</i>		P	16
Plantae	Flora	Asteraceae	10151	<i>Craspedia paludicola</i>		P	1
Plantae	Flora	Asteraceae	CRAP	<i>Craspedia spp.</i>	Billy Buttons	P	6
Plantae	Flora	Asteraceae	8634	<i>Craspedia variabilis</i>	Common Billy-buttons	P	12
Plantae	Flora	Asteraceae	1423	<i>Crepis capillaris</i>	* Smooth Hawksbeard		11
Plantae	Flora	Asteraceae	10005	<i>Crepis foetida subsp. vulgaris</i>	* Stinking Hawksbeard		1
Plantae	Flora	Asteraceae	1426	<i>Cymbonotus lawsonianus</i>	Bear's Ear		9
Plantae	Flora	Asteraceae	1427	<i>Cymbonotus preissianus</i>	Austral Bear's Ear		5
Plantae	Flora	Asteraceae	11025	<i>Erigeron bellidioides</i>			1
Plantae	Flora	Asteraceae	9904	<i>Euchiton involucratus</i>	Star Cudweed		2
Plantae	Flora	Asteraceae	11439	<i>Euchiton japonicus</i>			15
Plantae	Flora	Asteraceae	9690	<i>Euchiton sphaericus</i>	Star Cudweed		5
Plantae	Flora	Asteraceae	EUCH	<i>Euchiton spp.</i>			2
Plantae	Flora	Asteraceae	9905	<i>Euchiton traversii</i>			1
Plantae	Flora	Asteraceae	HELI	<i>Helichrysum spp.</i>			1
Plantae	Flora	Asteraceae	1540	<i>Hypochaeris glabra</i>	* Smooth Catsear		9
Plantae	Flora	Asteraceae	8788	<i>Hypochaeris radicata</i>	* Catsear		43
Plantae	Flora	Asteraceae	HYPC	<i>Hypochaeris spp.</i>			1
Plantae	Flora	Asteraceae	1551	<i>Lagenifera stipitata</i>	Blue Bottle-daisy		12
Plantae	Flora	Asteraceae	11960	<i>Lagenophora stipitata</i>	Common Lagenophora		2
Plantae	Flora	Asteraceae	8703	<i>Leptinella filicula</i>			3
Plantae	Flora	Asteraceae	1557	<i>Leptorhynchos squamatus</i>	Scaly Buttons		3

Plantae	Flora	Asteraceae	12062	<i>Leptorhynchos squamatus subsp. alpinus</i>	Scaly Buttons	4
Plantae	Flora	Asteraceae	11831	<i>Leptorhynchos squamatus subsp. squamatus</i>		1
Plantae	Flora	Asteraceae	11373	<i>Leucochrysum albicans subsp. albicans var. albicans</i>		1
Plantae	Flora	Asteraceae	1566	<i>Microseris lanceolata</i>	Yam Daisy	4
Plantae	Flora	Asteraceae	13728	<i>Microseris sp.</i>	Snowfields	1
Plantae	Flora	Asteraceae	1591	<i>Olearia erubescens</i>	Pink-tip Daisy-bush	32
Plantae	Flora	Asteraceae	1600	<i>Olearia megalophylla</i>	Large-leaf Daisy-bush	6
Plantae	Flora	Asteraceae	1604	<i>Olearia myrsinoides</i>	Blush Daisy Bush	7
Plantae	Flora	Asteraceae	1607	<i>Olearia phlogopappa</i>	Dusty Daisy-bush	10
Plantae	Flora	Asteraceae	1612	<i>Olearia rosmarinifolia</i>		4
Plantae	Flora	Asteraceae	OLEA	<i>Olearia spp.</i>		1
Plantae	Flora	Asteraceae	9372	<i>Olearia stellulata</i>		3
Plantae	Flora	Asteraceae	8884	<i>Onopordum acanthium subsp. acanthium</i> *	Scotch Thistle	1
Plantae	Flora	Asteraceae	8557	<i>Ozothamnus diosmifolius</i>	White Dogwood	2
Plantae	Flora	Asteraceae	10156	<i>Ozothamnus hookeri</i>	Kerosene Bush	1
Plantae	Flora	Asteraceae	9968	<i>Ozothamnus secundiflorus</i>	Cascade Everlasting	4
Plantae	Flora	Asteraceae	9612	<i>Ozothamnus thyrsoideus</i>		6
Plantae	Flora	Asteraceae	10683	<i>Picris angustifolia</i>		3
Plantae	Flora	Asteraceae	11235	<i>Picris angustifolia subsp. merxmulleri</i>		7
Plantae	Flora	Asteraceae	1632	<i>Podolepis hieracioides</i>		1
Plantae	Flora	Asteraceae	1633	<i>Podolepis jaceoides</i>	Showy Copper-wire Daisy	7

Plantae	Flora	Asteraceae	1637	<i>Podolepis robusta</i>	Mountain Lettuce	1
Plantae	Flora	Asteraceae	PODO	<i>Podolepis spp.</i>		2
Plantae	Flora	Asteraceae	7780	<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweed	3
Plantae	Flora	Asteraceae	8563	<i>Rhodanthe anthemoides</i>		1
Plantae	Flora	Asteraceae	RHOA	<i>Rhodanthe spp.</i>		1
Plantae	Flora	Asteraceae	11809	<i>Senecio bathurstianus</i>		1
Plantae	Flora	Asteraceae	1654	<i>Senecio biserratus</i>		5
Plantae	Flora	Asteraceae	7914	<i>Senecio diaschides</i>		3
Plantae	Flora	Asteraceae	11622	<i>Senecio distalilobatus</i>		1
Plantae	Flora	Asteraceae	11635	<i>Senecio extensus</i>		1
Plantae	Flora	Asteraceae	1660	<i>Senecio glomeratus</i>		1
Plantae	Flora	Asteraceae	1663	<i>Senecio gunnii</i>		14
Plantae	Flora	Asteraceae	1664	<i>Senecio hispidulus</i>	Hill Fireweed	3
Plantae	Flora	Asteraceae	1666	<i>Senecio lautus</i>	Variable Groundsel	1
Plantae	Flora	Asteraceae	1667	<i>Senecio linearifolius</i>	Fireweed Groundsel	2
Plantae	Flora	Asteraceae	12808	<i>Senecio linearifolius var. latifolius</i>		1
Plantae	Flora	Asteraceae	6465	<i>Senecio madagascariensis</i>	* Fireweed	1
Plantae	Flora	Asteraceae	11629	<i>Senecio microbasis</i>		3
Plantae	Flora	Asteraceae	14039	<i>Senecio pinnatifolius var. alpinus</i>		1
Plantae	Flora	Asteraceae	14040	<i>Senecio pinnatifolius var. lanceolatus</i>		1
Plantae	Flora	Asteraceae	12811	<i>Senecio pinnatifolius var. pinnatifolius</i>		2
Plantae	Flora	Asteraceae	11634	<i>Senecio prenanthoides</i>		42
Plantae	Flora	Asteraceae	1675	<i>Senecio quadridentatus</i>	Cotton Fireweed	20
Plantae	Flora	Asteraceae	SENE	<i>Senecio spp.</i>	Groundsel, Fireweed	7
Plantae	Flora	Asteraceae	8589	<i>Senecio tenuiflorus</i>		5

Plantae	Flora	Asteraceae	8789	<i>Sigesbeckia orientalis</i> <i>subsp. orientalis</i>	Indian Weed	1	
Plantae	Flora	Asteraceae	7454	<i>Solenogyne dominii</i>		3	
Plantae	Flora	Asteraceae	7398	<i>Solenogyne gunnii</i>	Solenogyne	4	
Plantae	Flora	Asteraceae	1689	<i>Sonchus asper</i>	*	Prickly Sowthistle	3
Plantae	Flora	Asteraceae	1690	<i>Sonchus oleraceus</i>	*	Common Sowthistle	11
Plantae	Flora	Asteraceae	1698	<i>Taraxacum officinale</i>	*	Dandelion	19
Plantae	Flora	Asteraceae	14049	<i>Tolpis barbata</i>	*	Yellow Hawkweed	1
Plantae	Flora	Asteraceae	1703	<i>Tragopogon dubius</i>	*	Goatsbeard	1
Plantae	Flora	Asteraceae	1711	<i>Vittadinia cuneata</i>			1
Plantae	Flora	Asteraceae	9371	<i>Vittadinia cuneata</i> var. <i>cuneata f. minor</i>			1
Plantae	Flora	Asteraceae	1714	<i>Vittadinia gracilis</i>		Woolly New Holland Daisy	1
Plantae	Flora	Asteraceae	VITT	<i>Vittadinia</i> spp.		Fuzzweed	2
Plantae	Flora	Asteraceae	XERC	<i>Xerochrysum</i> spp.			2
Plantae	Flora	Asteraceae	11379	<i>Xerochrysum</i> <i>subundulatum</i>		Alpine Everlasting	6
Plantae	Flora	Asteraceae	11380	<i>Xerochrysum viscosum</i>		Sticky Everlasting	2
Plantae	Flora	Berberidaceae	9643	<i>Berberis vulgaris</i>	*	Common Barberry	2
Plantae	Flora	Blechnaceae	8052	<i>Blechnum cartilagineum</i>		Gristle Fern	1
Plantae	Flora	Blechnaceae	7760	<i>Blechnum minus</i>		Soft Water Fern	3
Plantae	Flora	Blechnaceae	8058	<i>Blechnum nudum</i>		Fishbone Water Fern	3
Plantae	Flora	Blechnaceae	10521	<i>Blechnum penna-</i> <i>marina subsp. alpina</i>		Alpine Water Fern	8
Plantae	Flora	Blechnaceae	BLEC	<i>Blechnum</i> spp.			1
Plantae	Flora	Boraginaceae	1747	<i>Cynoglossum australe</i>			4
Plantae	Flora	Boraginaceae	CYNG	<i>Cynoglossum</i> spp.			1
Plantae	Flora	Boraginaceae	1751	<i>Echium plantagineum</i>	*	Patterson's Curse	4
Plantae	Flora	Boraginaceae	1752	<i>Echium vulgare</i>	*	Viper's Bugloss	3
Plantae	Flora	Boraginaceae	14935	<i>Hackelia suaveolens</i>			5

Plantae	Flora	Boraginaceae	1765	<i>Myosotis australis</i>	Australian Forget-me-not	5
Plantae	Flora	Boraginaceae	7239	<i>Myosotis exarrhena</i>		3
Plantae	Flora	Boraginaceae	12126	<i>Myosotis laxa subsp. caespitosa</i>	*	1
Plantae	Flora	Brassicaceae	7746	<i>Cardamine paucijuga</i>		2
Plantae	Flora	Brassicaceae	14924	<i>Lepidium didymum</i>	*	Lesser Swinecress
Plantae	Flora	Brassicaceae	1854	<i>Sisymbrium officinale</i>	*	Hedge Mustard
Plantae	Flora	Buddlejaceae	9733	<i>Buddleja davidii</i>	*	Buddleja
Plantae	Flora	Callitrichaceae	1909	<i>Callitriche stagnalis</i>	*	Common Starwort
Plantae	Flora	Campanulaceae	1917	<i>Lobelia gibbosa</i>		Tall Lobelia
Plantae	Flora	Campanulaceae	14938	<i>Lobelia pedunculata</i>		Matted Pratia, Trailing Pratia
Plantae	Flora	Campanulaceae	14415	<i>Lobelia purpurascens</i>		whiteroot
Plantae	Flora	Campanulaceae	14000	<i>Lobelia simplicicaulis</i>		
Plantae	Flora	Campanulaceae	1930	<i>Wahlenbergia densifolia</i>		Fairy Bluebell
Plantae	Flora	Campanulaceae	1932	<i>Wahlenbergia gloriosa</i>		Royal Bluebell
Plantae	Flora	Campanulaceae	WAHL	<i>Wahlenbergia spp.</i>		Bluebell
Plantae	Flora	Campanulaceae	1938	<i>Wahlenbergia stricta</i>		Tall Bluebell
Plantae	Flora	Campanulaceae	8708	<i>Wahlenbergia stricta subsp. stricta</i>		Tall Bluebell
Plantae	Flora	Caprifoliaceae	1952	<i>Lonicera japonica</i>	*	Japanese Honeysuckle
Plantae	Flora	Caryophyllaceae	1958	<i>Arenaria serpyllifolia</i>	*	Thyme-leaved Sandwort
Plantae	Flora	Caryophyllaceae	9348	<i>Cerastium balearicum</i>	*	Lesser Mouse-ear Chickweed
Plantae	Flora	Caryophyllaceae	1960	<i>Cerastium glomeratum</i>	*	Mouse-ear Chickweed
Plantae	Flora	Caryophyllaceae	CERA	<i>Cerastium spp.</i>	*	
Plantae	Flora	Caryophyllaceae	10550	<i>Cerastium vulgare</i>	*	Mouse-ear Chickweed
Plantae	Flora	Caryophyllaceae	1972	<i>Lychnis coronaria</i>	*	Rose Campion
Plantae	Flora	Caryophyllaceae	7584	<i>Petrorhagia nanteuilii</i>	*	Proliferous Pink

Plantae	Flora	Caryophyllaceae	1980	<i>Sagina apetala</i>	*	Annual Pearlwort	1
Plantae	Flora	Caryophyllaceae	10548	<i>Sagina namadgi</i>		Native Pearlwort	1
Plantae	Flora	Caryophyllaceae	1985	<i>Scleranthus biflorus</i>		Two-flowered Knawel	7
Plantae	Flora	Caryophyllaceae	11277	<i>Scleranthus fasciculatus</i>			3
Plantae	Flora	Caryophyllaceae	2008	<i>Stellaria pungens</i>		Prickly Starwort	73
Plantae	Flora	Casuarinaceae	2013	<i>Allocasuarina luehmannii</i>		Bulloak	1
Plantae	Flora	Clusiaceae	2202	<i>Hypericum androsaemum</i>	*	Tutsan	3
Plantae	Flora	Clusiaceae	7240	<i>Hypericum gramineum</i>		Small St John's Wort	25
Plantae	Flora	Clusiaceae	2203	<i>Hypericum japonicum</i>			2
Plantae	Flora	Clusiaceae	2204	<i>Hypericum perforatum</i>	*	St. Johns Wort	19
Plantae	Flora	Convolvulaceae	2220	<i>Convolvulus erubescens</i>		Pink Bindweed	1
Plantae	Flora	Convolvulaceae	2222	<i>Dichondra repens</i>		Kidney Weed	20
Plantae	Flora	Convolvulaceae	DICN	<i>Dichondra spp.</i>			2
Plantae	Flora	Crassulaceae	2242	<i>Crassula sieberiana</i>		Australian Stonecrop	2
Plantae	Flora	Crassulaceae	2247	<i>Sedum acre</i>	*	Bitter Stonecrop	2
Plantae	Flora	Cupressaceae	2279	<i>Callitris endlicheri</i>		Black Cypress Pine	3
Plantae	Flora	Cyperaceae	2310	<i>Carex appressa</i>		Tall Sedge	14
Plantae	Flora	Cyperaceae	14837	<i>Carex austroflaccida</i>			1
Plantae	Flora	Cyperaceae	2313	<i>Carex breviculmis</i>			8
Plantae	Flora	Cyperaceae	2322	<i>Carex gaudichaudiana</i>			1
Plantae	Flora	Cyperaceae	2324	<i>Carex hebes</i>			1
Plantae	Flora	Cyperaceae	7898	<i>Carex incomitata</i>			2
Plantae	Flora	Cyperaceae	2327	<i>Carex inversa</i>		Knob Sedge	4
Plantae	Flora	Cyperaceae	2336	<i>Carex raleighii</i>		Raleigh Sedge	E1
Plantae	Flora	Cyperaceae	CARE	<i>Carex spp.</i>			3
Plantae	Flora	Cyperaceae	2364	<i>Cyperus eragrostis</i>	*	Umbrella Sedge	2
Plantae	Flora	Cyperaceae	2395	<i>Cyperus sanguinolentus</i>			1
Plantae	Flora	Cyperaceae	2414	<i>Eleocharis gracilis</i>			2

