

DEVELOPMENT PROPOSAL AND ENVIRONMENTAL MANAGEMENT PLAN

SCENIC RIM TRAIL THORNTON TRAILHEAD TO SPICERS PEAK NATURE REFUGE



Cover image: Tony Charters

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EXECUTIVE SUMMARY

Background

The Scenic Rim Trail – Thornton Trailhead to Spicers Peak Nature Refuge is a commercial proposal to establish a multi-day bushwalking experience in the Main Range on the western part of the Scenic Rim, part of Main Range National Park and the Gondwana Rainforests of Australia World Heritage Area. Walkers will experience sub-tropical rainforests, tall eucalypt forests, Mountain heathlands, waterfalls and spectacular views. The length of the proposed Class 5 Trail is approximately 53 km and is made up of existing National Park tracks, QPWS management roads, existing Gainsdale Pty Ltd walking tracks and new walking tracks through National Park and Gainsdale lands. It also involves the re-opening of an old forestry road for walkers and access to management ATV vehicles associated with the trail.

In a spirit of collaboration and partnership, and with an ultimate goal of protecting the natural and cultural heritage values of the Scenic Rim, the Turner Family (via Gainsdale Pty Ltd) proposes to link its private Nature Refuges of some 8,000 ha with the Main Range National Park. The Scenic Rim Trail will traverse Gainsdale Pty Ltd properties and National Park to create a world-class long-range walk of five days duration with low-key accommodation nodes located along the route. The trail will be used by Spicers Group for small group walking experiences and will also be open to the public, while the accommodation nodes will be accessible only to 'Scenic Rim Trail' guests. The Scenic Rim Trail will consist of a mix of existing National Park tracks and new wilderness trails.

Construction, maintenance and monitoring costs for all proposed infrastructure will be fully funded by the Turner Family via Gainsdale Pty Ltd. These funds are not dependent on finance, investor partners, economic cycles or other limiting factors.

This Development Proposal and Environmental Management Plan has been prepared as part of Stage 3 of the development assessment process for consideration by the Queensland Parks and Wildlife Service (QPWS). It brings together all elements of the proposal, describes the natural values of the project area, assesses the potential environmental impacts of the proposal and sets out the environmental management actions to ensure the project avoids, minimises and manages environmental impacts within the Main Range National Park. Components of the project beyond the boundaries of the National Park will be subject to assessment under local government planning laws and schemes.

There is potential for the project to impact on Matters of National Environmental Significance listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), including World and National Heritage values, threatened species and migratory species protected under international agreements. As such the project is being referred to the Commonwealth for assessment under the EPBC Act.

The World Heritage Values of the area are paramount to the experience being proposed by Gainsdale Pty Ltd. At all stages of this project steps will be taken to protect the heritage values, both cultural and natural. This is being achieved through a range of initiatives, which each contribute to the protection and conservation of the area:

- sustainable management of the adjoining lands under Turner family ownership so as to ensure protection of habitat for endemic species and the control of weed species;
- limiting use of the Trail to small groups (up to 10 guests) and limited departures per week, with operations scaled back in the summer months (prime growing season);
- involvement of a group of leading specialists in natural and cultural heritage assessment, ecotourism planning and development, sustainable architecture, fire management and heritage interpretation; and
- committing to ongoing maintenance of the trails and tracks over the long term.

Impact Assessment

This report identifies potential impacts of the project on the natural values of Main Range National Park, sets out avoidance, mitigation and management measures, and applies risk assessment to specific ecological values to ensure environmental planning and management responses are appropriately targeted. This process has resulted in a statement of management commitments to be incorporated into the project Environmental Management Plan, including the Construction Environmental Management Plans that will be prepared by any contractors involved in the construction phase of the project. A Construction Management Plan has been prepared that sets out specific requirements for the construction of each component of the project, including access, storage, laydown, toilets and waste management.

The Master Plan for Queensland's parks and forests to 2025 includes among the QPWS core service areas: (i) managing parks and forests for conservation and for people, and (ii) facilitating ecotourism, recreation and heritage experiences within the protected area estate. One of the challenges emphasized in the Master Plan is that of balancing improved conservation with the growth of the tourism industry, and providing better access for all Queenslanders and visitors.

This is the core of the assessment of the suitability of the Scenic Rim Trail project - balancing the opportunity for the development of a world class ecotourism experience within the Main Range National Park and Gondwana Rainforest World Heritage Area with achieving the goal for improved conservation outcomes.

The proposal is for low-intensity recreation activities, with the least structured (Class 5) walking trails, re-opening of a former forestry road to enable access by low impact ATVs for logistics and management, and low-impact overnight accommodation along the approximately 53 km long trail, made up of:

- 20.1 km of existing class 3 and 4 National Park walking track;
- 17.2 km of Class 5 track to be established within the National Park
- 5.6 km of existing National Park management roads and fire trails;
- 4.5 km of existing class 5 track on privately owned land; and
- 5.7 km of new class 5 track on privately owned land.

Within National Park, the trail will result in the direct and indirect disturbance of around 0.4 ha of ground layer vegetation, mostly within rainforest. The accommodation nodes and an associated lookout and track diversion will require localized removal of the ground layer and shrubs from within an area totaling round 0.13 ha within *Eucalyptus* Open Forest. A further 1.5 ha of rainforest regrowth and 0.05 ha of *Eucalyptus* forest understorey would be removed for re-opening of the former forestry road. The re-opening of the former forestry road would avoid removal of larger regrowth trees while new sections of trail will aim to minimise disturbance to shrubs and saplings.

Assessment of the potential impacts of the project on the biodiversity values of the National Park finds that there are known and potential species of special conservation significance present in the project area, and that appropriate design, mitigation and management actions will avoid significant impacts on those species. Potential impacts assessed as requiring particular attention are:

- Ensuring there are no impacts on aquatic environments to protect habitats for stream-dwelling frogs and the Mt Mistake Spiny Cray;
- Ensuring there are no impacts on Hastings River Mouse in habitat adjacent to the Woodcutters Ecocamp;
- Ensuring there are no impacts on Eastern Bristle Bird habitat and individuals (if/when present) in the Mt Mitchell Trail section;
- Preventing the introduction and/or spread of weeds, pathogens and feral animals; and

- Controlling existing Feral Pig numbers.

Specific measures (included as commitments) have been developed to prevent or manage and monitor these risks, and with the implementation of these measures the impact assessment finds that:

- Potential impacts on individual ecological communities and flora species assemblages as a result of construction of the road, trails and overnight nodes will be negligible. The proposed impacts will not interfere with ongoing plant reproduction, dispersal and regeneration except at a highly localised scale.
- Flora species of special conservation significance are unlikely to be at risk as a result of the construction and operation of the project. Special attention will be given to managing a known population of Bunya Mountains Bluegrass to minimise loss of individuals in the construction phase and to maintain habitat condition post construction through continued planned use of fire and targeted weed control on an as-required basis.
- For terrestrial vertebrate and aquatic species management protocols, especially in response to information from ecoguides on weed establishment, presence of feral herbivores and predators, presence of Cane Toads, enhanced erosion and any nesting close to the trail or Ecocamps by species such as Glossy Black-Cockatoo and Red Goshawk will significantly reduce most residual impacts.
- Ecoguides ensuring appropriate behaviour by walkers will also minimise or, more likely, completely remove any likelihood of unplanned fires.
- The disturbance of fauna through the presence of walkers is an unavoidable and on-going impact, though education of walkers about appropriate behaviour and the immediate advice of ecoguides will minimise any disturbance.
- The presence of the conservation significant Hastings River Mouse adjacent to the Woodcutters Ecocamp location requires baseline study, the development of specific Ecocamp design and operation parameters and ongoing monitoring and management of the species and its habitat.
- While the proposed trail in the Mt Mitchell Trail section follows existing walking tracks and trails, the presence of habitat for the EPBC Act and NC Act endangered Eastern Bristlebird in this location requires ongoing monitoring for the species and if recorded, the development of specific operational, monitoring and management measures. The species has not been recorded from the project area for over 20 years following a fire event, although the habitat is still present and may be recolonised.

Baseline and ongoing monitoring programs and research are stressed as important for ensuring adaptive management. The project will have a significant resource for wildlife research and management in the Hidden Vale UQ Wildlife Facility, a development that has been substantially funded, and will continue to be supported, by the Turner family. The facility may play an important role in researching possibilities for reintroduction of Eastern Bristlebird into suitable habitat south of Cunningham's Gap.

The specific management of Main Range National Park is set out in the Main Range National Park and Spicers Gap Road Conservation Park Management Statement 2013 which stresses the conservation values of the National Park for flora and fauna habitat and wildlife movement, and as the northern-most extent of the World Heritage listed Gondwana Rainforests of Australia, which make up 77% of the total National Park area.

This proposal addresses the desired outcomes of the QPWS Master Plan (2014) through stating responsibility to those outcomes through project design and committing to management actions for:

- Fire management and fire safety

- Cooperation with QPWS and surrounding landholders
- Pest (weed and feral animal) management
- Protection and restoration of biodiversity values
- Programs for better understanding biodiversity values through a range of baseline survey and monitoring programs
- Maintaining landscape integrity through sensitive, low-key design.

The QPWS Master Plan indicates that the Strategic Overview for Management of the Gondwana Rainforests of Australia World Heritage Area also applies to management of Main Range National Park. The required management responses to relevant issues set out in the Strategic Overview that are relevant to the project are addressed in this report. The proposal is able to meet the necessary management responses through a combination of design, planning, consultation and formulation of appropriate management and monitoring actions. Through the presence of ecoguides on the trail on a very regular basis, there is a significant opportunity for continuous monitoring and adaptive management.

An assessment of the potential impact of the project on World Heritage Values and other matters of national environmental significance will be the subject of a referral of the project to the Commonwealth government.

A Community and Stakeholder Engagement Plan has been prepared, and through this process the cultural values of the project area will be determined and addressed.

Due to the low-key nature of the proposal, no visual or aesthetic impacts are predicted.

The Scenic Rim Trail project will not displace any existing economic or social activity in the region. It will contribute to emerging ecotourism activity in the region and will create both direct and indirect employment opportunities. As part of the total agricultural, conservation and tourism activities of Gainsdale Pty Ltd the Scenic Rim Trail will contribute to the sustainability of the regional economy and broadening the base upon which the economy is based. Economic activity will be enhanced both in the Lockyer Valley and Southern Downs Regional Council areas.

1. INTRODUCTION

1.1. PROJECT OVERVIEW

The Scenic Rim Trail – Thornton to Spicers Peak Nature Refuge is a commercial proposal by Gainsdale Pty Ltd (the Turner Family) to establish a multi-day bushwalking experience from Mt Mistake to Spicers Peak Nature Refuge in the Main Range on the western part of the Scenic Rim, part of Main Range National Park and the Gondwana Rainforests of Australia World Heritage Area (Figure 1.1, 3.1). Walkers will experience sub-tropical rainforests, tall eucalypt forests, Mountain heathlands, waterfalls and spectacular views. The length of the proposed Trail is approximately 53 km.