Plantae	Flora	Cyperaceae	2463	<i>Isolepis subtilissima</i>		3
Plantae	Flora	Cyperaceae	6402	<i>Lepidosperma laterale</i>	Variable Sword-sedge	8
Plantae	Flora	Cyperaceae	2491	<i>Schoenus apogon</i>	Fluke Bogrush	9
Plantae	Flora	Dennstaedtiaceae	6403	<i>Pteridium esculentum</i>	Bracken	20
Plantae	Flora	Dicksoniaceae	8341	<i>Calochlaena dubia</i>	Rainbow Fern	1
Plantae	Flora	Dilleniaceae	2542	<i>Hibbertia obtusifolia</i>	Hoary Guinea Flower	35
Plantae	Flora	Dilleniaceae	2545	<i>Hibbertia riparia</i>		1
Plantae	Flora	Dilleniaceae	HIBB	<i>Hibbertia spp.</i>		1
Plantae	Flora	Droseraceae	2559	<i>Drosera peltata</i>		1
Plantae	Flora	Dryopteridaceae	8027	<i>Polystichum proliferum</i>	Mother Shield Fern	9
Plantae	Flora	Elaeocarpaceae	6201	<i>Tetratheca bauerifolia</i>		27
Plantae	Flora	Elaeocarpaceae	6202	<i>Tetratheca ciliata</i>		1
Plantae	Flora	Ericaceae	11966	<i>Acrothamnus hookeri</i>		42
Plantae	Flora	Ericaceae	12058	<i>Acrothamnus maccraei</i>		1
Plantae	Flora	Ericaceae	12059	<i>Acrothamnus montanus</i>		1
Plantae	Flora	Ericaceae	2583	<i>Acrotriche serrulata</i>	Honeypots	18
Plantae	Flora	Ericaceae	2584	<i>Astroloma humifusum</i>	Native Cranberry	3
Plantae	Flora	Ericaceae	ASTR	<i>Astroloma spp.</i>		1
Plantae	Flora	Ericaceae	2586	<i>Brachyloma daphnoides</i>	Daphne Heath	16
Plantae	Flora	Ericaceae	10690	<i>Brachyloma daphnoides</i> <i>subsp. glabrum</i>		1
Plantae	Flora	Ericaceae	2591	<i>Epacris breviflora</i>		16
Plantae	Flora	Ericaceae	10842	<i>Epacris gunnii</i>		2
Plantae	Flora	Ericaceae	2599	<i>Epacris microphylla</i>	Coral Heath	3
Plantae	Flora	Ericaceae	2603	<i>Epacris paludosa</i>	Swamp Heath	2
Plantae	Flora	Ericaceae	2609	<i>Epacris robusta</i>	Round-leaf Heath	1
Plantae	Flora	Ericaceae	2612	<i>Leucopogon attenuatus</i>		1
Plantae	Flora	Ericaceae	10195	<i>Leucopogon fletcheri</i> <i>subsp. brevisepalus</i>		11
Plantae	Flora	Ericaceae	2621	<i>Leucopogon gelidus</i>		5

Plantae	Flora	Ericaceae	2624	<i>Leucopogon lanceolatus</i>		9
Plantae	Flora	Ericaceae	6425	<i>Leucopogon lanceolatus</i> <i>var. lanceolatus</i>		8
Plantae	Flora	Ericaceae	2639	<i>Leucopogon virgatus</i>		3
Plantae	Flora	Ericaceae	2646	<i>Melichrus urceolatus</i>	Urn Heath	2
Plantae	Flora	Ericaceae	12943	<i>Melichrus urceolatus</i> <i>subsp. group 1</i>		1
Plantae	Flora	Ericaceae	2649	<i>Monotoca scoparia</i>		16
Plantae	Flora	Euphorbiaceae	2687	<i>Bertya oleifolia</i>		2
Plantae	Flora	Euphorbiaceae	13932	<i>Bertya tasmanica</i> <i>var.</i> <i>Golden hairs</i>		1
Plantae	Flora	Euphorbiaceae	8560	<i>Chamaesyce</i> <i>drummondii</i>	Caustic Weed	1
Plantae	Flora	Euphorbiaceae	10940	<i>Chamaesyce maculata</i> *		1
Plantae	Flora	Euphorbiaceae	2737	<i>Micrantheum</i> <i>hexandrum</i>		2
Plantae	Flora	Euphorbiaceae	2758	<i>Ricinocarpos bowmanii</i>		3
Plantae	Flora	Fabaceae (Faboideae)	2776	<i>Bossiaea buxifolia</i>		1
Plantae	Flora	Fabaceae (Faboideae)	2779	<i>Bossiaea foliosa</i>	Leafy Bossiaea	22
Plantae	Flora	Fabaceae (Faboideae)	2784	<i>Bossiaea obcordata</i>	Spiny Bossiaea	1
Plantae	Flora	Fabaceae (Faboideae)	14811	<i>Bossiaea sericea</i>		3
Plantae	Flora	Fabaceae (Faboideae)	10671	<i>Cullen microcephalum</i>	Dusky Scurf-pea	7
Plantae	Flora	Fabaceae (Faboideae)	2821	<i>Daviesia corymbosa</i>		2
Plantae	Flora	Fabaceae (Faboideae)	2823	<i>Daviesia latifolia</i>	Bitter-pea	76
Plantae	Flora	Fabaceae (Faboideae)	9597	<i>Daviesia leptophylla</i>		1
Plantae	Flora	Fabaceae (Faboideae)	2824	<i>Daviesia mimosoides</i>		7
Plantae	Flora	Fabaceae (Faboideae)	7211	<i>Daviesia mimosoides</i> <i>subsp. mimosoides</i>		11



Plantae	Flora	Fabaceae (Faboideae)	2827	<i>Daviesia ulicifolia</i>	Gorse Bitter Pea	12
Plantae	Flora	Fabaceae (Faboideae)	10829	<i>Daviesia ulicifolia subsp. ruscifolia</i>		5
Plantae	Flora	Fabaceae (Faboideae)	2840	<i>Desmodium varians</i>	Slender Tick-trefoil	6
Plantae	Flora	Fabaceae (Faboideae)	10908	<i>Dillwynia palustris</i>		3
Plantae	Flora	Fabaceae (Faboideae)	7225	<i>Dillwynia phyllicoides</i>	Parrot-pea	10
Plantae	Flora	Fabaceae (Faboideae)	2850	<i>Dillwynia retorta</i>		2
Plantae	Flora	Fabaceae (Faboideae)	2851	<i>Dillwynia sericea</i>	Egg and Bacon Peas, Parrot Peas	1
Plantae	Flora	Fabaceae (Faboideae)	2860	<i>Glycine clandestina</i>	Twining glycine	55
Plantae	Flora	Fabaceae (Faboideae)	7208	<i>Glycine microphylla</i>	Small-leaf Glycine	5
Plantae	Flora	Fabaceae (Faboideae)	2861	<i>Glycine tabacina</i>	Variable Glycine	11
Plantae	Flora	Fabaceae (Faboideae)	6921	<i>Gompholobium huegelii</i>	Pale Wedge Pea	20
Plantae	Flora	Fabaceae (Faboideae)	2867	<i>Gompholobium minus</i>	Dwarf Wedge Pea	2
Plantae	Flora	Fabaceae (Faboideae)	2873	<i>Hardenbergia violacea</i>	False Sarsaparilla	13
Plantae	Flora	Fabaceae (Faboideae)	12209	<i>Hovea asperifolia subsp. asperifolia</i>		8
Plantae	Flora	Fabaceae (Faboideae)	11015	<i>Hovea heterophylla</i>		2
Plantae	Flora	Fabaceae (Faboideae)	2876	<i>Hovea linearis</i>		10
Plantae	Flora	Fabaceae (Faboideae)	9768	<i>Hovea montana</i>		1
Plantae	Flora	Fabaceae (Faboideae)	2880	<i>Hovea purpurea</i>		1
Plantae	Flora	Fabaceae (Faboideae)	HOVE	<i>Hovea spp.</i>		3

Plantae	Flora	Fabaceae (Faboideae)	7544	<i>Indigofera adesmiifolia</i>	Tick Indigo	1
Plantae	Flora	Fabaceae (Faboideae)	2882	<i>Indigofera australis</i>	Australian Indigo	3
Plantae	Flora	Fabaceae (Faboideae)	2919	<i>Medicago lupulina</i>	* Black Medic	13
Plantae	Flora	Fabaceae (Faboideae)	MEDI	<i>Medicago spp.</i>	*	3
Plantae	Flora	Fabaceae (Faboideae)	2935	<i>Mirbelia oxylobioides</i>	Mountain Mirbelia	18
Plantae	Flora	Fabaceae (Faboideae)	2948	<i>Oxylobium arborescens</i>	Tall Shaggy Pea	3
Plantae	Flora	Fabaceae (Faboideae)	2961	<i>Platylobium formosum</i>		21
Plantae	Flora	Fabaceae (Faboideae)	9354	<i>Platylobium formosum</i> <i>subsp. formosum</i>		34
Plantae	Flora	Fabaceae (Faboideae)	10706	<i>Podolobium alpestre</i>	Alpine Shaggy Pea	3
Plantae	Flora	Fabaceae (Faboideae)	10707	<i>Podolobium</i> <i>procumbens</i>	Trailing Shaggy Pea	1
Plantae	Flora	Fabaceae (Faboideae)	2991	<i>Pultenaea fasciculata</i>		1
Plantae	Flora	Fabaceae (Faboideae)	2994	<i>Pultenaea foliolosa</i>		1
Plantae	Flora	Fabaceae (Faboideae)	2999	<i>Pultenaea juniperina</i>		1
Plantae	Flora	Fabaceae (Faboideae)	3003	<i>Pultenaea microphylla</i>		1
Plantae	Flora	Fabaceae (Faboideae)	3011	<i>Pultenaea polifolia</i>	Dusky Bush-pea	3
Plantae	Flora	Fabaceae (Faboideae)	3012	<i>Pultenaea procumbens</i>		1
Plantae	Flora	Fabaceae (Faboideae)	11810	<i>Pultenaea setulosa</i>		5
Plantae	Flora	Fabaceae (Faboideae)	3017	<i>Pultenaea spinosa</i>		6

Plantae	Flora	Fabaceae (Faboideae)	PULT	<i>Pultenaea spp.</i>		1
Plantae	Flora	Fabaceae (Faboideae)	3025	<i>Pultenaea vrolandii</i>		1
Plantae	Flora	Fabaceae (Faboideae)	3041	<i>Swainsona galegifolia</i>	Smooth Darling Pea	2
Plantae	Flora	Fabaceae (Faboideae)	SWAI	<i>Swainsona spp.</i>		1
Plantae	Flora	Fabaceae (Faboideae)	3072	<i>Trifolium angustifolium</i>	* Narrow-leaved Clover	2
Plantae	Flora	Fabaceae (Faboideae)	3073	<i>Trifolium arvense</i>	* Haresfoot Clover	7
Plantae	Flora	Fabaceae (Faboideae)	3074	<i>Trifolium campestre</i>	* Hop Clover	7
Plantae	Flora	Fabaceae (Faboideae)	3076	<i>Trifolium dubium</i>	* Yellow Suckling Clover	3
Plantae	Flora	Fabaceae (Faboideae)	3084	<i>Trifolium pratense</i>	* Red Clover	2
Plantae	Flora	Fabaceae (Faboideae)	3085	<i>Trifolium repens</i>	* White Clover	27
Plantae	Flora	Fabaceae (Faboideae)	TRIF	<i>Trifolium spp.</i>	*	1
Plantae	Flora	Fabaceae (Mimosoideae)	3702	<i>Acacia alpina</i>	Alpine Wattle	3
Plantae	Flora	Fabaceae (Mimosoideae)	6691	<i>Acacia buxifolia subsp. buxifolia</i>	Box-leaved Wattle	1
Plantae	Flora	Fabaceae (Mimosoideae)	3758	<i>Acacia dealbata</i>	Silver Wattle	30
Plantae	Flora	Fabaceae (Mimosoideae)	11006	<i>Acacia dealbata subsp. dealbata</i>	Silver Wattle	3
Plantae	Flora	Fabaceae (Mimosoideae)	11007	<i>Acacia dealbata subsp. subalpina</i>	Silver Wattle	6
Plantae	Flora	Fabaceae (Mimosoideae)	3761	<i>Acacia decora</i>	Western Silver Wattle	1
Plantae	Flora	Fabaceae (Mimosoideae)	3781	<i>Acacia genistifolia</i>	Early Wattle	1
Plantae	Flora	Fabaceae (Mimosoideae)	3792	<i>Acacia implexa</i>	Hickory Wattle	5