Walkers with the Scenic Rim Trail will be accompanied by interpretive ecoguides. Each evening will be spent at a different location and the style of accommodation will vary from remote wilderness Ecocamp to more highly equipped Ecocamps. The walk uses private lands for all of the more developed accommodation (Ecolodges) and private lands where possible for the Ecocamps. However, on the whole, only National Park lands are suitable for the walking trail and the wilderness Ecocamps due to high altitude of the area and location of ridgelines in National Park tenure. For the most part, the truly iconic elements of the Scenic Rim Trail rely on access to the Main Range National Park. The trail components within National Park will also be available to free and independent walkers under conditions prescribed by QPWS. There are limited records of the number of backcountry walkers using parts of the proposed trail, but there is evidence of low level use – evident through a number of footpads – particularly in the southern area from Mt Castle Lookout to Bare Rock.

While the proposed Trail and associated facilities form a discrete and independently viable project, this proposal is a component of a vision for a larger track network from Cunningham's Gap to Springbrook, picking up on adventurer, naturalist and tourism pioneer Arthur Groom's concepts - including the notion of developed lodges at key access points interspersed with campsites - and bringing them to 21st century relevance. The basic aspects of access, infrastructure and style of camping are still as relevant today as they were 74 years ago. Future, proposed stages of the Trail will be subject to independent assessment and approvals.

The Management Statement for the Main Range National Park DNPRSR (2013) makes significant reference to the diversity of species and role of the Main Range in the broader management of the Gondwana World Heritage Area. Additionally Main Range takes an important role in nature-based recreation, from remote walking and camping through to developed camping grounds and high-use, popular walks. Reference is made to the need for an ongoing remote area campsite monitoring program aimed at minimising environmental degradation.

The proposed project is 100% privately funded by Gainsdale Pty Ltd (the Turner Family), owners of the Spicers Group.

1.2. CURRENT STATUS OF THE PROPOSAL

Changes to the Queensland *Nature Conservation Act 1992* (NC Act) in 2012 resulted in a state-wide Expression of Interest to be released in 2013 calling for suitable individuals and organisations to submit ideas for the development of ecotourism facilities on Queensland protected areas and adjacent State land.

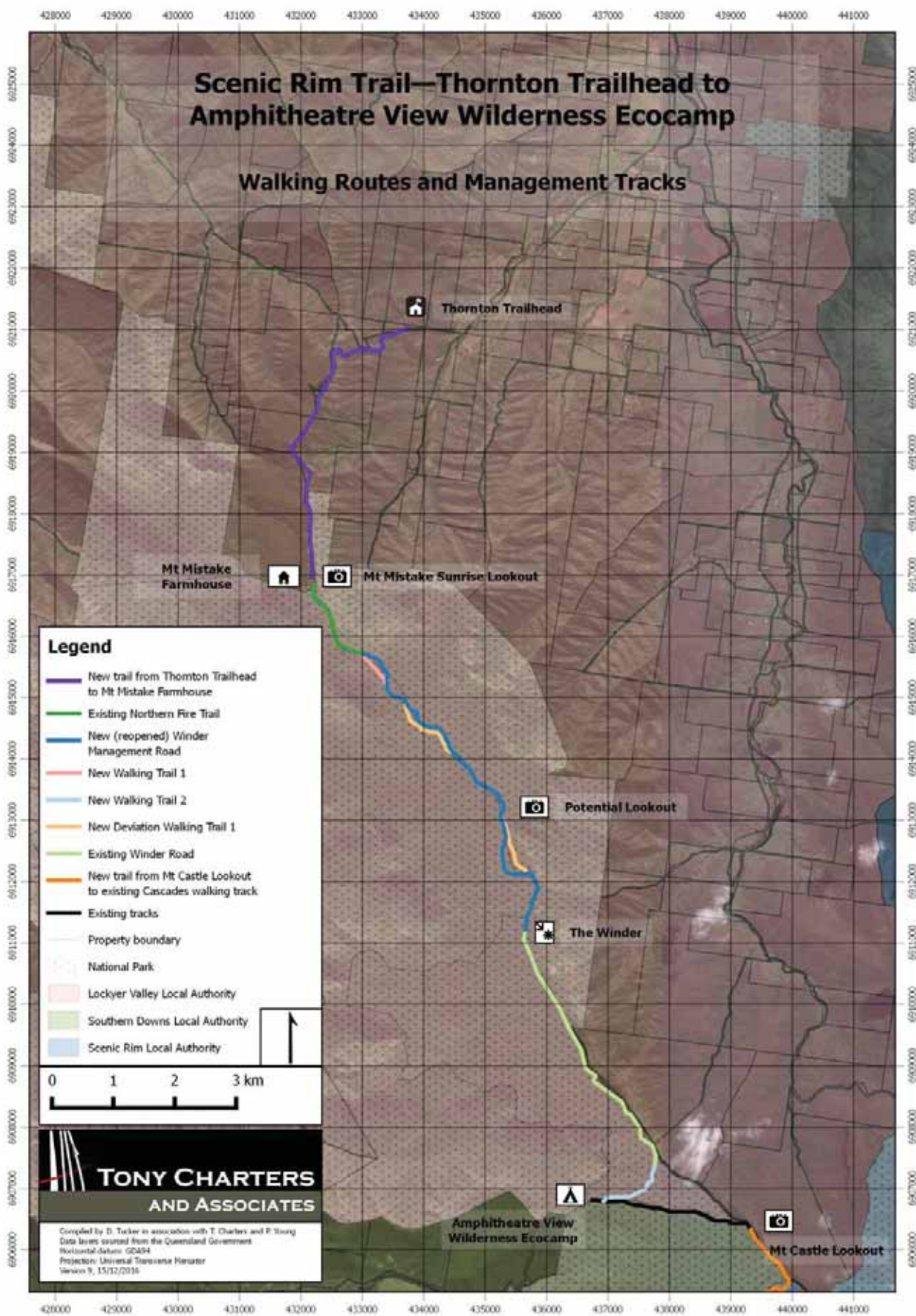


Figure 1.1 – Proposed Trail Route and Overnight Accommodation Nodes

A response to the Expression of Interest was submitted by Gainsdale Pty Ltd for the Scenic Rim Trail in 2013. The Expression of Interest was accepted and progressed to Stage 2 of the assessment process. In March 2015 the proponent submitted a document for a Stage 2 Request for Detailed Proposal.

The NC Act provides for the development of ecotourism facilities in national parks. All approved ecotourism facilities must be in the public interest, ecologically sustainable and, to the greatest possible extent, preserve the land's natural condition and protect its cultural resources and natural values. It is intended that each approved facility is designed and managed sensitively to ensure it is compatible with the nature and character of the site and complements the management of the national park in which it is located.

Authorisations allow for the building of infrastructure and structures (including ecotourism facilities) in protected areas in Queensland for a fixed term. These authorisations are granted under Sections 34, 35 and 35A of the NC Act and must be managed according to the requirements of Sections 15 and 34(2) of the Act.

The proposal must consider any management statement or plan in effect for a protected area, although under the Act the chief executive of the Department of National Parks, Sports and Racing can allow uses within a national park or protected area that are inconsistent with the management principles or plan if:

- the basic principle for the management of national parks will be observed as far as possible (if the land is in a national park)
- the use will be in the public interest
- the use is ecologically sustainable
- there is no reasonable alternative to the use.

This Development Proposal and Environmental Management Plan has been prepared as part of Stage 3 of the development assessment process for consideration by the Queensland Parks and Wildlife Service (QPWS). It brings together all elements of the proposal, describes the natural and cultural values of the project area, assesses the potential environmental impacts of the proposal and sets out the environmental management actions to ensure the project avoids, minimises and manages environmental impacts within the Main Range National Park.

Rainforest sections of the park and Open Forests along the central spine of the range are included in the Gondwana Rainforests of Australia World Heritage Area (Gondwana Rainforests of Australia). The World Heritage area makes up 77 per cent of the park. Main Range is the northern-most section of the Gondwana Rainforests of Australia, which are also National Heritage Listed Areas.

There is potential for the project to impact on Matters of National Environmental Significance listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), including World and National Heritage values, threatened ecological communities and species, and migratory species protected under international agreements. As such the project is being referred to the Commonwealth for assessment under the EPBC Act.

Components of the project beyond the boundaries of the National Park will be subject to assessment under local government planning laws and schemes. It is not intended to submit development applications to local government authorities until the project has State and Commonwealth Government approval.

1.3. RELEVANT LEGISLATION AND POLICIES

Legislation and policies relevant to the proposal are listed and described in Table 1.1.

In formulating the Development Proposal and Environmental Management Plan the policies and plans that have been considered are listed in Table 1.2.

Table 1.1 Relevant Legislation for the Scenic Rim Trail

Legislation or statutory policy	Potential Requirement			Application to the Scenic Rim Trail
	Approval	Permit	Compliance or Guideline	
Queensland <i>Nature Conservation Act 1992</i>	*	*	*	The approval process requires authority for the project to be granted under Sections 35 and 35A of the <i>Nature Conservation Act 1992</i> and must be managed according to the requirements of Sections 15 and 34(2) of the Act. The proponent must lodge an application for an authority to build in a protected area under section-35 of the Act.
Queensland <i>Nature Conservation (Wildlife Management) Regulation 2006</i>		*		With regards to ‘tampering with an animal breeding place’, activities such as clearing of vegetation or disturbing the ground surface in an area that supports an animal breeding place must be undertaken in accordance with a DEHP approved Species Management Program.
		*		With regards to taking protected plants by clearing, a protected plant survey is required if an area subject to clearing is within a “high risk area” on the flora survey trigger map. If no EVNT species are located, the results of the flora survey report are provided to DEHP with an exempt clearing notification form. Once acknowledgement of receipt is received, clearing can commence.
Queensland <i>Vegetation Management Act 1999</i>	*			Outside of the National Park, any clearing of vegetation to which the Act applies is “assessable development” under the <i>Sustainable Planning Act 2009</i> and would require a development approval in accordance with that Act.
Queensland <i>Biosecurity Act 2014</i>			*	Requires developers to appropriately manage all listed weeds encountered during the site construction and operation stages.
Environmental Protection Act 1994/ Environmental Protection Regulation 2008			*	Compliance with General Environmental Duty, Environmental Protection Regulation and Environment Protection Policies for water, air, noise and waste at all stages of the project may be required. Preparation of an Environmental Management Plan will be necessary. None of the proposed activities represent Environmentally Relevant Activities as defined under the EP Act.
Queensland <i>Water Act 2000</i>	*			An approval may be required for operational work considered to affect overland flow water, if the operations are mentioned as assessable development in a water resource plan.
Queensland <i>Aboriginal Cultural Heritage Act 2003</i>	*		*	All indigenous cultural heritage sites and artefacts are protected under this Act. Developers have certain duty of care obligations not to harm cultural heritage sites or items of significance during all stages of the project. Compliance with the Act will require: (i) a formal request to search the Indigenous Cultural Heritage Register for any existing sites of significance; and (ii) Consultation with local Traditional Owners at all project stages. A cultural heritage survey may then be required if sites exist or there is some concern from Traditional Owners.

Legislation or statutory policy	Potential Requirement			Application to the Scenic Rim Trail
	Approval	Permit	Compliance or Guideline	
Commonwealth <i>Native Title Act 1993/ Native Title (Queensland) Act 1993</i>	*			A search of the Register of Native Title Claims, the National Native Title Register and the Register of Indigenous Land Use Agreements managed by the National Native Title Tribunal will be required to identify Native Title issues associated with the proposed trail and camp areas.
Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>	*			The EPBC Act governs threats and impacts on: (i) a listed threatened community; (ii) providing habitat for threatened species; (iii) located on a national heritage place or world heritage place; (iv) within the catchment of a declared Ramsar wetland; or (v) on Commonwealth land Approval will be required if the action is 'a controlled action'.
Commonwealth Environmental Offsets Policy	*		*	Offsets are required wherever significant residual impacts on matters of national environmental significance cannot be avoided in which case an Offset Strategy is required for submission to and approval by the Department of the Environment. No significant residual impacts for MNES have been identified.
Sustainable Planning Act 2009/ State Planning Policy 2014/ Local Government Planning Schemes/ Local Laws	*			Outside of the National Park, development is regulated under the planning scheme or local law of the relevant local government authority. Development applications for the project will be prepared in consultation with Southern Downs Regional Council and Lockyer Valley Regional Council. A Material Change of Use development permit and operational and building works approvals may be required. Any areas subject to a State interest/jurisdiction or outside local planning schemes will be identified in the consultation process and processed via the State Assessment and Referral Agency.

Table 1.2 Policies and Plans Relevant to the Scenic Rim Trail

Policy or Plan	Application to the Scenic Rim Trail
South East Queensland Regional Plan 2009-2031	Statutory Regional Plan providing an integrated whole of region approach to planning and governance.
A Master Plan for Queensland's Parks and Forests 2014	The Master Plan outlines the strategic objectives for management to 2025 in the five core QPWS Service Areas: <ul style="list-style-type: none"> • Managing parks and forests for conservation and people • Facilitating ecotourism and heritage experiences within the protected area estate • Providing protected area services with Traditional Owners and Indigenous communities • Managing protected area permissions • Enhancing management capability.
Main Range National Park and Spicers Gap Road Conservation Park Management Statement 2013	Management Statements for National Parks in Queensland cover similar details to Management Plans, but are designed to be a more simple expression of management intent.
World Heritage Central Eastern Rainforest Reserves of Australia Strategic Overview for Management 2000	The overview was prepared by the Australian government in accordance with Australia's international responsibilities under the World Heritage Convention. It ensures that appropriate consideration is given to the World Heritage values of the Gondwana Rainforests of Australia World Heritage Area by managers when developing management prescriptions of the individual reserves in the listed area.
Draft 2015-2020 Queensland Ecotourism Plan	At its core the QEP states a commitment to collaboration and partnerships to facilitate best practice ecotourism experiences that provide a positive contribution back to Queensland's natural areas and cultural heritage assets, community and economy.
Border Ranges Rainforest Biodiversity Management Plan 2010	The objective of this Plan is to protect rainforest and related biodiversity and to provide a consistent and effective recovery program for species and communities of conservation concern. The recovery program focuses on improving the condition (connectivity and integrity) of rainforest and related vegetation communities and their component species and systems.
The Action Plan for Australian Reptiles	Recovery plans state what must be done to protect and restore important populations of threatened species and habitat, as well as how to manage and reduce threatening processes. These recovery plans have been consulted in the assessment of threats, impacts and management of the relevant species.
National Recovery Plan for the Spotted-tailed Quoll <i>Dasyurus maculatus</i>	
National Recovery Plan for the Red Goshawk <i>Erythrotriorchis radiatus</i>	
National Recovery Plan for the Brush-tailed Rock-wallaby <i>Petrogale penicillata</i>	
Queensland Brigalow Belt Reptile Recovery Plan 2008-2012	
Conservation Status and Draft Management Plan for <i>Dasyurus maculatus</i> and <i>D. hallucatus</i> in Southern Queensland	
Coxen's Fig Parrot <i>Cyclopsitta diophthalma coxeni</i> recovery plan	
National Recovery Plan for the Black-breasted Button-quail <i>Turnix melanogaster</i>	
Recovery Plan for the Hastings River Mouse <i>Pseudomys oralis</i>	
Recovery Plan for Stream Frogs of South East Queensland	

1.4. CONSULTATION

To this point consultation has been conducted principally with local, State and Commonwealth government agencies.

Pending further advice on Native Title issues, Gainsdale Pty Ltd will undertake consultation with traditional owners and a broad range of other interest groups and communities of interest as set out in the Community and Stakeholder Engagement Strategy (Appendix 1).

To date consultations have been undertaken with:

- Scenic Rim Regional Council
- Southern Downs Regional Council
- Lockyer Valley Regional Council
- Tourism and Events Queensland
- The Department of Tourism, Major Events Small Business and the Commonwealth Games
- Commonwealth Department of Environment – EPBC – overview of project and referral matters
- National Parks Association of Queensland – formally and informally with individual office bearers.

1.5. PURPOSE AND STRUCTURE OF THE DPEMP

The primary purpose of the DPEMP is to provide the information required for consideration of the proposal by the Queensland government. This document and the various reports that underpin it will also form the basis of the EPBC Act referral.

The structure of the DPEMP is outlined in Table 1.3.

Table 1.3 Structure of the DPEMP

DPEMP Section	Description
Section 1	Introduction and project overview
Section 2	Proposal description, including track route, track design, accommodation node design, the extent of the project footprint and fire design criteria
Section 3	Existing environment, including planning, land use, climate, heritage and biodiversity
Section 4	Potential effects and their management, including biodiversity, fire management, visual assessment and socio economic assessment
Section 5	Monitoring and Review
Section 6	Commitments
Section 7	Conclusion
Appendices	Supporting documentation

2. PROPOSAL DESCRIPTION

2.1. PROPOSAL OUTLINE

2.1.1. Vision

The Scenic Rim Trail – Thornton to Spicers Canopy Ecocamp is a commercial proposal to establish a multi-day bushwalking experience from Thornton Trailhead to Spicers Peak Nature Refuge in the Main Range on the western part of the Scenic Rim, part of the Gondwana World Heritage Area. Walkers will experience sub-tropical rainforests, tall eucalypt forests, Mountain heathlands, waterfalls and spectacular views. The length of the proposed Trail is approximately 53 km.

In a spirit of collaboration and partnership, and with an ultimate goal of protecting the natural and cultural heritage values of the Scenic Rim, Gainsdale Pty Ltd proposes to link its private Nature Refuges of some 8,000 ha with the Main Range National Park. The Scenic Rim Trail will traverse Gainsdale Pty Ltd properties and National Park to create a world-class long-range walk of five days duration. The trail will be used by 'Scenic Rim Trail' for small group walking experiences and will also be open to the public. The Scenic Rim Trail will consist of a mix of existing National Park tracks and new wilderness trails.

Construction, maintenance and monitoring costs for all proposed infrastructure will be fully funded by the Turner Family. These funds are not dependent on finance, investor partners, economic cycles or other limiting factors.

2.1.2. The Experience

The Scenic Rim Trail will offer five days of walking following the escarpment in a north-south direction – mostly within National Park. The high altitude of the Scenic Rim provides for mild walking conditions for most of the year.

Walkers with 'Scenic Rim Trail' will be accompanied by two interpretive ecoguides, and walk on average 5-6 hrs/day (10.6 km). The Scenic Rim Trail uses private lands where possible for the Ecocamps. However, along the escarpment only National Park lands are suitable for the wilderness Ecocamps as alternative sites outside of the National Park would require significant and untenable deviation from the trail.

One Wilderness Ecocamp (Amphitheatre View) and one Ecocamp (Woodcutters) is required on National Park. Under the Gainsdale approach to eco accommodation Ecocamps are designed for up to 20 walkers/guests and Wilderness Ecocamps are designed for up to 10 walkers/guests in basic but comfortable accommodation. In the case of the Woodcutters Ecocamp and the Amphitheatre View Wilderness Ecocamp, accommodation for 10 walkers and two guides will be provided.

Ecocamps will be self-sufficient for energy, water and waste. These facilities are not available for public use. The buildings will be light frame and minimalistic with a small central communal building and individually placed camping pods placed between trees. All accommodation will be built and operated to a standard to achieve Ecotourism Australia's Advanced Ecotourism Certification.

The sections of the Scenic Rim Trail to be constructed by Gainsdale Pty Ltd would be developed to Class 5 Australian Standards – a class of construction most suitable for low use, wilderness environments, adopting low impact approaches to construction and signage.

Traversing in a one-way direction is consistent with most of the long range walking trails in Australia (e.g. Larapinta, NT; Australian Alps Walk, NSW; Overland Track, Tas; South Coast Track, Tas; Fraser Island Great Walk, Qld; Wilderness Coast Walk, Vic, NSW). One-way traversing provides walkers with an unlikely encounter with other walkers thus enhancing the wilderness walking experience.

2.1.3. Visitor Numbers

2.1.3.1. Gainsdale Pty Ltd Commercial Walkers

It is expected that for the six night/five day walk there will be an average of seven (7) walkers per departure, accompanied by two guides. The average number of departures will be two (2) per week for the first three years of operation and 3.5 per week from year four (4) on, for an estimated 44 operational weeks per year (leaving eight continuous weeks for rehabilitation in the summer months). Based on these assessments, the number of Scenic Rim Trail walkers (including guides) is 792 walkers per year in years 1-3 and 1386 walkers per year thereafter. Walkers would traverse in a north-south direction.

2.1.3.2. Independent Walking Public

It is proposed that use of the SRT by the general public be managed under permit by QPWS with a limit of 792 walkers per year in years 1-3 and 1386 walkers per year thereafter (i.e. the same numbers as Gainsdale). Permits would be issued for the same 44 week period as Gainsdale Pty Ltd operations. Walkers would be required to walk one way from north to south and to camp in QPWS identified bush camping sites (maximum of one night stay at each bush camp). The booking system and any fees for public permits would be managed by QPWS.

The above regime would result in a maximum of 1,584 walkers per year in years 1-3 and 2,772 per year thereafter. By comparison:

- the Grampians Peak Trail Master Plan (a mix of Class 3, 4 and 5 tracks) estimates 13,800 walkers in year one and 34,000 per year in 2025;
- Three Capes Walk was developed (to a class 3 standard) on the assumption of carrying 10,000 walkers during its walking season (September to May);
- Thorsborne Track (class 5) allows up to 3650 walkers per year – a maximum of 40 walkers on the trail at any time;
- Overland Track (class 3-5) attracts around 8,000 walkers per year (October to May);

The SRT most closely aligns with the Thorsborne Track in terms of walker numbers.