Plantae	Flora	Fabaceae (Mimosoideae)	3824	<i>Acacia melanoxylon</i>	Blackwood	29
Plantae	Flora	Fabaceae (Mimosoideae)	3837	<i>Acacia obliquinervia</i>	Mountain Hickory	7
Plantae	Flora	Fabaceae (Mimosoideae)	3849	<i>Acacia penninervis</i>	Mountain Hickory	2
Plantae	Flora	Fabaceae (Mimosoideae)	3856	<i>Acacia pravissima</i>	Wedge-leaved Wattle	34
Plantae	Flora	Fabaceae (Mimosoideae)	3869	<i>Acacia rubida</i>	Red-stemmed Wattle	10
Plantae	Flora	Fabaceae (Mimosoideae)	3876	<i>Acacia siculiformis</i>	Dagger Wattle	12
Plantae	Flora	Fabaceae (Mimosoideae)	ACAC	<i>Acacia spp.</i>	Wattle	1
Plantae	Flora	Fabaceae (Mimosoideae)	3893	<i>Acacia ulicifolia</i>	Prickly Moses	5
Plantae	Flora	Gentianaceae	3131	<i>Centaurium erythraea</i> *	Common Centaury	31
Plantae	Flora	Gentianaceae	CENA	<i>Centaurium spp.</i> *		3
Plantae	Flora	Gentianaceae	3133	<i>Centaurium tenuiflorum</i> *	Branched Centaury, Slender centaury	4
Plantae	Flora	Gentianaceae	3135	<i>Cicendia quadrangularis</i> *		1
Plantae	Flora	Gentianaceae	GENL	<i>Gentianella spp.</i>		1
Plantae	Flora	Geraniaceae	3145	<i>Erodium moschatum</i> *	Musky Crowfoot	1
Plantae	Flora	Geraniaceae	3146	<i>Geranium antrorsum</i>		6
Plantae	Flora	Geraniaceae	15165	<i>Geranium brevicale</i>		1
Plantae	Flora	Geraniaceae	3151	<i>Geranium obtusisepalum</i>		2
Plantae	Flora	Geraniaceae	3152	<i>Geranium potentilloides</i>		6
Plantae	Flora	Geraniaceae	6438	<i>Geranium potentilloides</i> <i>var. abditum</i>		1
Plantae	Flora	Geraniaceae	7107	<i>Geranium potentilloides</i> <i>var. potentilloides</i>		6
Plantae	Flora	Geraniaceae	3154	<i>Geranium retrorsum</i>	Cranesbill Geranium	2
Plantae	Flora	Geraniaceae	3156	<i>Geranium solanderi</i>	Native Geranium	35
Plantae	Flora	Geraniaceae	8226	<i>Geranium solanderi var.</i> <i>solanderi</i>		7

Plantae	Flora	Geraniaceae	GERA	<i>Geranium spp.</i>		6
Plantae	Flora	Goodeniaceae	1863	<i>Brunonia australis</i>	Blue Pincushion	1
Plantae	Flora	Goodeniaceae	3188	<i>Goodenia hederacea</i>	Ivy Goodenia	2
Plantae	Flora	Goodeniaceae	7958	<i>Goodenia hederacea</i> <i>subsp. alpestris</i>		7
Plantae	Flora	Haloragaceae	3243	<i>Gonocarpus micranthus</i>		1
Plantae	Flora	Haloragaceae	8649	<i>Gonocarpus micranthus</i> <i>subsp. micranthus</i>		1
Plantae	Flora	Haloragaceae	3244	<i>Gonocarpus montanus</i>		3
Plantae	Flora	Haloragaceae	3247	<i>Gonocarpus tetragynus</i>	Poverty Raspwort	41
Plantae	Flora	Haloragaceae	3248	<i>Gonocarpus teucrioides</i>	Germander Raspwort	2
Plantae	Flora	Haloragaceae	3252	<i>Haloragis heterophylla</i>	Variable Raspwort	4
Plantae	Flora	Hypoxidaceae	3553	<i>Hypoxis hygrometrica</i>	Golden Weather- grass	2
Plantae	Flora	Hypoxidaceae	7574	<i>Hypoxis hygrometrica</i> <i>var. splendida</i>		1
Plantae	Flora	Hypoxidaceae	7561	<i>Hypoxis hygrometrica</i> <i>var. villosisepala</i>		1
Plantae	Flora	Hypoxidaceae	6879	<i>Hypoxis vaginata</i> <i>var.</i> <i>vaginata</i>		1
Plantae	Flora	Juncaceae	9311	<i>Juncus acutus</i> <i>subsp.</i> * <i>acutus</i>	Sharp Rush	1
Plantae	Flora	Juncaceae	10309	<i>Juncus alexandri</i> <i>subsp.</i> <i>alexandri</i>		1
Plantae	Flora	Juncaceae	3317	<i>Juncus australis</i>	Rush	2
Plantae	Flora	Juncaceae	9035	<i>Juncus brevibracteus</i>		2
Plantae	Flora	Juncaceae	3328	<i>Juncus falcatus</i>		2
Plantae	Flora	Juncaceae	3329	<i>Juncus filicaulis</i>		1
Plantae	Flora	Juncaceae	3347	<i>Juncus sarophorus</i>		4
Plantae	Flora	Juncaceae	JUNC	<i>Juncus spp.</i>		8

Plantae	Flora	Juncaceae	3356	<i>Luzula densiflora</i>	Woodrush	7
Plantae	Flora	Juncaceae	3357	<i>Luzula flaccida</i>	Woodrush	23
Plantae	Flora	Juncaceae	3359	<i>Luzula meridionalis</i>		2
Plantae	Flora	Juncaceae	8567	<i>Luzula modesta</i>		1
Plantae	Flora	Juncaceae	3361	<i>Luzula ovata</i>		2
Plantae	Flora	Juncaceae	LUZU	<i>Luzula spp.</i>		3
Plantae	Flora	Lamiaceae	3371	<i>Ajuga australis</i>	Austral Bugle	10
Plantae	Flora	Lamiaceae	3381	<i>Marrubium vulgare</i>	* White Horehound	2
Plantae	Flora	Lamiaceae	3384	<i>Mentha diemenica</i>	Slender Mint	1
Plantae	Flora	Lamiaceae	3385	<i>Mentha laxiflora</i>	Forest Mint	3
Plantae	Flora	Lamiaceae	3415	<i>Prostanthera lasianthos</i>	Victorian Christmas Bush	3
Plantae	Flora	Lamiaceae	3427	<i>Prostanthera rotundifolia</i>	Round-leaved Mint-bush	5
Plantae	Flora	Lamiaceae	3440	<i>Prunella vulgaris</i>	* Self-heal	4
Plantae	Flora	Lamiaceae	3447	<i>Scutellaria humilis</i>	Dwarf Skullcap	1
Plantae	Flora	Lamiaceae	3458	<i>Westringia eremicola</i>	Slender Westringia	1
Plantae	Flora	Lamiaceae	3462	<i>Westringia lucida</i>	Shining Westringia	1
Plantae	Flora	Lauraceae	3467	<i>Cassytha glabella</i>		2
Plantae	Flora	Lauraceae	3468	<i>Cassytha melantha</i>		1
Plantae	Flora	Lauraceae	3469	<i>Cassytha pubescens</i>	Downy Dodder-laurel	2
Plantae	Flora	Linaceae	3583	<i>Linum marginale</i>	Native Flax	3
Plantae	Flora	Lomandraceae	6295	<i>Lomandra bracteata</i>	Mat-rush	12
Plantae	Flora	Lomandraceae	6302	<i>Lomandra filiformis</i>	Wattle Matt-rush	1
Plantae	Flora	Lomandraceae	6511	<i>Lomandra filiformis subsp. coriacea</i>	Wattle Matt-rush	24
Plantae	Flora	Lomandraceae	7931	<i>Lomandra filiformis subsp. filiformis</i>		15
Plantae	Flora	Lomandraceae	6308	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	46
Plantae	Flora	Lomandraceae	8802	<i>Lomandra multiflora subsp. multiflora</i>	Many-flowered Mat-rush	9

Plantae	Flora	Lomandraceae	LOMA	<i>Lomandra spp.</i>	Mat-rush	3
Plantae	Flora	Loranthaceae	7922	<i>Amyema miraculosum</i> <i>subsp. boormanii</i>		1
Plantae	Flora	Loranthaceae	7308	<i>Amyema pendula subsp.</i> <i>pendula</i>		2
Plantae	Flora	Malaceae	5612	<i>Cotoneaster</i> <i>glaucophyllus</i>	*	1
Plantae	Flora	Malaceae	COTO	<i>Cotoneaster spp.</i>	*	1
Plantae	Flora	Malaceae	5616	<i>Crataegus monogyna</i>	* Hawthorn	3
Plantae	Flora	Malaceae	13197	<i>Crataegus monogyna</i> <i>subsp. monogyna</i>	*	1
Plantae	Flora	Malaceae	MALU	<i>Malus spp.</i>	*	1
Plantae	Flora	Malvaceae	6128	<i>Brachychiton populneus</i>	Kurrajong	3
Plantae	Flora	Malvaceae	9175	<i>Lasiopetalum</i> <i>ferrugineum var.</i> <i>cordatum</i>		2
Plantae	Flora	Myrtaceae	4000	<i>Baeckea utilis</i>	Mountain Baeckea	11
Plantae	Flora	Myrtaceae	4011	<i>Callistemon pallidus</i>	Lemon Bottlebrush	1
Plantae	Flora	Myrtaceae	7943	<i>Callistemon pityoides</i>	Alpine Bottlebrush	1
Plantae	Flora	Myrtaceae	4017	<i>Callistemon sieberi</i>	River Bottlebrush	1
Plantae	Flora	Myrtaceae	4021	<i>Calytrix tetragona</i>	Common Fringe- myrtle	2
Plantae	Flora	Myrtaceae	8450	<i>Eucalyptus bicostata</i>	Eurabbie	7
Plantae	Flora	Myrtaceae	4061	<i>Eucalyptus bridgesiana</i>	Apple Box	4
Plantae	Flora	Myrtaceae	4068	<i>Eucalyptus camphora</i>	Broad-leaved Sally	5
Plantae	Flora	Myrtaceae	9974	<i>Eucalyptus camphora</i> <i>subsp. humeana</i>		7
Plantae	Flora	Myrtaceae	4076	<i>Eucalyptus</i> <i>dalrympleana</i>	Mountain Gum	65
Plantae	Flora	Myrtaceae	7309	<i>Eucalyptus</i> <i>dalrympleana subsp.</i> <i>dalrympleana</i>		46
Plantae	Flora	Myrtaceae	9970	<i>Eucalyptus debeuzevillei</i>		8
Plantae	Flora	Myrtaceae	6885	<i>Eucalyptus delegatensis</i> <i>subsp. delegatensis</i>		30

Plantae	Flora	Myrtaceae	4082	<i>Eucalyptus dives</i>	Broad-leaved Peppermint	23
Plantae	Flora	Myrtaceae	4095	<i>Eucalyptus glaucescens</i>	Tingiringi Gum	3
Plantae	Flora	Myrtaceae	4120	<i>Eucalyptus macrorhyncha</i>	Red Stringybark	23
Plantae	Flora	Myrtaceae	4122	<i>Eucalyptus mannifera</i>	Brittle Gum	9
Plantae	Flora	Myrtaceae	7827	<i>Eucalyptus mannifera</i> subsp. <i>mannifera</i>	Brittle Gum	7
Plantae	Flora	Myrtaceae	4137	<i>Eucalyptus nortonii</i>	Large-flowered Bundy	10
Plantae	Flora	Myrtaceae	4146	<i>Eucalyptus ovata</i>	Swamp Gum	1
Plantae	Flora	Myrtaceae	4151	<i>Eucalyptus pauciflora</i>	White Sally	98
Plantae	Flora	Myrtaceae	4169	<i>Eucalyptus radiata</i>	Narrow-leaved Peppermint	8
Plantae	Flora	Myrtaceae	7338	<i>Eucalyptus radiata</i> subsp. <i>radiata</i>		1
Plantae	Flora	Myrtaceae	9950	<i>Eucalyptus robertsonii</i>	Robertson's Peppermint	17
Plantae	Flora	Myrtaceae	9951	<i>Eucalyptus robertsonii</i> subsp. <i>robertsonii</i>		43
Plantae	Flora	Myrtaceae	4173	<i>Eucalyptus rubida</i>	Candlebark	19
Plantae	Flora	Myrtaceae	9750	<i>Eucalyptus rubida</i> subsp. <i>rubida</i>		11
Plantae	Flora	Myrtaceae	4187	<i>Eucalyptus stellulata</i>	Black Sally	35
Plantae	Flora	Myrtaceae	4197	<i>Eucalyptus viminalis</i>	Ribbon Gum	16
Plantae	Flora	Myrtaceae	13286	<i>Eucalyptus viminalis</i> subsp. <i>luxurians</i>		1
Plantae	Flora	Myrtaceae	11667	<i>Euryomyrtus denticulata</i>		1
Plantae	Flora	Myrtaceae	4207	<i>Kunzea capitata</i>	P	1
Plantae	Flora	Myrtaceae	4209	<i>Kunzea muelleri</i>		1
Plantae	Flora	Myrtaceae	4211	<i>Kunzea parvifolia</i>	Violet Kunzea	1
Plantae	Flora	Myrtaceae	4216	<i>Leptospermum brevipes</i>	Slender Tea-tree	4
Plantae	Flora	Myrtaceae	7766	<i>Leptospermum grandifolium</i>	Woolly Teatree	9

Plantae	Flora	Myrtaceae	4221	<i>Leptospermum juniperinum</i>	Prickly Tea-tree		1
Plantae	Flora	Myrtaceae	4223	<i>Leptospermum lanigerum</i>	Woolly Teatree	P	4
Plantae	Flora	Myrtaceae	4226	<i>Leptospermum micromyrtus</i>	Button Tea-tree		1
Plantae	Flora	Myrtaceae	4230	<i>Leptospermum myrtifolium</i>			12
Plantae	Flora	Myrtaceae	4232	<i>Leptospermum obovatum</i>			1
Plantae	Flora	Myrtaceae	8486	<i>Leptospermum trinervium</i>	Slender Tea-tree		3
Plantae	Flora	Oleaceae	LIGU	<i>Ligustrum spp.</i>		*	1
Plantae	Flora	Oleaceae	4314	<i>Ligustrum vulgare</i>	European Privet	*	1
Plantae	Flora	Onagraceae	4326	<i>Epilobium billardierianum</i>			5
Plantae	Flora	Onagraceae	7952	<i>Epilobium billardierianum subsp. cinereum</i>			10
Plantae	Flora	Onagraceae	7605	<i>Epilobium billardierianum subsp. hydrophilum</i>			1
Plantae	Flora	Onagraceae	4327	<i>Epilobium ciliatum</i>		*	1
Plantae	Flora	Onagraceae	4329	<i>Epilobium gunnianum</i>	Gunn's Willow-herb		3
Plantae	Flora	Onagraceae	4330	<i>Epilobium hirtigerum</i>			2
Plantae	Flora	Onagraceae	EPIL	<i>Epilobium spp.</i>			7
Plantae	Flora	Onagraceae	7375	<i>Ludwigia peploides subsp. montevidensis</i>	Water Primrose		1
Plantae	Flora	Orchidaceae	ACIA	<i>Acianthus spp.</i>	Mosquito Orchid	P	1
Plantae	Flora	Orchidaceae	10712	<i>Caladenia alpina</i>		P	1
Plantae	Flora	Orchidaceae	4376	<i>Caladenia cucullata</i>	Hooded Caladenia	P	3
Plantae	Flora	Orchidaceae	9123	<i>Caladenia gracilis</i>	Musky Caladenia	P	7
Plantae	Flora	Orchidaceae	CALA	<i>Caladenia spp.</i>		P	2
Plantae	Flora	Orchidaceae	CALO	<i>Calochilus spp.</i>		P	1