Members of the public using the SRT will require locations to obtain drinking water as they will not have access to the Gainsdale Ecocamps. Gainsdale is prepared to fund the establishment of water stations on National Park comprised of a small shelter and a water tank at:

- Mt Mistake near the Sunrise Lookout; and
- The Winder Track entry – some 13 km south

Selection of the exact location and construction of water stations would be the responsibility of QPWS.

There is a section of approximately 2 km of walking track required to be constructed following the eastern escarpment from the point where Gainsdale Pty Ltd walkers deviate to head west to the Woodcutters Ecocamp and then return to the escarpment re-joining it 2 km to the south. This track would not be used by Gainsdale guests. Gainsdale is prepared to build this section of trail as part of its contribution to the project. The alignment of this section will need to be surveyed and agreed in conjunction with QPWS.

Additional use of the Ecocamps will result from specialised short residential courses e.g. nature photography, rainforest identification, etc. These uses will be undertaken at times when SRT is not in use by Gainsdale walking guests. Such use will not involve use of the trail beyond the close environs. An allowance of 528 guests per year for non-SRT use of each of the two Ecocamps on National Park is estimated.

The Ecocamps would be engineered and designed to be able to accommodate additional visitor nights beyond the numbers above associated with conservation projects etc. Such use would account for an additional 240 people per year.

The existing walking tracks and the new walking tracks developed for the Project would be available for public use. QPWS considers that generally, remote camping is low in this area. The number of campers included in remote camping permits for the Main Range National Park from October 2015 to October 2016 was 427 camping nights. This figure is for the entire Park and does not reflect the number of track users as it is known that there are some day users that do not require permits.

2.1.3.3. Support Staff

Backing up the Gainsdale Pty Ltd walkers (and the two ecoguides) will be a back-up crew of up to two personnel who travel in advance of the walkers with their luggage and personal effects, fresh food and emergency equipment including first-aid. The support crew will go ahead to open up and prepared the Ecocamp and be on stand-by for any emergency situation. The support crew will return to the Ecocamp the following morning, clean the Ecocamp in preparation for the next group and then transfer luggage and fresh food supplies to the next evenings Ecocamp.

These activities will involve the following vehicle movements:

- To Mt Mistake Farmhouse on Day 1- by 4WD minibus and transferring equipment into an 4WD ATV (using public and private roads);
- To Amphitheatre View Wilderness Ecocamp on Day 2 via The Winder Management Road 4WD ATV (on National Park roads);
- Woodcutters Ecocamp via Lookout Road and Dalrymple Track on Day 3 by 4WD ATV 9 (on National Park roads);
- Woodcutters Ecocamp to Goomburra by 4WD ATV (on National Park roads), transfer gear to road registered 4WD minibus and drive to Hidden Peaks Ecocamp on Day 4 (on public roads);
- Drop walkers to Cunningham's Gap by 4WD minibus and then drive to Canopy Ecocamp on Day 5 (on public and private roads);
- Return walkers and luggage to Hidden Vale by 4WD minibus on the morning of Day 6 (on public and private roads).

These vehicle movements will be associated with each departure – therefore in years 1 to 3 the average number of departures will be two (2) per week and 3.5 per week from year four on.

In addition to these vehicle movements there will be scheduled and emergent, non-scheduled need to undertake maintenance of the re-opened Winder Road – for any road or track repair along this alignment, trimming of overhanging vegetation within the 2.5 m path; removal of fallen trees, etc. It could be assumed that an average of one vehicle movement per week would be associated with such maintenance.

The other National Park roads (that are not public roads) i.e. the northern fire trail immediately south of the Mt Mistake farm; the Dalrymple Track, the Western Management Road and the Banshee Fire Trail will be used by SRT Ecocamp service crews, periodic sewage tank pump out, periodic building maintenance, rehabilitation planting establishment, downed tree removal, etc. It could be assumed that there would be an average of one Gainsdale Pty Ltd vehicle movement per week on each of these roads.

Gainsdale is committed to achieving all weather access to Amphitheatre View Wilderness Ecocamp and Woodcutters Ecocamp.

2.1.4. Supporting Park Management Priorities

The 2013 Management Statement for the Main Range National Park makes significant reference to the role of the Main Range in nature-based recreation, from remote walking and camping through to developed camping grounds and high-use, popular walks.

Gainsdale Pty Ltd sees this project as a cooperative and collaborative effort with the QPWS. The concept builds on the existing QPWS trail system and those sections of the trail that are constructed by Gainsdale Pty Ltd will be open to public use in the same way (and under the same policies) as QPWS constructed trails. In order to retain a cooperative and collaborative approach to the Project a Project Reference Committee would be formed.

2.2. GAINSDALE PTY LTD

2.2.1. Turner Family Conservation Projects

The work of the Turner Family (via Gainsdale Pty Ltd) in conservation on its Nature Refuges and the planned work in wildlife management with the University of Queensland will be complementary to the Scenic Rim Trails concept.

The Turner Family wants to develop partnerships between landowners and protected area managers along Main Range to contribute to the Great Eastern Ranges concept from North Queensland to Victoria. The Scenic Rim Trail will be an important contribution to presenting the natural and cultural heritage values of this range system.

The Directors of Gainsdale Pty Ltd, Graham and Jude Turner, own 8,000 ha in the northern section of the Scenic Rim adjoining Main Range National Park and their vision is influenced by the Great Eastern Ranges corridor concept (Mackey *et al.* 2010). Three Nature Refuges have been established on these properties, totalling nearly 5,500ha protecting these lands in perpetuity through Conservation Agreements:

- Spicers Peak Nature Refuge established in 2006 and comprising 2000ha. It has a seven kilometre boundary with Main Range National Park.
- Old Hidden Vale Nature Refuge – established in 2007, 3091 ha. Part of this Nature Refuge includes Old Hidden Vale Koala Habitat – established in 2012.
- Thornton View Nature Refuge – established in 2006, 320 ha of Brush-tailed Rock-Wallaby habitat and breeding sites for raptors such as Peregrine Falcon.

Gainsdale Pty Ltd has formed a partnership with University of Queensland in an innovative program to support wildlife conservation. This involves a multi-million dollar research and monitoring facility funded by the Turner family (Appendix 2). It is intended that the facility will direct specific attention to breeding programs associated with the identified rare and threatened species in the region, including the Brush-tailed Rock-Wallaby, Long-nosed Potoroo, Hastings River Mouse, Spotted-tailed Quoll and Eastern Bristlebird.

Gainsdale Pty Ltd has also recently entered into a funding agreement to complete essential habitat mapping for the Brush-tailed Rock-Wallaby in partnership with Healthy Waterways and Catchments Ltd.

2.2.2. Turner Family Approach to Tourism

The Turner Family's approach to tourism is characterised by quality, authenticity and intimacy. They have a passion and driving commitment to see the development of the Scenic Rim as a conservation and ecotourism resource of world significance – developing over time, an iconic status.

Across their existing properties the experience is centred on the natural and cultural heritage values of the environs. Attributes such as fine local foods and wine, employment of local people, activities that link to the individual values of the site and the involvement of guests in conservation elements of the properties then add to the total experience.

The Turner Family would wish to work with the Traditional Owners to present their country and culture in a way that provides benefits to the local community and a valuable ecotourism experience. It is also planned to involve guests in conservation related programs, working in association with groups like Conservation Volunteers Australia.

The Turners see the Scenic Rim Trail and their existing tourism assets as an important contributor to the local economy and hopefully a catalyst for a significant range of new ecotourism products in the region.

2.2.3. Experience, Skills and Capability of the Turner Family

The Turner Family owns and operates ten small luxury lodges in Queensland and New South Wales. This portfolio of small luxury hotels is being expanded as strategically located and appointed properties become available.

The Turner Family brings considerable tourism industry experience, as the founders of the globally successful business, Flight Centre - a company employing over 16,000 staff worldwide. They have six years' experience in running three and four day walks in the region and 15 years' experience operating ecotourism and small luxury lodges in the area. Consequently they have extensive relationships with neighbours and stakeholders, an understanding of the operating conditions and good local knowledge of the landscapes.

The SRT proposal is a long-term project that seeks to put something back into the conservation of the Scenic Rim and public enjoyment of this significant area. Based on purely commercial grounds the level of investment proposed for this project would be difficult to justify. The medium term financial objective established is operational cost recovery only.

2.2.4. Project Funding Structure

Construction, operation, management and maintenance costs will be fully funded the Turner family. These funds are not dependent on finance, investor partners, economic cycles or other limiting factors.

2.3. THE TRAIL

The design intent is to create a long range walking trail, associated Ecocamp and Wilderness Ecocamp sites with minimal impact upon the environment. The walking trail is designed for backcountry remote walking and will involve minimal 'hardening' of the trail and minimal signage. The focus of the walk will be on the natural and cultural heritage values of the World Heritage Area.

The design intent is to create a long range walking trail, associated Ecocamp and Wilderness Ecocamp sites with minimal impact upon the environment. The focus of the walk will be on the natural and cultural heritage values of the World Heritage Area. The walking trail is designed for backcountry remote walking and will involve minimal 'hardening' of the trail and minimal signage. Signage will be limited to entry signage at the Trailhead; minimal directional signage at key intersections for walkers heading south. Additional signage will be required at:

- Bare Rock;
- Sylvester's Lookout;
- Mt Castle Lookout;

- The end of the current Winder Track; and
- Banshee Fire Line.

The World Heritage Values of the area are paramount to the experience being proposed by the Turner Family. At all stages of this project steps will be taken to protect the heritage values, both cultural and natural. This is being achieved through a range of initiatives, which each contribute to the protection and conservation of the area:

- acquisition of adjoining, broad acre private lands which will contribute to the total stock of conserved land and provide a buffer to the World Heritage Area;
- sustainable management of these adjoining lands so as to ensure protection of habitat for endemic species and the control of weed species;
- significant contribution to the science and practice of breeding endangered and vulnerable wildlife through the University of Queensland Breeding Facility at the Turner's Hidenvale property. This project involves the Turner's funding \$6M+ for the wildlife facility (which will soon open) and a 30 year commitment by the Turners to its ongoing operation as a teaching and research centre;
- limiting use of the Trail to small groups (up to 10 guests) and limited departures per week, with operations scaled back in the summer months (prime growing season);
- involvement of a group of leading specialists in natural and cultural heritage assessment, ecotourism planning and development, sustainable architecture, fire management and heritage interpretation;
- committing to ongoing monitoring, management and maintenance of the trails and tracks over the life of the project;
- commitment to benchmark and ongoing periodic monitoring of key species identified in this report; and
- Cooperative approaches to pest and weed management across land tenures.

Expert ecoguides will deliver interpretation on the trail. The ecoguides will be highly trained. At times the trail will be led by renowned experts from a broad cross section of disciplines to provide guests with a rich understanding of the region's values. Experts will be drawn from local and national universities, research organisations and community groups.

Specialist walks that focus on nature photography, bird watching, indigenous foods, and many other natural and cultural history themes will be offered.

It is also planned to invite guests to become involved in conservation related programs on the SRT, working in association with groups like Conservation Volunteers Australia.

2.3.1. Trail Standard and Route Selection

The Australian standard walking track grading system ranges from Class 1 as a highly developed and hardened track to Class 5 where minimal disturbance is made to create a path, steep grades may be involved and little or no signage is provided by way or markers (refer Users guide to the Australian Walking Track Grading System, Department of Land, Water and Planning, Victoria). It assumes that walkers are experienced and have navigation skills. The intention is to establish the Scenic Rim Trail to Class 5 Australian Standard. Examples of the likely appearance of Class 5 trails within the project area after a period of use are shown in Photos 4 and 8 (Section 3.2.3). There will be minimal use of route markers as groups will be accompanied by experienced ecoguides who will be responsible for navigation. Limited sections of trail may need to be constructed to Class 3 or 4 standards to take into account environmental constraints and hiker safety. Parts of the trail where more intensive track work is recommended are shown on Figures 2.2, 2.4 and 2.6.

The alignment of the Scenic Rim Trail is constrained by the narrow nature of the crest of the Mistake and Main Ranges within much of the proposal area. Consequently large sections of the route are located close to the eastern escarpment. The extensive forestry operations that occurred in this area over many decades resulted in a network of snig tracks, fire lines and logging access roads generally following the line of least gradient. These old tracks are utilised wherever possible.

The route between Thornton and Mt Mistake Farmhouse (a distance of some 5.7 km) commences with a short, newly constructed walking track until it reaches a cliff line of some 20-25 m in height. An engineered enclosed ladder (or similar) will be attached to this cliff to enable walkers to gain access to the escarpment. The trail then proceeds south following the escarpment, largely following pads formed by cattle which follow the top of the escarpment and the Mt Mistake Farmhouse. While the management road follows a similar alignment, it is not visible to walkers except for two short sections of 100-200m.

From the Mt Mistake Farmhouse to the first Wilderness Ecocamp, Amphitheatre View Wilderness Ecocamp, walkers will follow a fire trail management track, then an old forestry road which runs for approximately 6.5 km before joining The Winder walking track (which was originally part of the old Forestry Road). The Winder walking track is followed for 4.7km before branching off to a connector track into the ecocamp. The total walking distance for this day is approximately 14km.

From Amphitheatre View Wilderness Ecocamp to the next Ecocamp, Woodcutters Ecocamp, walkers will use a combination of management roads, existing class 4 walking tracks and new sections of class 5 walking track. The total walking distance for this day is approximately 9 km.

Woodcutters Ecocamp to Cunningham's Gap uses a combination of fire trails, old snig tracks, new class 5 walking track and existing class 3-4 walking track. The total walking distance for this day is approximately 13 km. For the public using the SRT, the conclusion of the Trail will be Cunningham's Gap. Walkers with Gainsdale Pty Ltd will then be picked up and driven down to the Hidden Peaks Ecocamp on Gainsdale Pty Ltd land. The following morning they will be driven back up to Cunningham's Gap and dropped off for the walk to Canopy Ecocamp.

For guests of Gainsdale the SRT will continue on the Mt Mitchell track, then take a short connector track (approximately 450 m) onto the Spicers Peak Nature Refuge. Walkers will then be guided along the existing track to Canopy Ecocamp. The total walking distance for this day is approximately 11 km.

The trail has been ground-truthed and points recorded at approximately 100 m intervals using a hand-held GPS for all new sections of track. Relevant physical and biological data were recorded along the route. Options for difficult parts of the route were investigated to find alternatives that would lessen any impacts on the environment.

Part of the route follows the former forestry road, which ran from Mt Castle Lookout Carpark to the north past The Winder to the northern boundary of the national park. The disused road would be re-opened to create a narrow corridor suitable for ATVs for logistics and management (Winder Management Road). Deviations from the corridor alignment would occur for short sections of the walking trail to enable walkers to reach viewpoints and interesting tree species, etc. These deviations would be constructed to Class 5 trail standards.

Suitability of and Access to the Site

The site/s involved have limited access due to the steep nature of the country and the limited road access— based around three entry points at Cunningham's Gap, Goomburra Valley and Thornton/Mt Mistake.

The Scenic Rim has long been identified as premium country for bushwalking and camping. However without question the remoteness of the area and issues such as fire management precludes large-scale tourism operations within the sections of National Park being examined.

Identified Site Constraints

There are a number of site constraints that apply across the project as a whole:

- limited road access as discussed above;
- remoteness – limited telephone communication coverage and difficulty to evacuate walkers from areas without adjoining management roads;
- sub-tropical climate – resulting in less than favourable walking conditions in summer (but balanced by the high altitude locations of the trail and Ecocamps);
- some sections of steep and rocky trail;
- limited clearings where camps can be established;
- limited water availability in the high country sections without having to descend into creeks;
- localised fire management issues, protection of life and assets in a fire emergency;
- existing though relatively limited weed infestation in some areas as a result of previous forest management practices and maintenance of disturbance regimes in open, sunny situations.

While a long distance iconic walking trail is the main objective, other recreational forms such as environmental education and conservation programs with external partners would occur at the Ecocamps independent of the Trail walkers.

The linear nature of this proposal (some 53 km) and the associated Ecocamps will take considerable inputs to construct. The trail will be built to a Class 5 grade under Australian Standards and generally consisting of a narrow trail suitable for single file walking.

2.3.2. Existing Walking Tracks and Management Roads used in association with the Scenic Rim Trail

The existing National Park walking tracks (and their approx. lengths) that form part of the Scenic Rim Trail include:

- Bare Rock to Cunningham's Gap walking track – 6.1 km
- Cunningham's Gap to Mt Mitchell walking track – 4.8 km
- A section of the Cascades and Ridge Tracks - 1.8 km
- Part of the existing Winder Track walking track - 4.7 km
- Mt Castle Lookout walking track 0.4 km.

The existing National Park management roads and fire trails include:

- Mt Castle Western Fire Line from Amphitheatre View Wilderness Ecocamp to Mt Castle Lookout - 2.7 km
- Northern Fire Line from northern boundary of Main Range National Park south to the northern end of the old Winder Management Road -1.5 km
- Banshee Fire Trail – 1.5 km.
- The existing Gainsdale Pty Ltd walking tracks (and their approximate lengths) that form part of the Scenic Rim Trail include: The track from the QPWS Mt Mitchell link track to Canopy Ecocamp – 4.6 km.

In addition Gainsdale Pty Ltd would require vehicular access to:

- the Cascades Circuit (the management road section) from Manna Gum Camping Area to the

Woodcutters Ecocamp for servicing of guests and maintenance of the Ecocamp 2.5 km

- Amphitheatre View Wilderness Ecocamp using the Mt Castle Western Fire Trail track – 2.3 km.

Gainsdale will upgrade these two roads to enable more reliable access in wet weather conditions. Subject to QPWS approval the drainage would be rectified and gravel surfacing would be upgraded where required. Such work would not entail road widening. Only those sections of the road that require resurfacing will be upgraded. Periodic grading would be undertaken to maintain the roads in good condition.

The Ridge Track and Banshee Fire Line will not require upgrading but will be accessed periodically to deal with fallen trees in line with QPWS protocols.

Re-opening and maintenance of a 2.5 m wide management road and walking trail of the Winder Management Road will be undertaken by Gainsdale Pty Ltd. The road will be upgraded in line with the approach set out in Appendix 12 *Construction Environmental Management Plan – Reopening of the Winder Management Road*.

A weed management plan will be developed and implemented for the track with a focus on monitoring and removing weeds that may enter the track and the control of existing weeds at the north and south entry points.

2.3.3. New Trails

The new trails to be constructed on National Park as part of the Scenic Rim Trail are:

- 5.7 km of Class 5 walking trail (and shared All Terrain 4WD Vehicle road) from the southern end of the Northern Fire Trail to the northern end of the existing Winder Track. This section is known as the Winder Management Road and involves some sections of new class 5 trail running roughly parallel to the Winder Management Road to enable walkers to experience viewpoints, differing vegetation types and interesting specimen trees.
- 1.2 km of Class 5 trail to link from the Winder Track to the Amphitheatre View Wilderness Ecocamp;
- 4.5 km of Class 5 trail between Mount Castle Lookout and the Cascades Trail;
- 4.9 km of Class 5 trail from Banshee Fire Line to Bare Rock; and
- 0.5 km upgrade to Mt Mitchell track to Spicers Peak Nature Reserve – no new vegetation disturbance.

The new trail to be constructed on Gainsdale properties as part of the Scenic Rim Trail includes:

- 5.7 km of Class 5 trail between Thornton Trailhead and Mt Mistake Farmhouse (freehold).

The maintenance and monitoring of all new trails (including weed and feral animal management under agreed protocols with QPWS) will be the responsibility of Gainsdale Pty Ltd.

In all, a total of approximately 23 km of predominantly Class 5 track (5.7 km on freehold tenure and 17.2 km on National Park) would be constructed by Gainsdale Pty Ltd. The maintenance and monitoring of all new trails, including weeds and feral animals, will be the responsibility of Gainsdale Pty Ltd.

2.3.4. Trail Route

The entire trail route is shown in Figure 1.1.

2.3.4.1. Trail Route: Thornton Trailhead to Mt Mistake Farmhouse

The 5.7 km section of trail from Thornton Trailhead to Mt Mistake Farmhouse shown on Figure 2.1 traverses freehold tenure. A class 5 trail is planned, although short sections on the eastern escarpment of the range will need to be constructed to a higher standard to minimise erosion and hiker injury risk. This will include the use of an enclosed ladder section to ascend a rock outcrop. This is the steepest part of the route and involves a vertical climb of around 350 m. The eastern side of the Mistake and Main Ranges between Cunningham's Gap and Thornton has a near-continuous cliff line. The point at which the trail accesses the crest of the range (Figure 2.2) lies at the northern extremity of the cliffline. At this point it is low (around 20-25 m high) and broken, providing a suitable site for construction of safe access using steps or an enclosed ladder. After reaching the crest the trail tracks along the eastern scarp for around 4.5 km to Mt Mistake Farmhouse. The route avoids the road from Main Camp Creek to the ecocamp. The scarp is relatively open country for much of the journey, affording views to the east.

The ascent of the escarpment commences shortly after leaving the Thornton Trailhead car park. There are several short steep sections near the base of a narrow ridge which is used to provide the trail alignment to the base of the cliffline. The grade of the ridge then becomes less steep (20-24°) for much of the ascent until approaching the cliff base where it increases to 45°. The gentler grades will not require any ground disturbance for placement of a class 5 trail. However, steeper sections of the ridge ascent will require track construction to provide safe access and to minimise erosion risk (Figure 2.2).

The vegetation from the Trailhead to the base of the cliff is a *Eucalyptus* Woodland (RE 12.8.16; see Figure 3.1, Section 3.2.3). The main trees include Narrow-leaved ironbark *Eucalyptus crebra* and Forest Red Gum *E. tereticornis*. Blue-leaved Grass Tree *Xanthorrhoea glauca* is a conspicuous feature of the understorey. Ground layer vegetation is influenced by cattle grazing at lower altitudes. The large tussock-forming grass Wild Sorghum *Sorghum leiocladum* is often the major species in the ground layer. When in flower in late spring – early summer swards produce an impressive display with maroon-coloured flower heads borne on stems up to 2 m high.