Plantae	Flora	Orchidaceae	8946	<i>Chiloglottis pluricallata</i>		P	1
Plantae	Flora	Orchidaceae	CHIL	<i>Chiloglottis spp.</i>		P	1
Plantae	Flora	Orchidaceae	10289	<i>Chiloglottis valida</i>	Large Bird Orchid	P	7
Plantae	Flora	Orchidaceae	CORY	<i>Corybas spp.</i>		P	7
Plantae	Flora	Orchidaceae	7887	<i>Dipodium punctatum</i>		P	1
Plantae	Flora	Orchidaceae	DIPO	<i>Dipodium spp.</i>		P	3
Plantae	Flora	Orchidaceae	4447	<i>Diuris maculata</i>	Spotted Doubletail	P	1
Plantae	Flora	Orchidaceae	DIUR	<i>Diuris spp.</i>		P	1
Plantae	Flora	Orchidaceae	4456	<i>Diuris sulphurea</i>	Tiger Orchid	P	3
Plantae	Flora	Orchidaceae	4463	<i>Gastrodia sesamoides</i>	Cinnamon Bells	P	2
Plantae	Flora	Orchidaceae	GASR	<i>Gastrodia spp.</i>		P	1
Plantae	Flora	Orchidaceae	4465	<i>Glossodia major</i>	Waxlip Orchid	P	1
Plantae	Flora	Orchidaceae	7622	<i>Microtis parviflora</i>	Slender Onion Orchid	P	3
Plantae	Flora	Orchidaceae	MICO	<i>Microtis spp.</i>		P	1
Plantae	Flora	Orchidaceae	4473	<i>Microtis unifolia</i>	Common Onion Orchid	P	11
Plantae	Flora	Orchidaceae	10711	<i>Prasophyllum tadgellianum</i>		P	1
Plantae	Flora	Orchidaceae	7854	<i>Pterostylis aestiva</i>	Long-tongue Summer Greenhood	P	1
Plantae	Flora	Orchidaceae	4554	<i>Pterostylis grandiflora</i>	Cobra Greenhood	P	1
Plantae	Flora	Orchidaceae	4559	<i>Pterostylis longifolia</i>	Tall Greenhood	P	1
Plantae	Flora	Orchidaceae	11030	<i>Pterostylis monticola</i>	Mountain Greenhood	P	4
Plantae	Flora	Orchidaceae	PTER	<i>Pterostylis spp.</i>	Greenhood	P	5
Plantae	Flora	Orchidaceae	13366	<i>Thelymitra alpina</i>		P	1
Plantae	Flora	Orchidaceae	7365	<i>Thelymitra cyanea</i>	Veined Sun Orchid	P	2
Plantae	Flora	Orchidaceae	4601	<i>Thelymitra nuda</i>	Plain Sun Orchid	P	4
Plantae	Flora	Orchidaceae	THEL	<i>Thelymitra spp.</i>		P	1
Plantae	Flora	Orobanchaceae	5956	<i>Euphrasia caudata</i>			1
Plantae	Flora	Orobanchaceae	7778	<i>Euphrasia collina subsp. paludosa</i>	Eyebright		2

Plantae	Flora	Orobanchaceae	5961	<i>Euphrasia scabra</i>	Rough Eyebright	E1, 3	2
Plantae	Flora	Orobanchaceae	EUPH	<i>Euphrasia spp.</i>			1
Plantae	Flora	Oxalidaceae	4613	<i>Oxalis corniculata</i> *	Creeping Oxalis		1
Plantae	Flora	Oxalidaceae	4621	<i>Oxalis perennans</i>			7
Plantae	Flora	Oxalidaceae	OXAL	<i>Oxalis spp.</i>			1
Plantae	Flora	Phormiaceae	3540	<i>Dianella caerulea</i>	Blue Flax-lily		1
Plantae	Flora	Phormiaceae	6700	<i>Dianella caerulea var. caerulea</i>			2
Plantae	Flora	Phormiaceae	7783	<i>Dianella longifolia</i>	Blueberry Lily		1
Plantae	Flora	Phormiaceae	8725	<i>Dianella longifolia var. longifolia</i>			3
Plantae	Flora	Phormiaceae	3542	<i>Dianella revoluta</i>	Blueberry Lily		15
Plantae	Flora	Phormiaceae	7580	<i>Dianella revoluta var. revoluta</i>			2
Plantae	Flora	Phormiaceae	DIAN	<i>Dianella spp.</i>			3
Plantae	Flora	Phormiaceae	3543	<i>Dianella tasmanica</i>			13
Plantae	Flora	Phrymaceae	5984	<i>Mimulus moschatus</i> *	Musk Monkey-flower		1
Plantae	Flora	Phyllanthaceae	7395	<i>Poranthera microphylla</i>	Small Poranthera		48
Plantae	Flora	Phyllanthaceae	PORA	<i>Poranthera spp.</i>			1
Plantae	Flora	Pinaceae	PINU	<i>Pinus spp.</i> *			2
Plantae	Flora	Pinaceae	11972	<i>Pinus sylvestris</i> *	Scotch pine		1
Plantae	Flora	Pittosporaceae	4671	<i>Billardiera scandens</i>	Hairy Apple Berry		3
Plantae	Flora	Pittosporaceae	11017	<i>Bursaria spinosa subsp. lasiophylla</i>	Native Blackthorn		5
Plantae	Flora	Pittosporaceae	11018	<i>Bursaria spinosa subsp. spinosa</i>	Native Blackthorn		7
Plantae	Flora	Pittosporaceae	8809	<i>Rhytidosporum alpinum</i>			3
Plantae	Flora	Plantaginaceae	5974	<i>Linaria arvensis</i> *			1
Plantae	Flora	Plantaginaceae	4686	<i>Plantago alpestris</i>			1
Plantae	Flora	Plantaginaceae	4687	<i>Plantago antarctica</i>			1
Plantae	Flora	Plantaginaceae	4691	<i>Plantago debilis</i>	Shade Plantain		2
Plantae	Flora	Plantaginaceae	4694	<i>Plantago gaudichaudii</i>	Narrow Plantain		3
Plantae	Flora	Plantaginaceae	4699	<i>Plantago lanceolata</i> *	Lamb's Tongues		8

Plantae	Flora	Plantaginaceae	PLAA	<i>Plantago spp.</i>	Plantain	1
Plantae	Flora	Plantaginaceae	4705	<i>Plantago varia</i>		5
Plantae	Flora	Plantaginaceae	6002	<i>Veronica arvensis</i>	* Wall Speedwell	2
Plantae	Flora	Plantaginaceae	6003	<i>Veronica calycina</i>	Hairy Speedwell	19
Plantae	Flora	Plantaginaceae	14262	<i>Veronica derwentiana</i>		4
Plantae	Flora	Plantaginaceae	13395	<i>Veronica derwentiana</i> <i>subsp. derwentiana</i>		13
Plantae	Flora	Plantaginaceae	13396	<i>Veronica derwentiana</i> <i>subsp. maideniana</i>		8
Plantae	Flora	Plantaginaceae	6004	<i>Veronica gracilis</i>		1
Plantae	Flora	Plantaginaceae	13401	<i>Veronica perfoliata</i>	Digger's Speedwell	1
Plantae	Flora	Plantaginaceae	VERO	<i>Veronica spp.</i>		1
Plantae	Flora	Plantaginaceae	13406	<i>Veronica subtilis</i>		4
Plantae	Flora	Poaceae	11263	<i>Agrostis bettyae</i>		1
Plantae	Flora	Poaceae	4721	<i>Agrostis capillaris</i>	* Browntop Bent	3
Plantae	Flora	Poaceae	4730	<i>Aira caryophyllea</i>	* Silvery Hairgrass	1
Plantae	Flora	Poaceae	4731	<i>Aira cupaniana</i>	* Silvery Hairgrass	1
Plantae	Flora	Poaceae	6547	<i>Aira elegantissima</i>	* Delicate Hairgrass	4
Plantae	Flora	Poaceae	6842	<i>Amphibromus nervosus</i>	Swamp Wallaby Grass	1
Plantae	Flora	Poaceae	14896	<i>Anthosachne scabra</i>	Wheatgrass, Common Wheatgrass	27
Plantae	Flora	Poaceae	4750	<i>Anthoxanthum</i> <i>odoratum</i>	* Sweet Vernal Grass	5
Plantae	Flora	Poaceae	4770	<i>Aristida ramosa</i>	Purple Wiregrass	1
Plantae	Flora	Poaceae	6594	<i>Austrofestuca littoralis</i>	Beach Fescue	1
Plantae	Flora	Poaceae	10395	<i>Austrostipa densiflora</i>	Foxtail Speargrass	2
Plantae	Flora	Poaceae	10396	<i>Austrostipa rudis</i>		1
Plantae	Flora	Poaceae	10398	<i>Austrostipa rudis subsp.</i> <i>nervosa</i>		5
Plantae	Flora	Poaceae	10377	<i>Austrostipa scabra</i>	Speargrass	2
Plantae	Flora	Poaceae	AUSO	<i>Austrostipa spp.</i>		2
Plantae	Flora	Poaceae	4780	<i>Avena fatua</i>	* Wild Oats	2

Plantae	Flora	Poaceae	4790	<i>Bothriochloa macra</i>	Red Grass	1
Plantae	Flora	Poaceae	4800	<i>Briza maxima</i>	* Quaking Grass	2
Plantae	Flora	Poaceae	4801	<i>Briza minor</i>	* Shivery Grass	3
Plantae	Flora	Poaceae	4807	<i>Bromus hordeaceus</i>	* Soft Brome	2
Plantae	Flora	Poaceae	14903	<i>Cenchrus clandestinus</i>	* Kikuyu Grass	1
Plantae	Flora	Poaceae	4831	<i>Chloris gayana</i>	* Rhodes Grass	1
Plantae	Flora	Poaceae	4833	<i>Chloris truncata</i>	Windmill Grass	1
Plantae	Flora	Poaceae	6540	<i>Cynodon dactylon</i>	Common Couch	2
Plantae	Flora	Poaceae	4846	<i>Dactylis glomerata</i>	* Cocksfoot	6
Plantae	Flora	Poaceae	4871	<i>Deyeuxia accedens</i>		1
Plantae	Flora	Poaceae	4877	<i>Deyeuxia brachyathera</i>		3
Plantae	Flora	Poaceae	4878	<i>Deyeuxia carinata</i>		1
Plantae	Flora	Poaceae	4883	<i>Deyeuxia gunniana</i>		1
Plantae	Flora	Poaceae	4888	<i>Deyeuxia monticola</i>		7
Plantae	Flora	Poaceae	6940	<i>Deyeuxia monticola var. monticola</i>		3
Plantae	Flora	Poaceae	4891	<i>Deyeuxia quadriseta</i>		7
Plantae	Flora	Poaceae	4893	<i>Deyeuxia rodwayi</i>		1
Plantae	Flora	Poaceae	4897	<i>Dichelachne crinita</i>	Longhair Plumegrass	4
Plantae	Flora	Poaceae	9967	<i>Dichelachne hirtella</i>	Plumegrass	5
Plantae	Flora	Poaceae	8748	<i>Dichelachne inaequiglumis</i>		9
Plantae	Flora	Poaceae	4898	<i>Dichelachne micrantha</i>	Shorthair Plumegrass	5
Plantae	Flora	Poaceae	8767	<i>Dichelachne parva</i>		4
Plantae	Flora	Poaceae	4899	<i>Dichelachne rara</i>		14
Plantae	Flora	Poaceae	9151	<i>Dichelachne sieberiana</i>		6
Plantae	Flora	Poaceae	DICE	<i>Dichelachne spp.</i>		8
Plantae	Flora	Poaceae	4929	<i>Echinopogon caespitosus</i>	Bushy Hedgehog-grass	1

Plantae	Flora	Poaceae	7593	<i>Echinopogon caespitosus</i> var. <i>caespitosus</i>	Tufted Hedgehog Grass	1
Plantae	Flora	Poaceae	4931	<i>Echinopogon intermedius</i>	Erect Hedgehog Grass	1
Plantae	Flora	Poaceae	4940	<i>Eleusine tristachya</i> *	Goose Grass	1
Plantae	Flora	Poaceae	6387	<i>Eragrostis cilianensis</i> *	Stinkgrass	1
Plantae	Flora	Poaceae	4952	<i>Eragrostis curvula</i> *	African Lovegrass	2
Plantae	Flora	Poaceae	4988	<i>Festuca asperula</i>	Graceful Fescue	1
Plantae	Flora	Poaceae	4992	<i>Festuca muelleri</i>		1
Plantae	Flora	Poaceae	4993	<i>Festuca pratensis</i> *	Meadow Fescue	1
Plantae	Flora	Poaceae	5005	<i>Holcus lanatus</i> *	Yorkshire Fog	31
Plantae	Flora	Poaceae	13831	<i>Hookerchloa eriopoda</i>	Snow Fescue	3
Plantae	Flora	Poaceae	7447	<i>Hookerchloa hookeriana</i>	Hooker's Fescue	1
Plantae	Flora	Poaceae	5012	<i>Hordeum leporinum</i> *	Barley Grass	1
Plantae	Flora	Poaceae	11394	<i>Lachnagrostis aemula</i>	Blowngrass	8
Plantae	Flora	Poaceae	11388	<i>Lachnagrostis filiformis</i>		3
Plantae	Flora	Poaceae	5032	<i>Lolium perenne</i> *	Perennial Ryegrass	1
Plantae	Flora	Poaceae	5037	<i>Microlaena stipoides</i>	Weeping Grass	4
Plantae	Flora	Poaceae	7707	<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass	10
Plantae	Flora	Poaceae	5055	<i>Panicum effusum</i>	Hairy Panic	8
Plantae	Flora	Poaceae	PANI	<i>Panicum</i> spp.	Panicum	1
Plantae	Flora	Poaceae	5086	<i>Paspalum dilatatum</i> *	Paspalum	2
Plantae	Flora	Poaceae	5101	<i>Pentapogon quadrifidus</i>	Fiveawn Speargrass	2
Plantae	Flora	Poaceae	5106	<i>Phalaris aquatica</i> *	Phalaris	2
Plantae	Flora	Poaceae	PHAA	<i>Phalaris</i> spp.		1
Plantae	Flora	Poaceae	5121	<i>Poa annua</i> *	Winter Grass	1