The trail along the crest of the range traverses open grassy country for much of the way. Animal pads (cattle and possibly macropods) are conspicuous along this section of the route (see Photo 8 Section 3.2.3). They can form the basis for the trail and minimal input will be required to accommodate use by hikers. The scarp section ascends two small peaks. The first has a long, relatively steep gradient; however, an animal pad along the eastern flank provides a useable pathway. The second peak which is around 1 km north of Mt Mistake Farmhouse has a more gentle gradient – once ascended the going is relatively flat for the remainder of the journey. Most of the scarp is fenced – the route tends to stay on the eastern (scarp) side of fences. Cattle access the scarp where fences are in disrepair and parts of the route along the crest of the range have been influenced by cattle grazing.

The vegetation along the crest is predominantly RE 12.8.14 a *Eucalyptus* ecological community characterised by Grey Gum *Eucalyptus biturbinata*, Forest Red Gum and Thin-leaved Stringybark *E. eugenioides*. The vegetation structure varies with exposure. In exposed situations it is reduced to low open grassy Woodland while a tall layered Open Forest grows in sheltered situations. Tree height also increases towards Mt Mistake Farmhouse as conditions become moister with increasing altitude. The trail traverses a small patch of RE 12.8.9 Brush Box *Lophostemon confertus* forest on the southern side of the peak 1 km north of Mt Mistake Farmhouse. Rock pavements which form RE 12.8.19 are present close to the trail route. Spear Lily *Doryanthes palmeri* tends to mark the break of slope where the crest starts to fall steeply above cliff lines. Spear Lilies are visible along much of the trail alignment. Their large red flowers provide a spectacular display in early spring when the long cream flower spikes of Blue-leaved Grass Tree are also present along parts of the route.

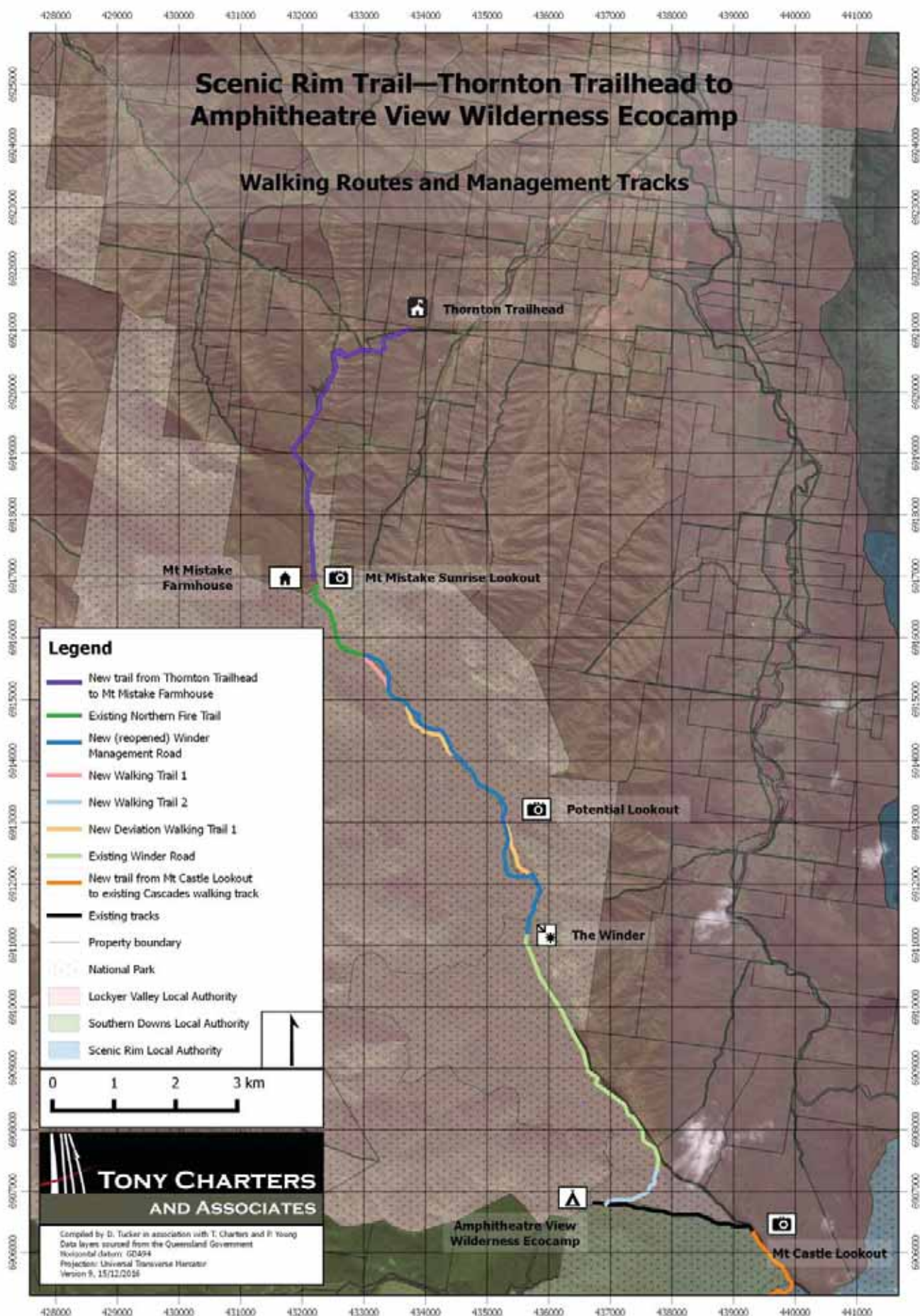


Figure 2.1 – Route from Thornton Trailhead to Amphitheatre View Wilderness Ecocamp

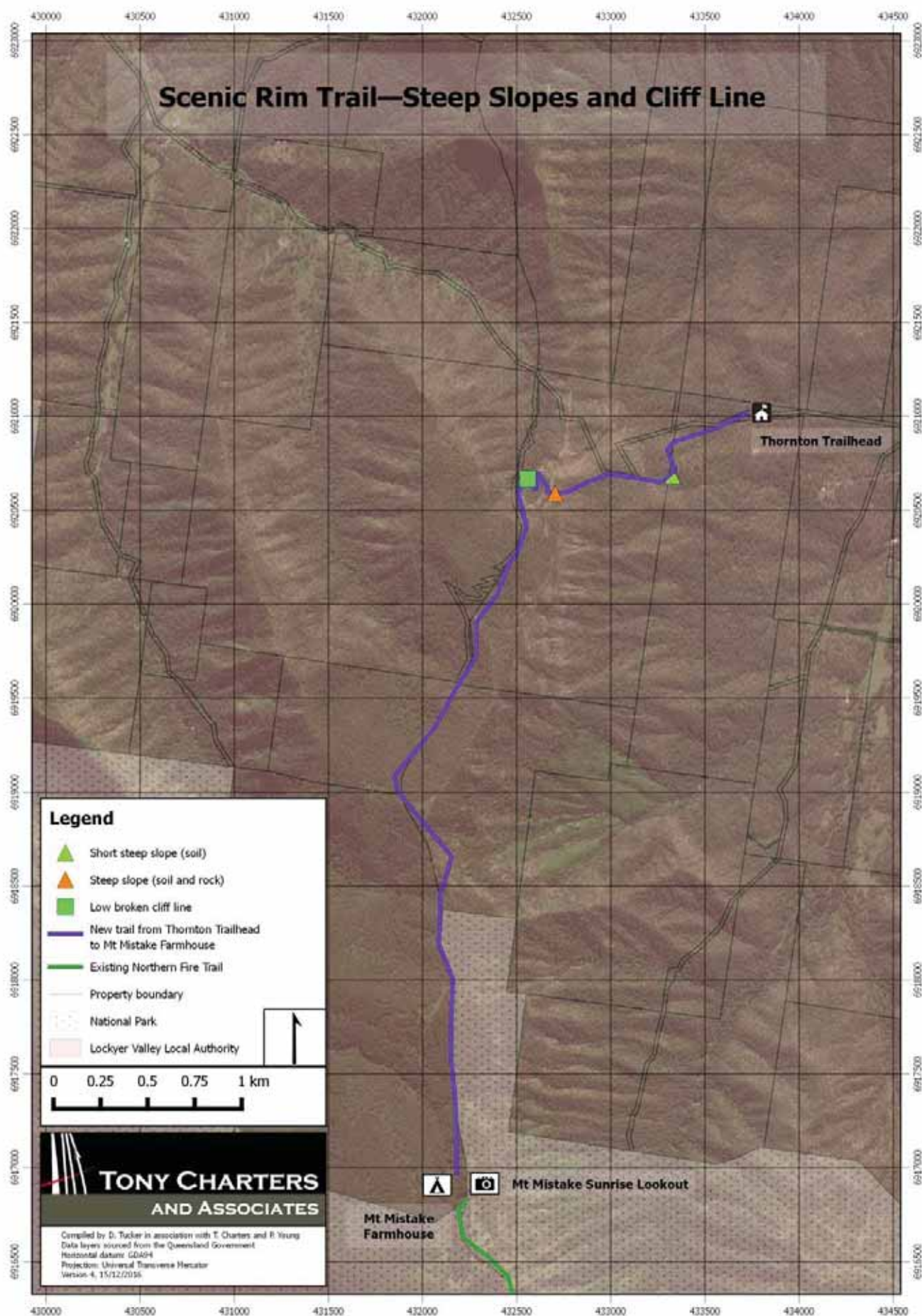


Figure 2.2 – Thornton Trailhead to Mt Mistake Farmhouse showing steep sections

2.3.4.2. Trail Route: Mt Mistake Farmhouse to Amphitheatre View Wilderness Ecocamp

This section of the trail is approximately 14.1 km long. After leaving Mt Mistake Farmhouse the route first traverses cleared grazing country on freehold land for 0.3 km before entering Main Range National Park (Figure 2.1). It then follows the Northern Fire Line through Eucalyptus Open Forest for approximately 1.5 km. The track then becomes impassable where there is a boundary between the Eucalyptus Forest and Rainforest. The disused section of the former Winder forestry road then follows the crest of the Mistake Range for approximately 6.5 km. The former road is located 500-600 m inland from the scarp for much of the journey. Consequently there are few points with views. The road was formed on deep, red and brown loamy to clay-loam soils (krasnozems/ferrosols). It remains best preserved where earthworks were undertaken, for example cuts into the sides of slopes along, or at angles to the contour to reduce the grade, and where construction and use has formed a shallow “u”-shaped furrow in the ground surface. In these situations a clear linear “tunnel” is often apparent under the tree canopy. The road surface has been colonized by a dense cover of Shield Fern *Lastreopsis decomposita*, the sprawling shrub Pepper Bush *Tasmannia insipida* and vines, shrubs and trees. The succulent-leaved herb *Pollia Pollia crispata* forms dense patches where the former road surface stays damp following rain from seepage and shelter. Tree Ferns have also colonised moister sheltered places. The steeper sections of roadway cut into hill-slopes have generally held up well to wash and erosion. However, there are some sections where water flow on longer sloping sections has gouged channels and gutters. The surviving parts of the road are around 3.5-4 m wide.

The road traverses logged rainforest in varying stages of recovery. It was found to become obscure or could not be re-located in places that appear to have been heavily logged or disturbed. These sections are gently sloping crests and foot-slopes of ridges and would have been amenable to falling and hauling large trees and positioning log dumps for storage of snigged logs.

The rainforest canopy remains very broken and uneven at these sites and there is often dense low growth of ferns, shrubs and vines which impede progress on foot. Giant Stinging Tree *Dendrocnide excelsa* is a common species at these sites. Despite the past disturbance, the vegetation is largely weed free and the altitude remains too high for establishment of the widespread rainforest weed *Lantana Lantana camara*.

The rainforest traversed is predominantly Cool Subtropical Rainforest apart from highest ridges where it starts to transition to Warm-Temperate Rainforest. The route also crosses the highest point on the Mistake Range (1060m) where there is a brief view of distant Mountains. The eastern scarp is not visible until 1.4 km north of “The Winder”, the remains of a truck-Mted winch. The route then joins the Winder Trail south from “The Winder” and is used to provide part of the final stage of the route towards the Amphitheatre View Wilderness Ecocamp. Trail Route: Deviation (Class 5 Trail) from the Winder Trail to the Amphitheatre View Wilderness Ecocamp (4.7 km).

The new section of walking trail (shown in Figure 2.3) provides a shorter path (1.2 km) for hikers from the southern end of the Winder Trail to Amphitheatre View Wilderness Ecocamp. This route is recommended given the long distance of walking involved on this day and to avoid backtracking on the same path the following day. It passes through relatively undisturbed rainforest on a steep, sheltered slope on descent into a deeply incised headwater tributary of Blackfellow Creek. This is one of two permanent to semi-permanent creek crossings on the entire National Park section of the trail. It is recommended that a constructed path is built into the steep earth banks of the creek to minimise trampling, soil disturbance and localised sedimentation of creek water. A creek crossing of stepping stones shall be constructed to avoid soil disturbance in the creek. The route from the creek to the exit point near Amphitheatre View Wilderness Ecocamp then passes through logged Cool Subtropical Rainforest.

2.3.4.3. Trail Route: Amphitheatre View Wilderness Ecocamp to Woodcutters Ecocamp

The route from Amphitheatre View Wilderness Ecocamp to Woodcutters Ecocamp is approximately 9.3 km long and uses new and existing trails and roads. Selection of the route alignment is constrained by the topography which comprises the steep scarp on the eastern side and steep east-west oriented valleys on the inland side.

The Mt Castle West Fire-line is used to provide access from the Amphitheatre View Wilderness Ecocamp to Mt Castle Lookout carpark, where there is a short walking track through undisturbed Cool Subtropical Rainforest to Mt Castle Lookout. The trail route departs the National Park walking track at the Lookout (Figure 2.3) and climbs a long slope with the rainforest changing gradually with altitude from Cool Subtropical Rainforest to Lilly Pilly *Acmena smithii* Warm-Temperate Rainforest. This is the first patch of well-developed Warm-Temperate Rainforest traversed along the north-south route. Near the exposed summit the canopy becomes low and there is a dense, viny understorey which impedes progress on foot. This is typical of aspects facing prevailing winds along the scarp through to Bare Rock. The exposure to high winds also results in constant tree and branch fall.

The route connects with a rough track near the highest point on this section (1120 m). The trail provides access to Hole-in-the Wall on the Little Liverpool Range towards Mt Castle. It descends along a steep, boulder-strewn slope before approaching Sylvester's Lookout. This steep slope provides a useful reference, as the new trails will descend similar bouldery slopes further south. Although the route is close to the eastern scarp most of the way there are only brief glimpses of scenery.

Mt Castle Lookout approximates the point where the Main Range commences, heading southwards towards Cunningham's Gap and beyond. The Great Dividing Range heads westwards and the Mistake and Little Liverpool Ranges continue to trend northwards. The narrow ridge on which the Amphitheatre View Wilderness Ecocamp is situated is the summit of the Great Dividing Range.

After leaving Sylvester's Lookout the new trail tracks close to the eastern scarp before reaching a point where a westwards-oriented spur provides access to the existing Cascades Trail (Figure 2.3). After leaving Sylvester's Lookout, the route firstly climbs through unlogged Cool Subtropical Rainforest with a high stocking of Red Cedar *Toona ciliata* – this probably resembles many parts of Goomburra – Mistake Range prior to logging as Red Cedar was a heavily targeted species. The trail then climbs through lower-stature viny rainforest in transition from Cool Subtropical Rainforest to Lilly Pilly Warm-Temperate Rainforest. The southern side of the high point is steep and rocky in places before becoming more undulating and dropping into a sheltered saddle with a tall unlogged patch of Cool Subtropical Rainforest.

The route then climbs again before accessing a short westwards facing spur. The spur represents the only viable option in the vicinity for providing a link between the scarp and the Cascades trail which is 1000 m to the west. A patch of unlogged 40-45 m tall Wet Sclerophyll Forest is traversed along the end of the spur before it descends steeply towards the Cascades. There is an extremely steep, short slope (40°) before passing into a dense Palm Forest Piccabeen Palm *Archontophoenix cunninghamiana* on a gentle footslope subject to seepage. The short, steep section above the Palm Forest requires placement of a contoured track to avoid dislodgement of soil and surface rocks. After exiting the Palm Forest, the descent then becomes steeper again and traverses another distinctive patch of Wet Sclerophyll Forest which has a Hoop Pine (*Araucaria cunninghamii*) sub-canopy. The understorey is easily traversed although the terrain is steep (30-34°). The last section of slope before accessing the main watercourse at the Cascades is extremely steep and unstable. It will require construction of steps (or a combination of steps and contouring) to mitigate erosion and slips. Figure 2.4 shows the two locations where the trail will need to be constructed for safety and stability.

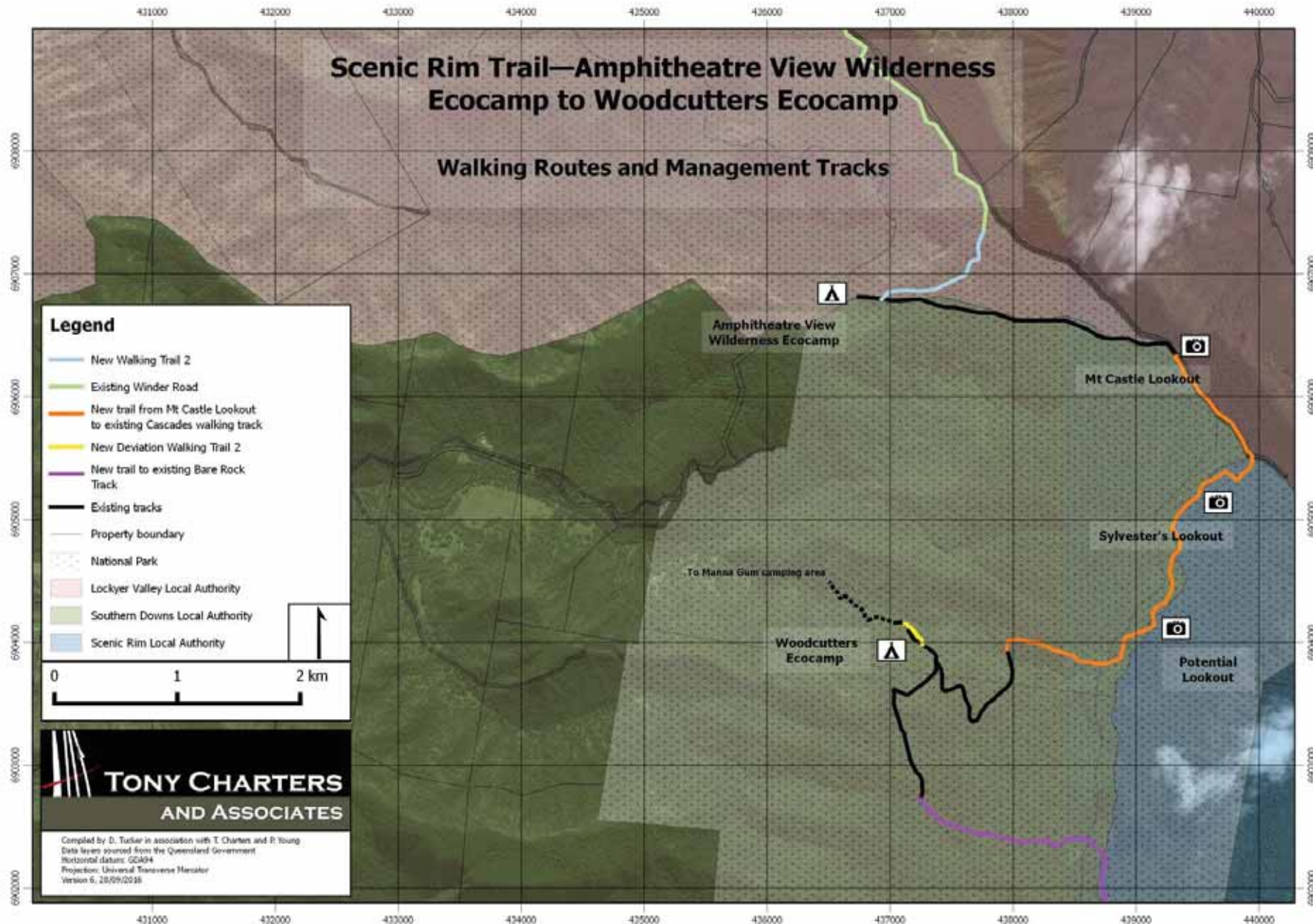


Figure 2.3 Amphitheatre View Wilderness Ecocamp to Woodcutters Ecocamp showing walking trails.