Plantae	Flora	Poaceae	5124	<i>Poa clivicola</i>	Fine-leaved Snowgrass	4
Plantae	Flora	Poaceae	5126	<i>Poa costiniana</i>	Bog Snowgrass	1
Plantae	Flora	Poaceae	5127	<i>Poa ensiformis</i>	Purple-sheathed Tussock-grass	3
Plantae	Flora	Poaceae	5130	<i>Poa helmsii</i>	Broad-leaved Snowgrass	16
Plantae	Flora	Poaceae	9948	<i>Poa hookeri</i>		2
Plantae	Flora	Poaceae	5132	<i>Poa induta</i>		2
Plantae	Flora	Poaceae	11196	<i>Poa labillardierei</i> var. <i>labillardierei</i>	Tussock	15
Plantae	Flora	Poaceae	5134	<i>Poa meionectes</i>		9
Plantae	Flora	Poaceae	5136	<i>Poa phillipsiana</i>		16
Plantae	Flora	Poaceae	5141	<i>Poa sieberiana</i>	Snowgrass	15
Plantae	Flora	Poaceae	8743	<i>Poa sieberiana</i> var. <i>cyanophylla</i>		23
Plantae	Flora	Poaceae	8744	<i>Poa sieberiana</i> var. <i>hirtella</i>		12
Plantae	Flora	Poaceae	8742	<i>Poa sieberiana</i> var. <i>sieberiana</i>	Snowgrass	89
Plantae	Flora	Poaceae	POA	<i>Poa</i> spp.		34
Plantae	Flora	Poaceae	5142	<i>Poa tenera</i>	Slender Tussock-grass	1
Plantae	Flora	Poaceae	POAC	<i>Poaceae indeterminate</i> *	Grasses, reeds and bamboos	1
Plantae	Flora	Poaceae	14311	<i>Rytidosperma laeve</i>	Wallaby Grass	3
Plantae	Flora	Poaceae	10638	<i>Rytidosperma nudiflorum</i>		1
Plantae	Flora	Poaceae	14314	<i>Rytidosperma pallidum</i>	Redanther Wallaby Grass; Silvertop Wallaby Grass	25
Plantae	Flora	Poaceae	14315	<i>Rytidosperma penicillatum</i>	Slender Wallaby Grass	23
Plantae	Flora	Poaceae	14316	<i>Rytidosperma pilosum</i>	Smooth-flowered Wallaby Grass	7

Plantae	Flora	Poaceae	10639	<i>Rytidosperma procerum</i>		1
Plantae	Flora	Poaceae	14317	<i>Rytidosperma racemosum</i>	Wallaby Grass	1
Plantae	Flora	Poaceae	14318	<i>Rytidosperma racemosum var. racemosum</i>	Wallaby Grass	5
Plantae	Flora	Poaceae	RYTI	<i>Rytidosperma spp.</i>		1
Plantae	Flora	Poaceae	5169	<i>Setaria verticillata</i>	* Whorled Pigeon Grass	1
Plantae	Flora	Poaceae	7770	<i>Themeda triandra</i>		39
Plantae	Flora	Poaceae	5239	<i>Vulpia bromoides</i>	* Squirrel Tail Fesque	2
Plantae	Flora	Poaceae	8516	<i>Vulpia muralis</i>	* Wall Fescue	1
Plantae	Flora	Polygalaceae	5255	<i>Comesperma retusum</i>		1
Plantae	Flora	Polygalaceae	5259	<i>Polygala japonica</i>	Dwarf Milkwort	2
Plantae	Flora	Polygonaceae	5265	<i>Acetosella vulgaris</i>	* Sheep Sorrel	25
Plantae	Flora	Polygonaceae	POLG	<i>Polygonum spp.</i>		1
Plantae	Flora	Polygonaceae	5296	<i>Rumex brownii</i>	Swamp Dock	3
Plantae	Flora	Polygonaceae	5298	<i>Rumex crispus</i>	* Curled Dock	1
Plantae	Flora	Polygonaceae	RUME	<i>Rumex spp.</i>	Dock	2
Plantae	Flora	Portulacaceae	7785	<i>Montia fontana subsp. chondrasperma</i>		1
Plantae	Flora	Portulacaceae	8731	<i>Neopaxia australasica</i>		1
Plantae	Flora	Potamogetonaceae	7023	<i>Potamogeton tricarinatus</i>	Floating Pondweed	1
Plantae	Flora	Primulaceae	14614	<i>Lysimachia arvensis</i>	* Scarlet Pimpernel	5
Plantae	Flora	Proteaceae	5340	<i>Banksia canei</i>	Mountain Banksia	8
Plantae	Flora	Proteaceae	5344	<i>Banksia marginata</i>	Silver Banksia	4
Plantae	Flora	Proteaceae	10769	<i>Grevillea arenaria subsp. canescens</i>	Hoary Grevillea	5
Plantae	Flora	Proteaceae	5377	<i>Grevillea juniperina</i>		1
Plantae	Flora	Proteaceae	5379	<i>Grevillea lanigera</i>	Woolly Grevillea	1
Plantae	Flora	Proteaceae	9963	<i>Grevillea oxyantha subsp. ecarinata</i>		2

Plantae	Flora	Proteaceae	5389	<i>Grevillea parviflora</i>			1
Plantae	Flora	Proteaceae	5391	<i>Grevillea polybractea</i>	Crimson Grevillea		2
Plantae	Flora	Proteaceae	10978	<i>Grevillea ramosissima</i> <i>subsp. ramosissima</i>	Fan Grevillea		1
Plantae	Flora	Proteaceae	5397	<i>Grevillea rosmarinifolia</i>	Rosemary Grevillea		7
Plantae	Flora	Proteaceae	10957	<i>Grevillea rosmarinifolia</i> <i>subsp. rosmarinifolia</i>	Rosemary Grevillea		11
Plantae	Flora	Proteaceae	10983	<i>Grevillea victoriae</i> <i>subsp. nivalis</i>			14
Plantae	Flora	Proteaceae	5418	<i>Hakea lissosperma</i>	Mountain Needlewood		3
Plantae	Flora	Proteaceae	5420	<i>Hakea microcarpa</i>	Small-fruited Hakea		18
Plantae	Flora	Proteaceae	HAKE	<i>Hakea spp.</i>			1
Plantae	Flora	Proteaceae	5442	<i>Lomatia fraseri</i>	Silky Lomatia		2
Plantae	Flora	Proteaceae	5444	<i>Lomatia myricoides</i>	River Lomatia		28
Plantae	Flora	Proteaceae	5452	<i>Persoonia chamaepeuce</i>		P	30
Plantae	Flora	Proteaceae	5463	<i>Persoonia linearis</i>	Narrow-leaved Geebung	P	1
Plantae	Flora	Pteridaceae	7997	<i>Adiantum aethiopicum</i>	Common Maidenhair	P	1
Plantae	Flora	Pteridaceae	8005	<i>Cheilanthes</i> <i>austrotenuifolia</i>	Rock Fern		5
Plantae	Flora	Pteridaceae	6382	<i>Cheilanthes distans</i>	Bristly Cloak Fern		1
Plantae	Flora	Pteridaceae	10439	<i>Cheilanthes sieberi</i>	Rock Fern		2
Plantae	Flora	Pteridaceae	8007	<i>Cheilanthes sieberi</i> <i>subsp. sieberi</i>	Rock Fern		4
Plantae	Flora	Pteridaceae	CHEI	<i>Cheilanthes spp.</i>	Cloak Fern, Mulga Fern, Rock Fern		1
Plantae	Flora	Pteridaceae	10488	<i>Pellaea nana</i>	Dwarf Sickle Fern		1
Plantae	Flora	Ranunculaceae	5493	<i>Clematis aristata</i>	Old Man's Beard		47
Plantae	Flora	Ranunculaceae	6903	<i>Clematis glycinoides</i> <i>var. glycinoides</i>			1
Plantae	Flora	Ranunculaceae	13520	<i>Clematis leptophylla</i>			4
Plantae	Flora	Ranunculaceae	5496	<i>Clematis microphylla</i>	Small-leaved Clematis		1

Plantae	Flora	Ranunculaceae	CLEM	<i>Clematis</i> spp.		1
Plantae	Flora	Ranunculaceae	5505	<i>Ranunculus graniticola</i>	Granite Buttercup	6
Plantae	Flora	Ranunculaceae	5508	<i>Ranunculus lappaceus</i>	Common Buttercup	36
Plantae	Flora	Ranunculaceae	5517	<i>Ranunculus pimpinellifolius</i>	Bog Buttercup	1
Plantae	Flora	Ranunculaceae	5518	<i>Ranunculus plebeius</i>	Forest Buttercup	2
Plantae	Flora	Ranunculaceae	9637	<i>Ranunculus scapiger</i>		11
Plantae	Flora	Ranunculaceae	5525	<i>Ranunculus sessiliflorus</i>	Small-flowered Buttercup	2
Plantae	Flora	Ranunculaceae	RANU	<i>Ranunculus</i> spp.		5
Plantae	Flora	Restionaceae	5532	<i>Empodisma minus</i>		3
Plantae	Flora	Restionaceae	REST	<i>Restio</i> spp.		1
Plantae	Flora	Rhamnaceae	8611	<i>Cryptandra amara</i> var. <i>amara</i>		1
Plantae	Flora	Rhamnaceae	5563	<i>Discaria nitida</i>	Leafy Anchor Plant	V 2
Plantae	Flora	Rhamnaceae	5564	<i>Discaria pubescens</i>	Australian Anchor Plant	18
Plantae	Flora	Rhamnaceae	5600	<i>Spyridium parvifolium</i>	Dusty Miller	4
Plantae	Flora	Rosaceae	5602	<i>Acaena agnipila</i>	Hairy Sheep's Burr	2
Plantae	Flora	Rosaceae	12513	<i>Acaena anserovina</i>		1
Plantae	Flora	Rosaceae	5603	<i>Acaena echinata</i>	Sheep's Burr	6
Plantae	Flora	Rosaceae	5604	<i>Acaena novae-zelandiae</i>	Bidgee-widgee	41
Plantae	Flora	Rosaceae	5605	<i>Acaena ovina</i>	Acaena	12
Plantae	Flora	Rosaceae	9704	<i>Acaena</i> sp. A		4
Plantae	Flora	Rosaceae	ACAE	<i>Acaena</i> spp.	Sheep's Burr	2
Plantae	Flora	Rosaceae	5608	<i>Aphanes arvensis</i>	* Parsley-piert	1
Plantae	Flora	Rosaceae	5619	<i>Geum urbanum</i>	Herb Bennet	3
Plantae	Flora	Rosaceae	5621	<i>Potentilla recta</i>	*	10
Plantae	Flora	Rosaceae	5635	<i>Rosa rubiginosa</i>	* Sweet Briar	26
Plantae	Flora	Rosaceae	11733	<i>Rubus anglocandicans</i>	* Blackberry	14

Plantae	Flora	Rosaceae	11303	<i>Rubus fruticosus sp. agg.</i>	*	Blackberry complex	11
Plantae	Flora	Rosaceae	5642	<i>Rubus parvifolius</i>		Native Raspberry	25
Plantae	Flora	Rosaceae	RUBU	<i>Rubus spp.</i>			5
Plantae	Flora	Rosaceae	5646	<i>Rubus ulmifolius</i>	*	Blackberry	7
Plantae	Flora	Rosaceae	7431	<i>Sanguisorba minor subsp. muricata</i>	*	Sheep's Burnet	1
Plantae	Flora	Rubiaceae	5653	<i>Asperula conferta</i>		Common Woodruff	32
Plantae	Flora	Rubiaceae	5657	<i>Asperula gunnii</i>		Mountain Woodruff	1
Plantae	Flora	Rubiaceae	5658	<i>Asperula pusilla</i>		Alpine Woodruff	1
Plantae	Flora	Rubiaceae	5659	<i>Asperula scoparia</i>		Prickly Woodruff	69
Plantae	Flora	Rubiaceae	ASPE	<i>Asperula spp.</i>		Woodruff	2
Plantae	Flora	Rubiaceae	5670	<i>Coprosma hirtella</i>		Coffee-berry	32
Plantae	Flora	Rubiaceae	5675	<i>Coprosma quadrifida</i>		Prickly Currant Bush	4
Plantae	Flora	Rubiaceae	5681	<i>Galium binifolium</i>			1
Plantae	Flora	Rubiaceae	5682	<i>Galium ciliare</i>			2
Plantae	Flora	Rubiaceae	5684	<i>Galium gaudichaudii</i>		Rough Bedstraw	15
Plantae	Flora	Rubiaceae	13838	<i>Galium leiocarpum</i>			2
Plantae	Flora	Rubiaceae	5686	<i>Galium migrans</i>			3
Plantae	Flora	Rubiaceae	5688	<i>Galium propinquum</i>		Maori Bedstraw	2
Plantae	Flora	Rubiaceae	GALI	<i>Galium spp.</i>			1
Plantae	Flora	Rubiaceae	5703	<i>Pomax umbellata</i>		Pomax	4
Plantae	Flora	Rutaceae	5730	<i>Asterolasia trymalioides</i>		Alpine Starbush	1
Plantae	Flora	Rutaceae	9271	<i>Phebalium squamulosum subsp. ozothamnoides</i>		Alpine Phebalium	P 1
Plantae	Flora	Salicaceae	POPU	<i>Populus spp.</i>	*		1
Plantae	Flora	Santalaceae	5860	<i>Exocarpos cupressiformis</i>		Cherry Ballart	4
Plantae	Flora	Santalaceae	5864	<i>Exocarpos strictus</i>		Dwarf Cherry	21
Plantae	Flora	Santalaceae	5867	<i>Omphacomeria acerba</i>			1

Plantae	Flora	Santalaceae	5871	<i>Thesium australe</i>	Austral Toadflax	V	V	7
Plantae	Flora	Sapindaceae	ACER	<i>Acer spp.</i>	*			1
Plantae	Flora	Sapindaceae	5913	<i>Dodonaea viscosa</i>	Sticky Hop-bush			1
Plantae	Flora	Sapindaceae	7690	<i>Dodonaea viscosa subsp. angustifolia</i>				4
Plantae	Flora	Sapindaceae	7830	<i>Dodonaea viscosa subsp. angustissima</i>	Narrow-leaf Hop-bush			7
Plantae	Flora	Sapindaceae	11410	<i>Dodonaea viscosa subsp. cuneata x spatulata</i>				1
Plantae	Flora	Sapindaceae	7068	<i>Dodonaea viscosa subsp. spatulata</i>	Broad-leaf Hopbush			4
Plantae	Flora	Scrophulariaceae	4607	<i>Orobancha minor</i>	*	Broomrape		2
Plantae	Flora	Scrophulariaceae	5999	<i>Verbascum virgatum</i>	*	Twiggy Mullein		8
Plantae	Flora	Solanaceae	6065	<i>Solanum aviculare</i>		Kangaroo Apple		1
Plantae	Flora	Stackhousiaceae	6120	<i>Stackhousia monogyna</i>		Creamy Candles		17
Plantae	Flora	Stackhousiaceae	6125	<i>Stackhousia viminea</i>		Slender Stackhousia		1
Plantae	Flora	Stylidiaceae	11453	<i>Stylidium armeria</i>				1
Plantae	Flora	Stylidiaceae	6157	<i>Stylidium graminifolium</i>		Grass Triggerplant		56
Plantae	Flora	Stylidiaceae	11285	<i>Stylidium montanum</i>				1
Plantae	Flora	Stylidiaceae	STYL	<i>Stylidium spp.</i>				1
Plantae	Flora	Thymelaeaceae	6170	<i>Pimelea alpina</i>				1
Plantae	Flora	Thymelaeaceae	7731	<i>Pimelea axiflora subsp. axiflora</i>				1
Plantae	Flora	Thymelaeaceae	6176	<i>Pimelea curviflora</i>		Rice Flower		4
Plantae	Flora	Thymelaeaceae	7241	<i>Pimelea curviflora var. sericea</i>				2
Plantae	Flora	Thymelaeaceae	7642	<i>Pimelea glauca</i>		Smooth Rice-flower		2
Plantae	Flora	Thymelaeaceae	7182	<i>Pimelea ligustrina subsp. ciliata</i>				5
Plantae	Flora	Thymelaeaceae	8676	<i>Pimelea ligustrina subsp. ligustrina</i>				1
Plantae	Flora	Thymelaeaceae	6182	<i>Pimelea linifolia</i>		Slender Rice Flower		18

Plantae	Flora	Thymelaeaceae	7679	<i>Pimelea linifolia</i> subsp. <i>caesia</i>			12
Plantae	Flora	Thymelaeaceae	6635	<i>Pimelea linifolia</i> subsp. <i>collina</i>			6
Plantae	Flora	Thymelaeaceae	6814	<i>Pimelea linifolia</i> subsp. <i>linifolia</i>			2
Plantae	Flora	Thymelaeaceae	6186	<i>Pimelea pauciflora</i>			22
Plantae	Flora	Thymelaeaceae	PIME	<i>Pimelea</i> spp.			6
Plantae	Flora	Urticaceae	6223	<i>Australina pusilla</i>			1
Plantae	Flora	Verbenaceae	6256	<i>Verbena bonariensis</i>	*	Purpletop	1
Plantae	Flora	Verbenaceae	10720	<i>Verbena quadrangularis</i>	*		1
Plantae	Flora	Verbenaceae	11406	<i>Verbena rigida</i> var. <i>rigida</i>	*	Veined Verbena	1
Plantae	Flora	Violaceae	12061	<i>Melicytus dentatus</i>		Tree Violet	1
Plantae	Flora	Violaceae	MELY	<i>Melicytus</i> spp.			1
Plantae	Flora	Violaceae	6270	<i>Viola betonicifolia</i>		Native Violet	62
Plantae	Flora	Violaceae	6272	<i>Viola hederacea</i>		Ivy-leaved Violet	20
Plantae	Flora	Winteraceae	6291	<i>Tasmannia lanceolata</i>		Mountain Pepperbush	11
Plantae	Flora	Winteraceae	11181	<i>Tasmannia xerophila</i> subsp. <i>xerophila</i>		Alpine Pepperbush	3
Plantae	Flora	Xanthorrhoeaceae	6316	<i>Xanthorrhoea australis</i>		P	2
Plantae	Flora	Xanthorrhoeaceae	8752	<i>Xanthorrhoea glauca</i> subsp. <i>angustifolia</i>		P	1
Animalia	Mammalia	Miniopteridae	3330	<i>Miniopterus orianae oceanensis</i>		Large Bent-winged Bat	V, P 5
Community				Coolac-Tumut Serpentine Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions		Coolac-Tumut Serpentine Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	E3 K



Community	<i>Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions</i>	Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions			K
Community	<i>Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions</i>	Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	E3	E	K
Community	<i>Windswept Feldmark in the Australian Alps Bioregion</i>	Windswept Feldmark in the Australian Alps Bioregion	E4B		K
Community	<i>White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner</i>	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner	E4B	CE	K

Figures

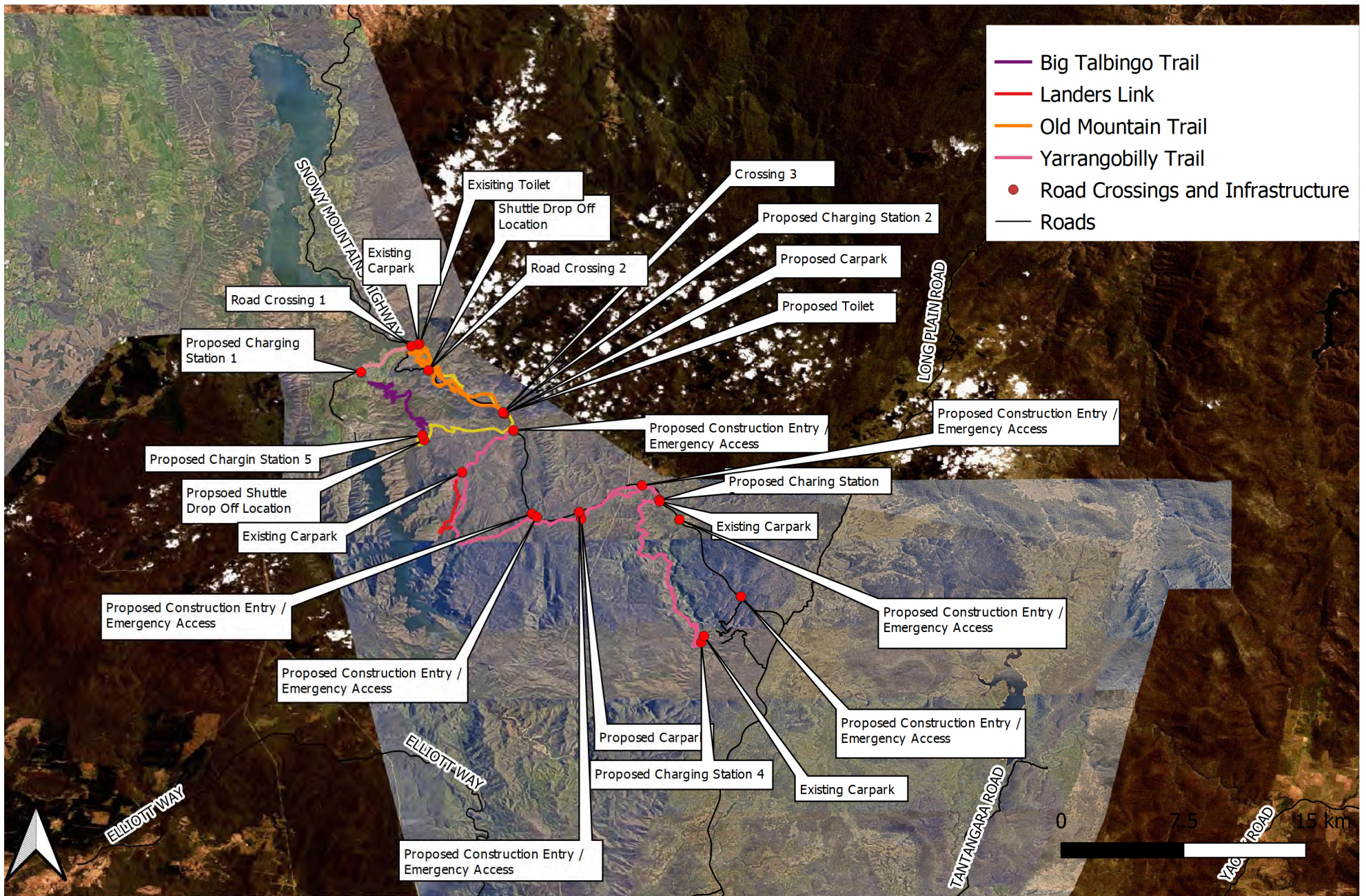
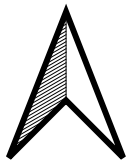
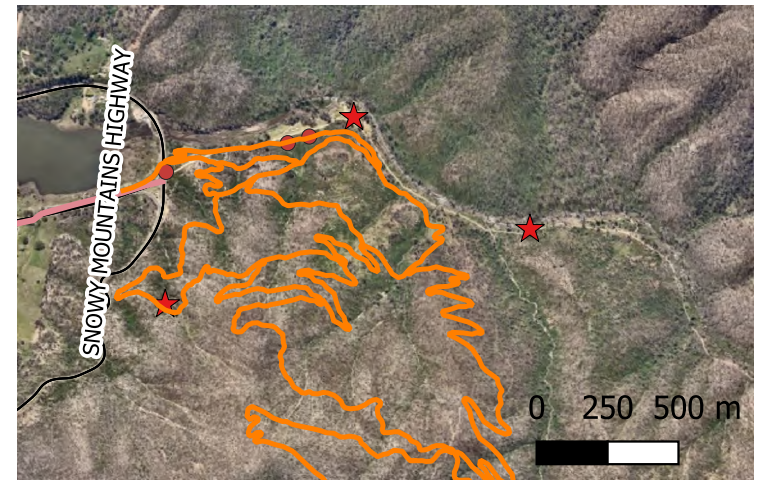
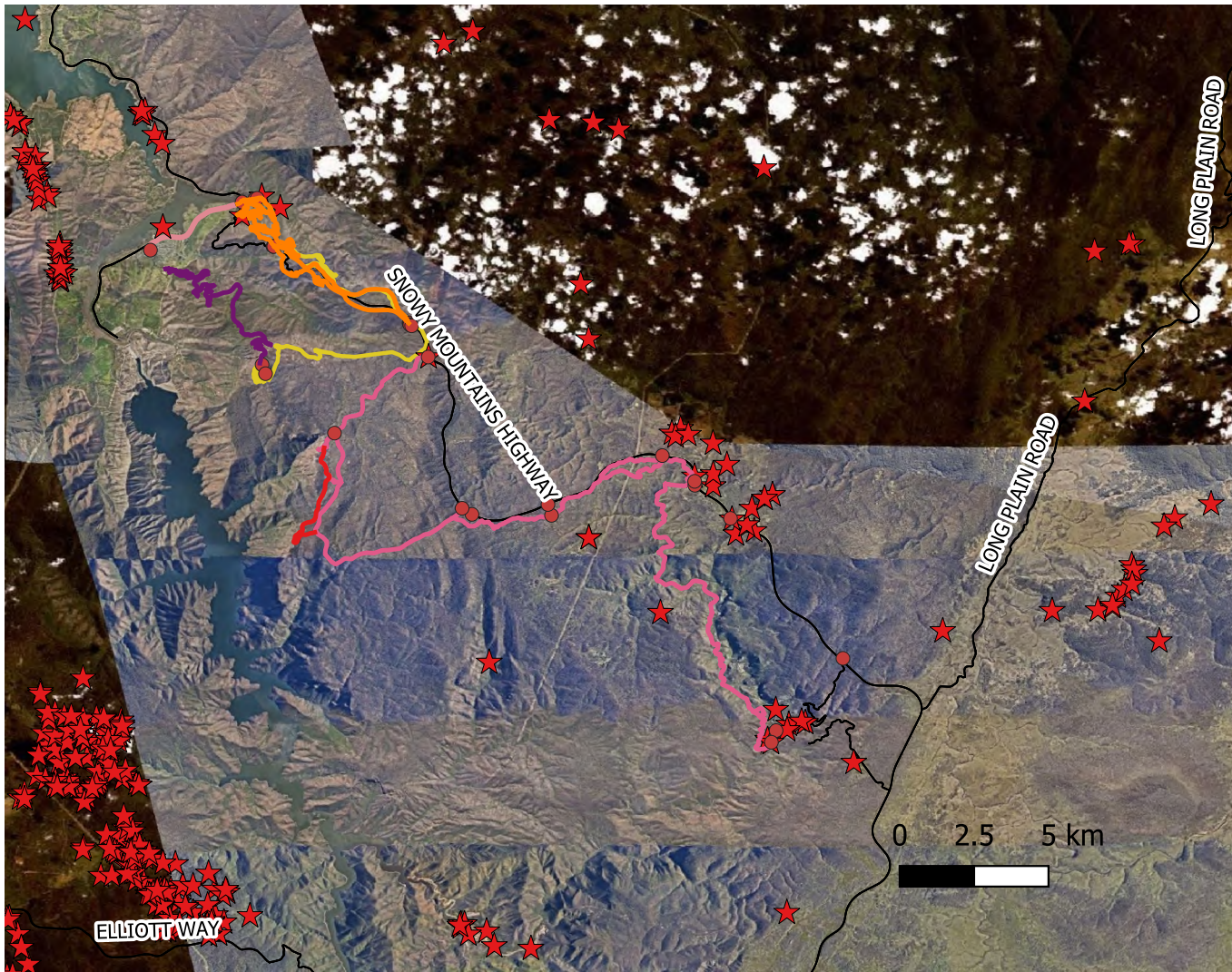


Figure 1
Talbingo and Yarrangobilly Proposed Mountain Bike Trail



- Big Talbingo Trail
- Landers Link
- Old Mountain Trail
- Yarrangobilly Trail
- Road Crossings and Infrastructure
- ★ AHIMS Survey
- Roads

Figure 2
 AHIMS Search
 Talbingo and Yarrangobilly Proposed Mountain Bike Trail

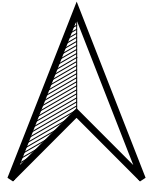
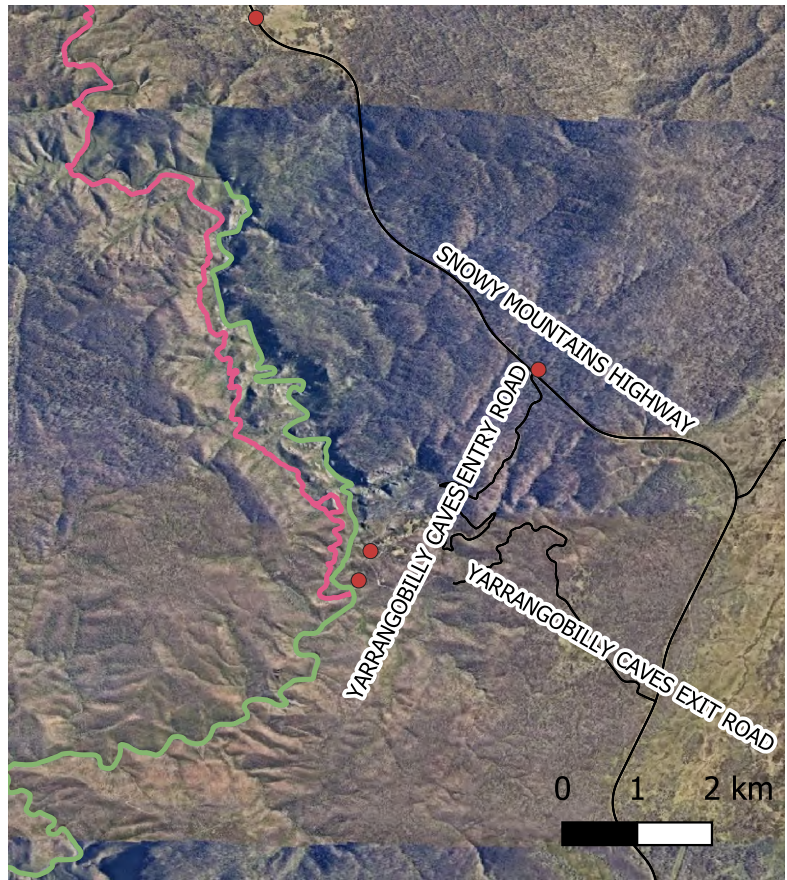
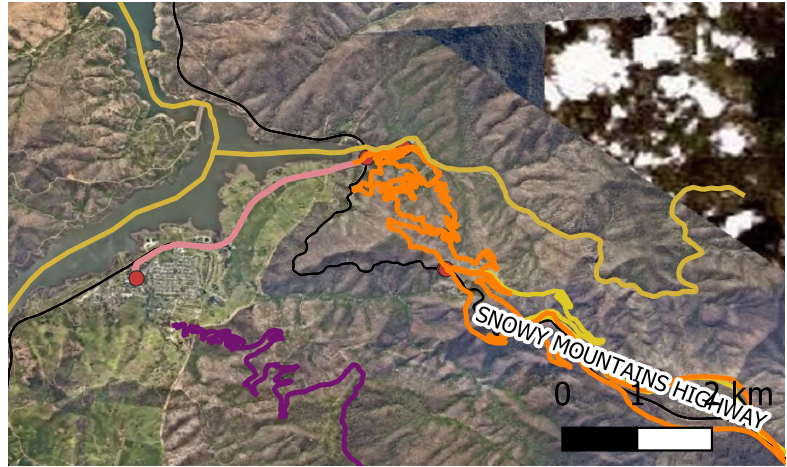
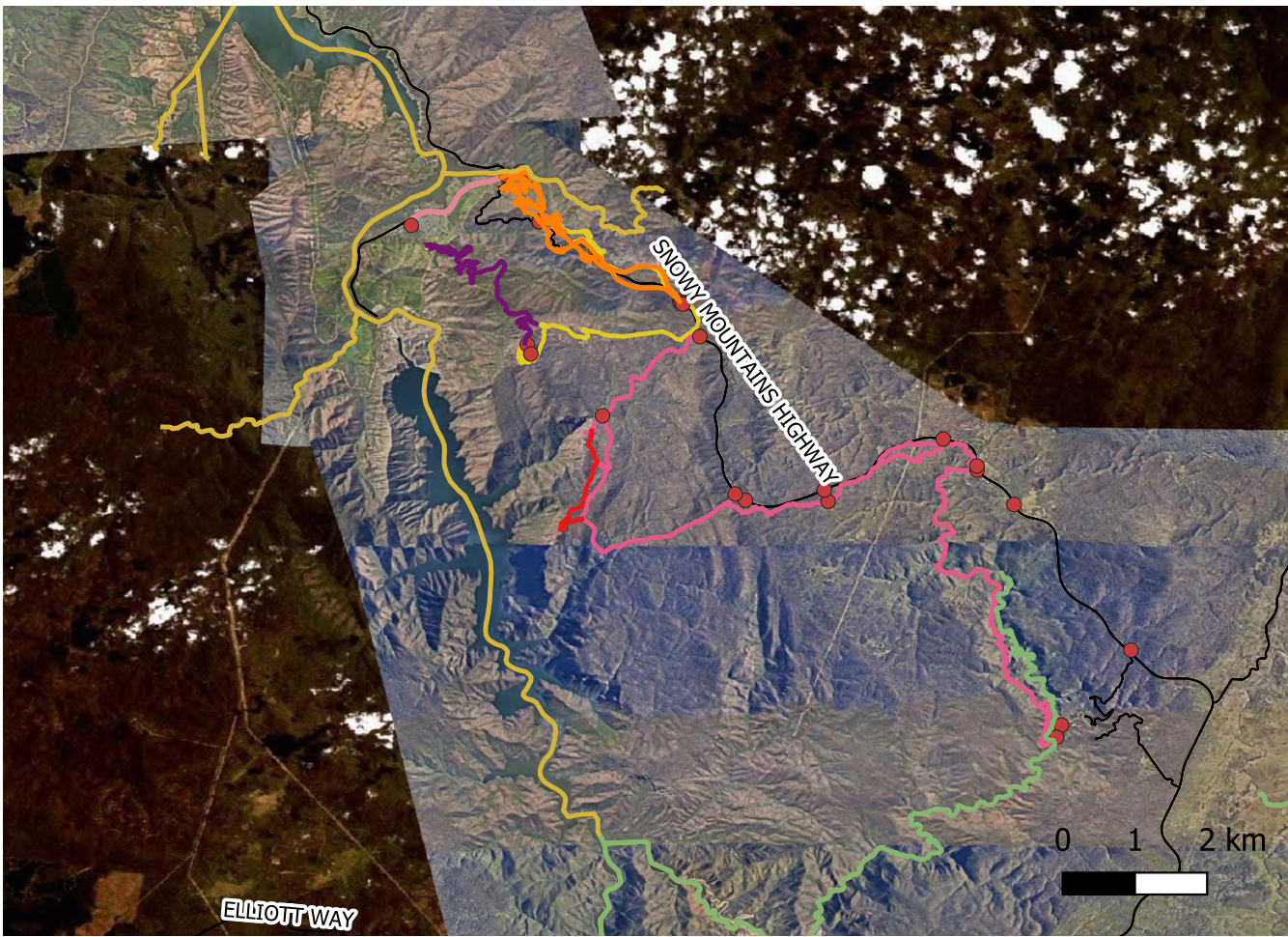


Figure 3
Threatened Fish Species Search
Talbingo and Yarrangobilly Proposed Mountain Bike Trail

- Endangered Macquarie Perch Habitat
- Vulnerable Murray Crayfish Habitat
- Big Talbingo Trail
- Landers Link
- Old Mountain Trail
- Yarrangobilly Trail
- Road Crossings and Infastructure
- Roads

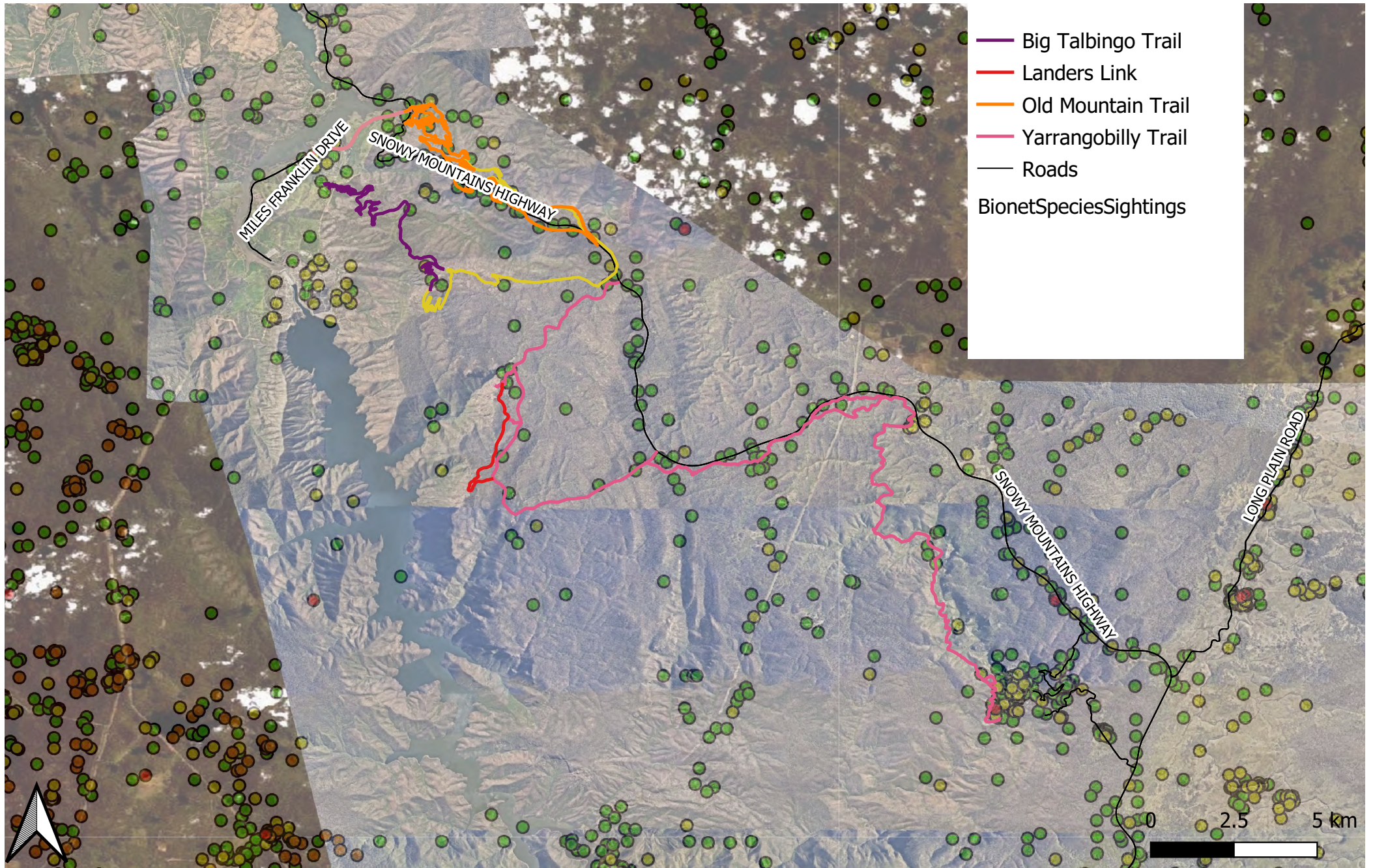


Figure 4
 Species Assessment
 Talbingo and Yarrangobilly Proposed Mountain Bike Trail

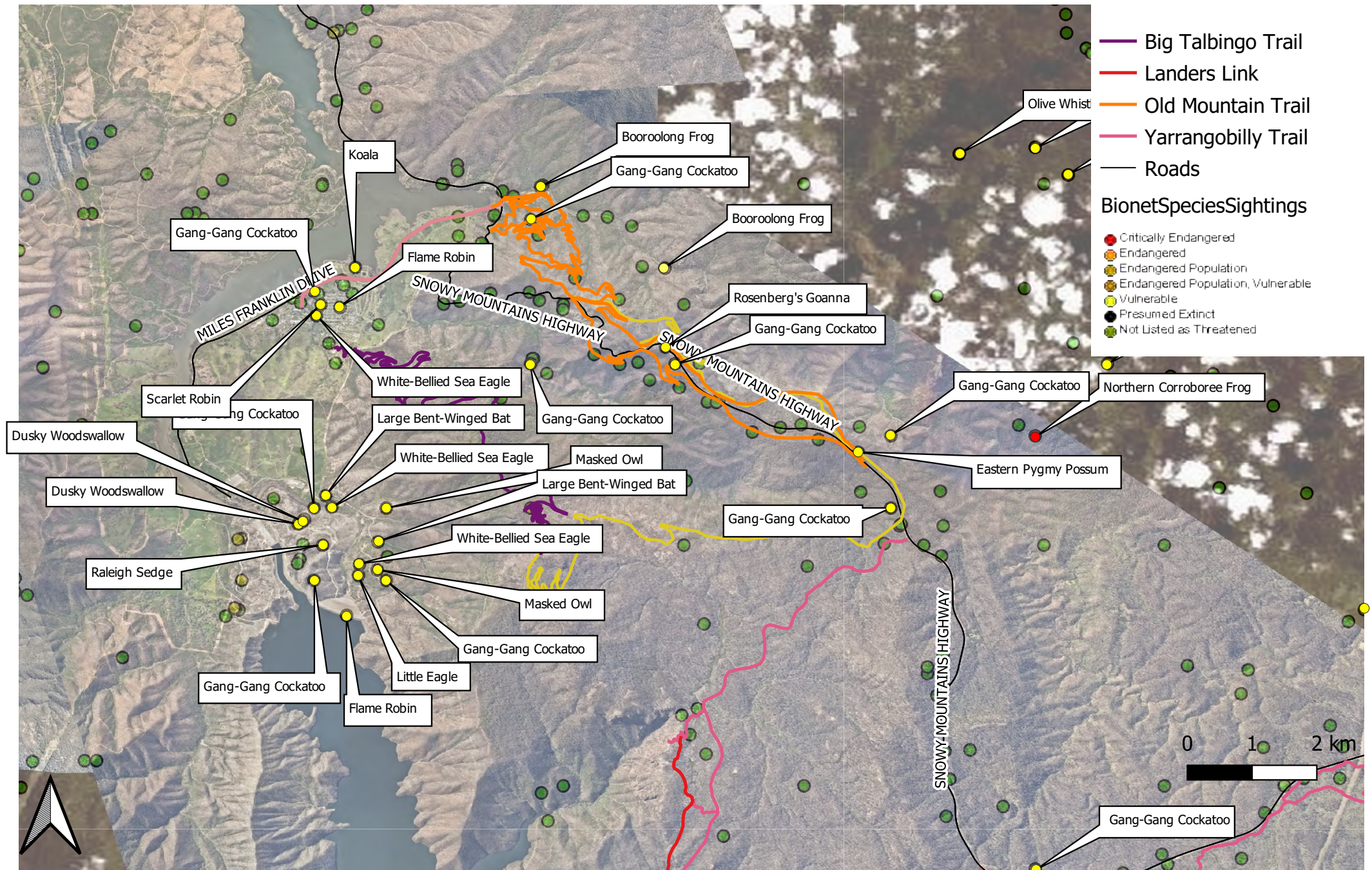


Figure 4a
Species Assessment
Talbingo and Yarrangobilly Proposed Mountain Bike Trail

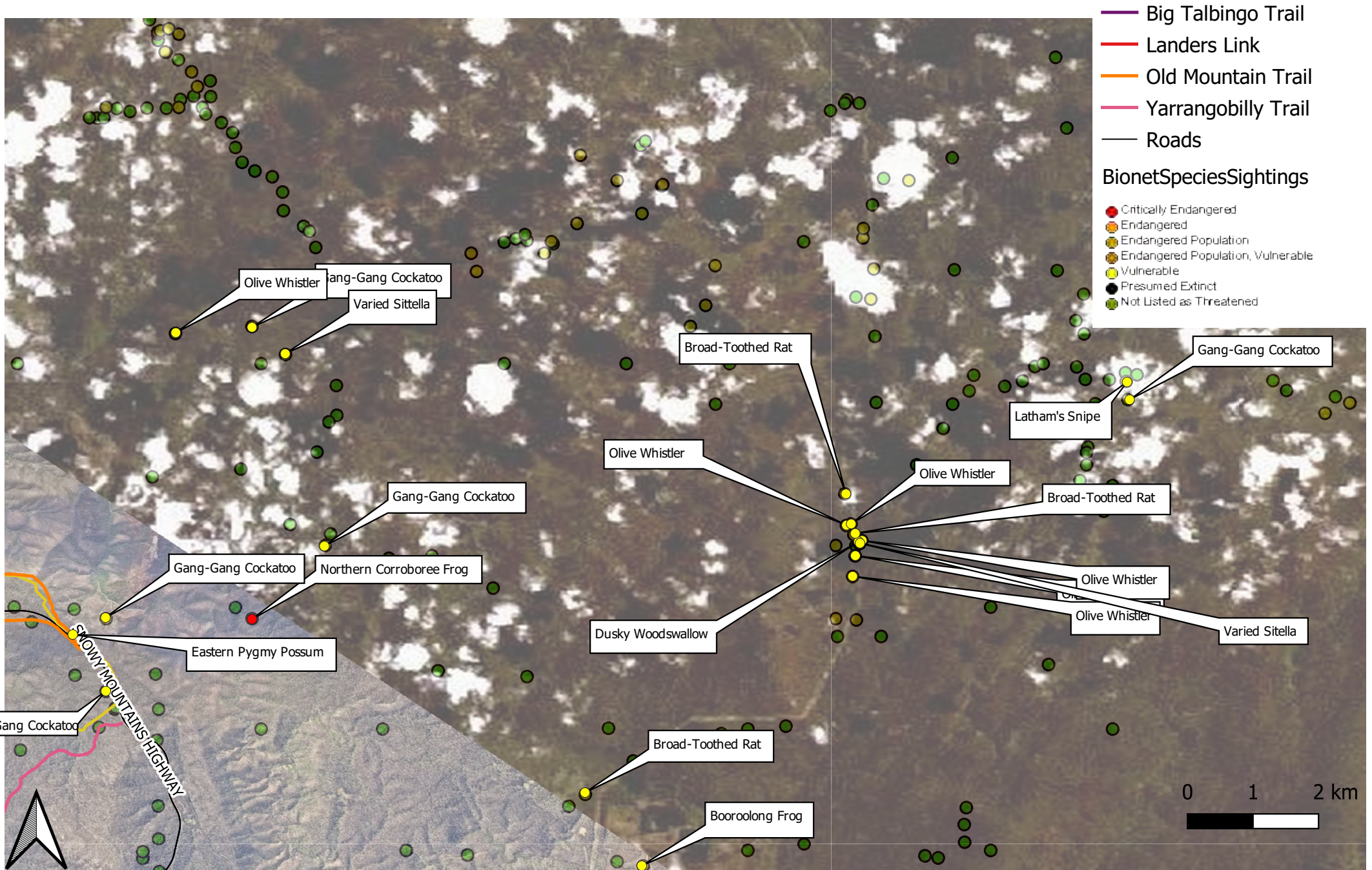


Figure 4b
 Species Assessment
 Talbingo and Yarrangobilly Proposed Mountain Bike Trail

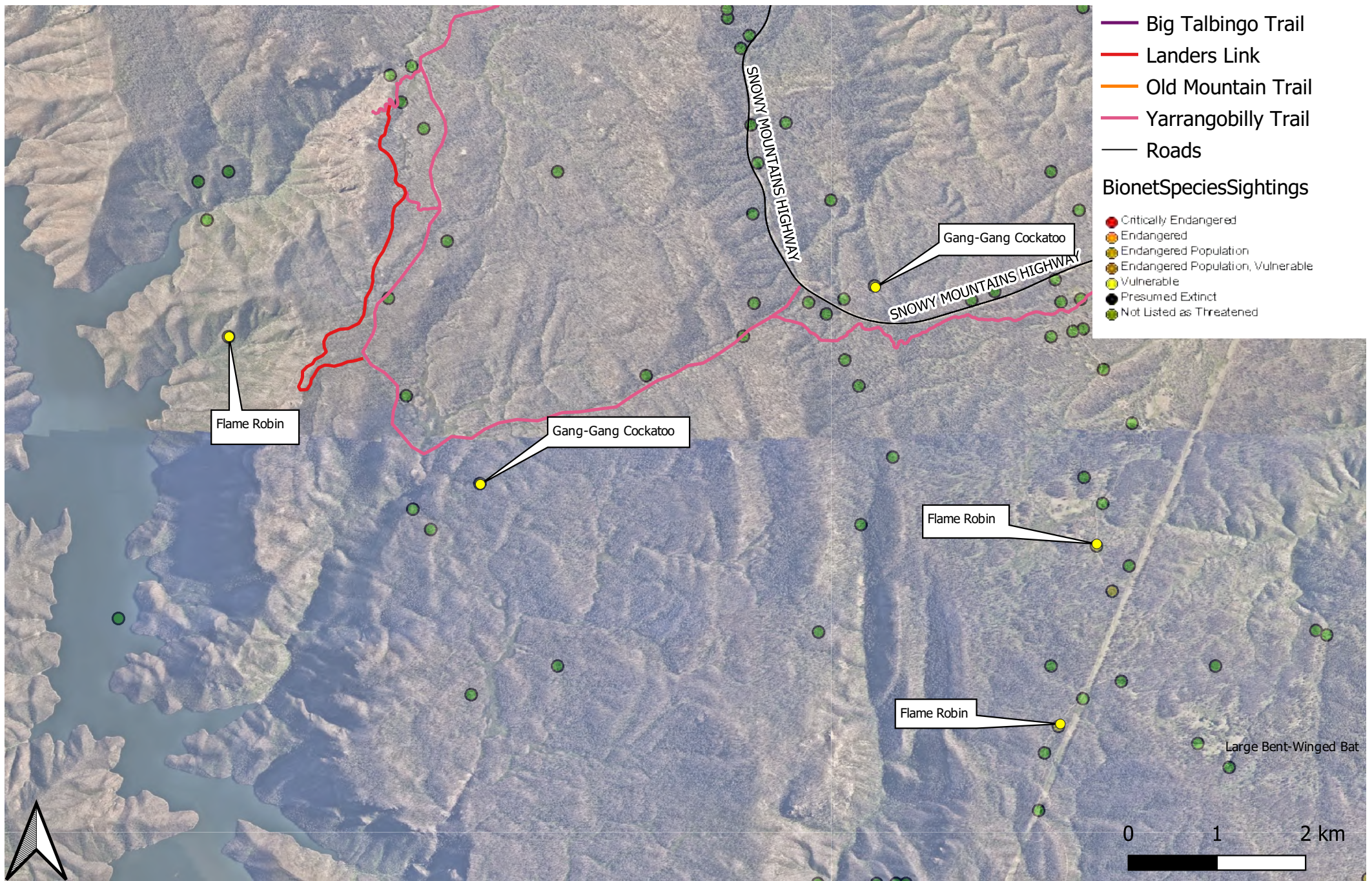


Figure 4c
 Species Assessment
 Talbingo and Yarrangobilly Proposed Mountain Bike Trail

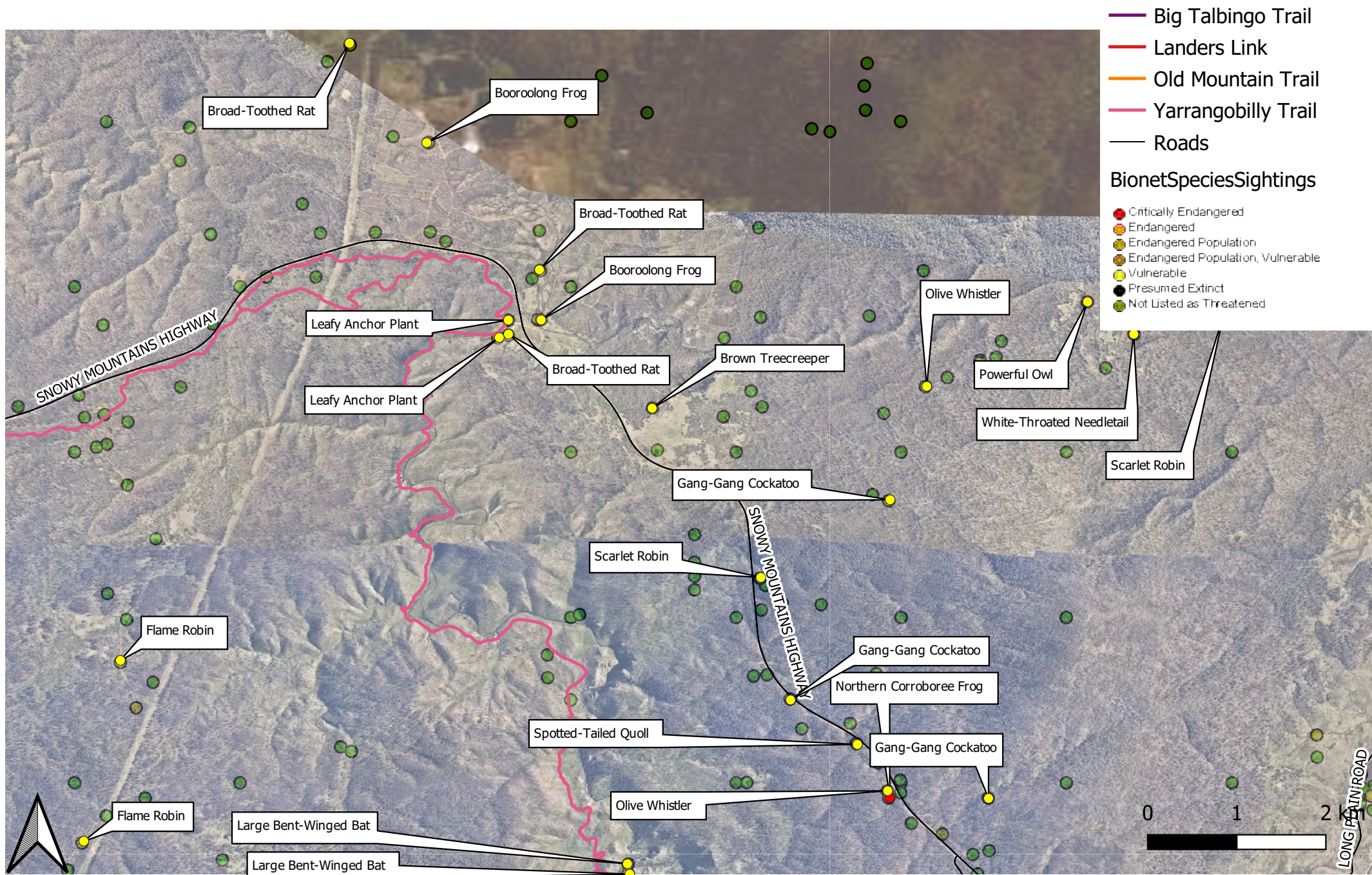


Figure 4d
 Species Assessment
 Talbingo and Yarrangobilly Proposed Mountain Bike Trail

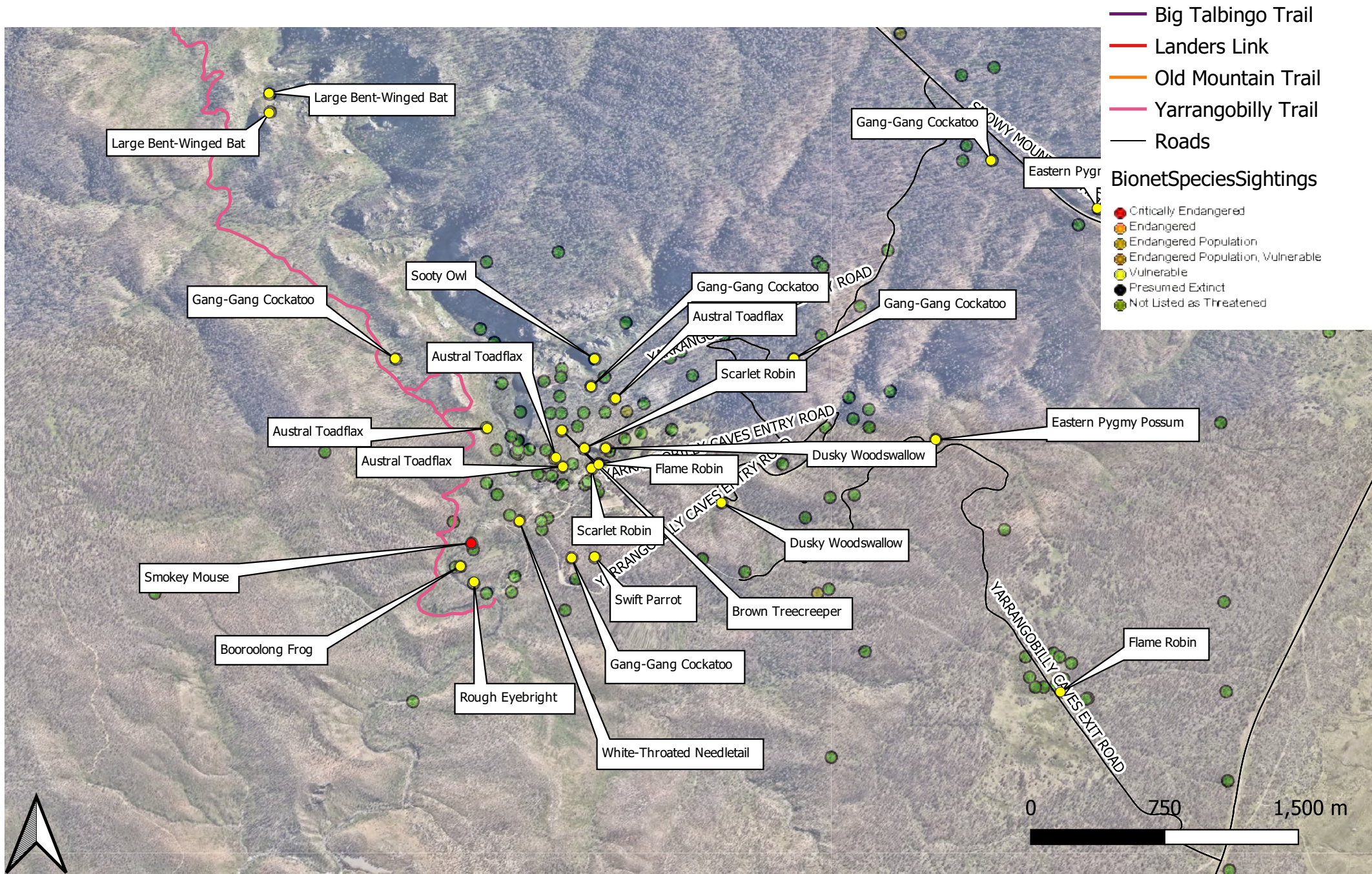


Figure 4e
 Species Assessment
 Talbingo and Yarrangobilly Proposed Mountain Bike Trail

Appendix G: Talbingo and Yarrangobilly Project Delivery Risk Register

To be included following Stakeholder and Community Consultation