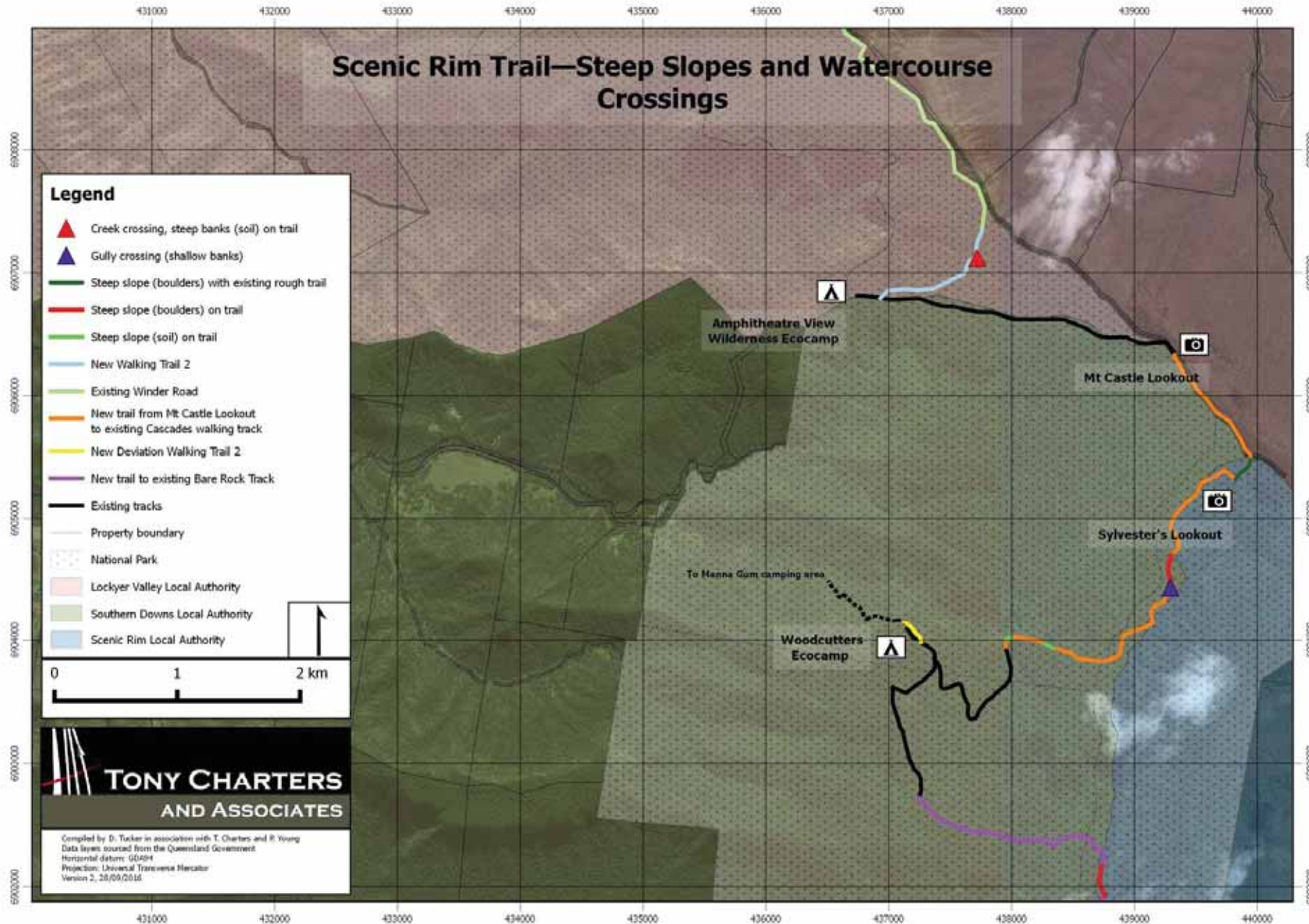


Figure 2.4 Amphitheatre Wilderness Ecocamp to Woodcutters Ecocamp showing steep sections and watercourse crossings

The point used to access the Cascades Trail (junction of orange and black trails on Figure 2.4) was the only suitable place located, as the Cascades creek system (main creek and several tributaries) is heavily incised with sheer basalt walls. The shallow creek crossing on a water-worn basalt base is one of two crossings of permanent-semi-permanent watercourses along the entire National Park section of proposed new trail (other location shown on Figure 2.4). The creek is then forded a number of times along the Cascades Trail between the access point and Woodcutters Ecocamp, a distance of 1.8 km.

The section of much of the route from Sylvester's Lookout to the Woodcutters Ecocamp is outstanding because of the diversity of vegetation traversed and the natural condition of the area due to its inaccessibility to logging. The scarp is exposed to high winds and localised patches with dense vines bear evidence of wind damage. Some recent tree fall, death of veteran trees and landslips are present along the route. These all reflect natural processes rather than human impacts. It also traverses a patch of ancient rainforest trees with basal damage which suggests that a fire many years before present may have entered the rainforest from the scarp and burnt through the litter on the rainforest floor. The route is free of serious weeds. Areas of disturbance caused by tree fall and landslips are being colonised by native species. The only weeds noted were small number of short-lived Asteraceae (daisy) species and Blackberry Nightshade *Solanum nigrum*. These species are unable to persist under a shaded canopy and are absent away from the disturbance.

2.3.4.4. Trail Route: Woodcutters Ecocamp to Spicer's Peak Nature Refuge

After leaving Woodcutters Ecocamp there is a short backtrack (330 m) along the Cascades Trail to the junction with Ridge Trail. The Ridge Trail and Banshee Fire Line are traversed for 1.5 km to the start of the new 4.9 km section of Class 5 trail to Bare Rock (Figure 2.5). A former logging road is initially followed for a short distance. The track becomes indistinct after 0.5 km and the route maintains an easterly direction through logged rainforest along a ridge. There is a final climb to the scarp through viny transitional Cool Subtropical Rainforest-Warm-Temperate Rainforest. The scarp is reached near a local high point (1070 m). The route south commences with a steep rocky descent similar to the slope traversed by the existing Class 5 trail north of Sylvester's Lookout (marked red on Figure 2.6). It then passes into a deep saddle containing very tall, undisturbed Cool Subtropical Rainforest with a sub-canopy of Piccabeen Palm and abundant Walking Stick Palm in the understorey. The route then commences a long climb which transitions into Warm-Temperate Rainforest and altitude remains >1000 m through to Bare Rock (1160 m). A bushwalker's footpad is evident intermittently along this part of the route. The ridge is narrow in places and these areas are covered in vines and difficult to traverse. The location of the Class 5 trail just under the ridge (inland side) will enable viny patches to be detoured. The unlogged and logged sections of the route are free of serious weeds. There is some localised pig damage in places.

The final climb to Bare Rock traverses good examples of Warm-Temperate Rainforest heavily festooned with mosses. The end of the new trail network, Bare Rock, is a rock pavement covered in places by montane heathland, the only such vegetation traversed. There is an existing path over the rock and other localised disturbances from hikers. Detouring Bare Rock to prevent damage to the shrubby vegetation does not appear feasible because of its sheer to very steep rock walls. The summit provides 360° views. The trail then links with National Park walking track to Cunningham's Gap.

The trail then links with 10.85 km of the existing National Park walking tracks to the Mt Mitchell eastern summit. A short connector trail of some 0.5 km links from that track to the Spicers Peak Nature Refuge and on to the Canopy Ecocamp. The connector traverses tall, old growth type RE 12.8.14 with large trees of Thin-leaved Stringybark *E. eugenioides* Grey Gum *Eucalyptus biturbinata* and New England Blackbutt *E. andrewsii*. The trail route then continues downslope towards Canopy Ecocamp traversing further examples of RE 12.8.14 as well as RE 12.8.16 Narrow-leaved Ironbark *Eucalyptus crebra* Woodland, RE 12.3.9 Ribbon Gum *Eucalyptus nobilis* Open Forest and cleared and semi-cleared grazing country which was formerly *Eucalyptus* Woodland (predominantly RE 12.8.16).

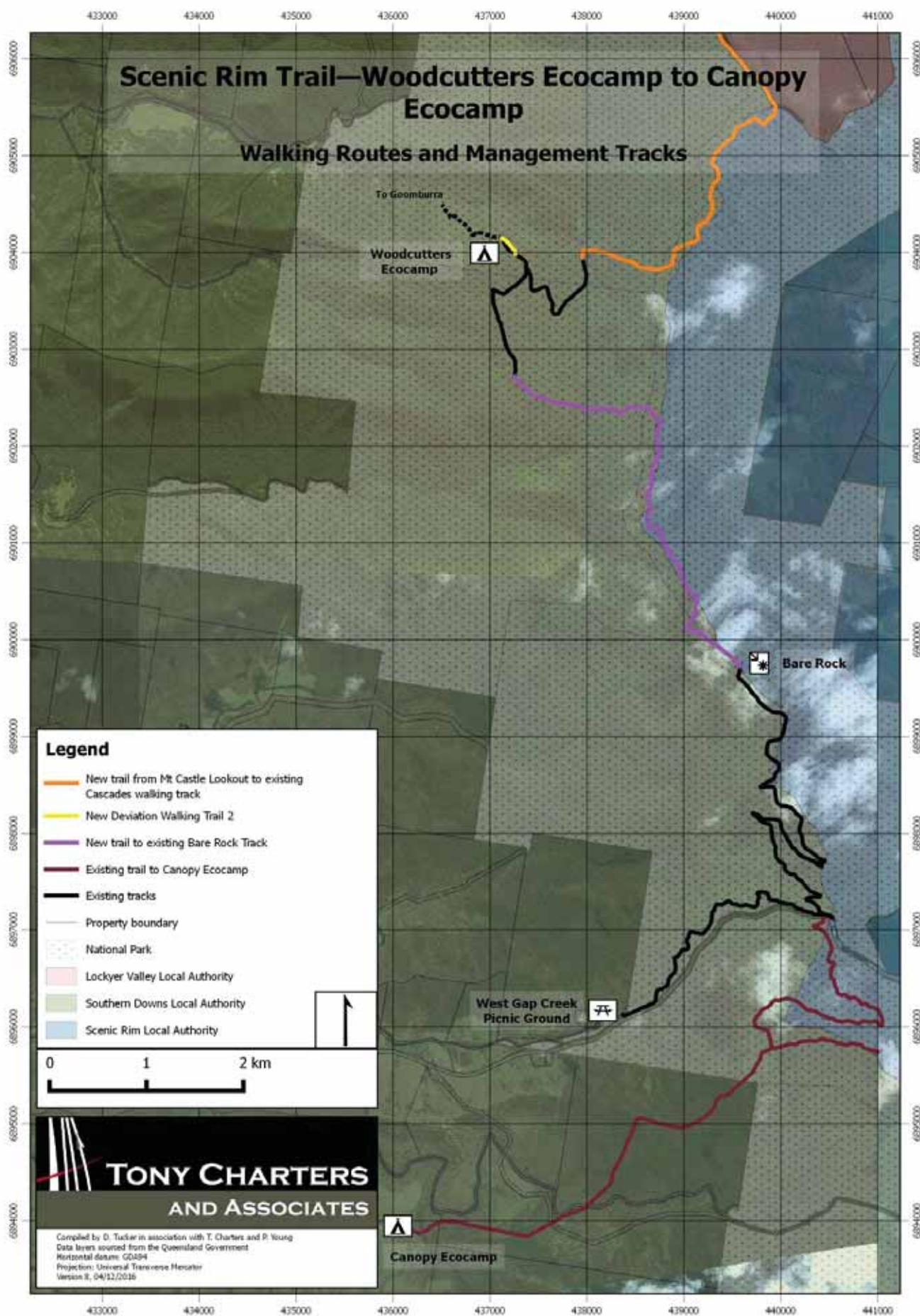


Figure 2.5 Woodcutters Ecocamp to Canopy Ecocamp showing walking trail.

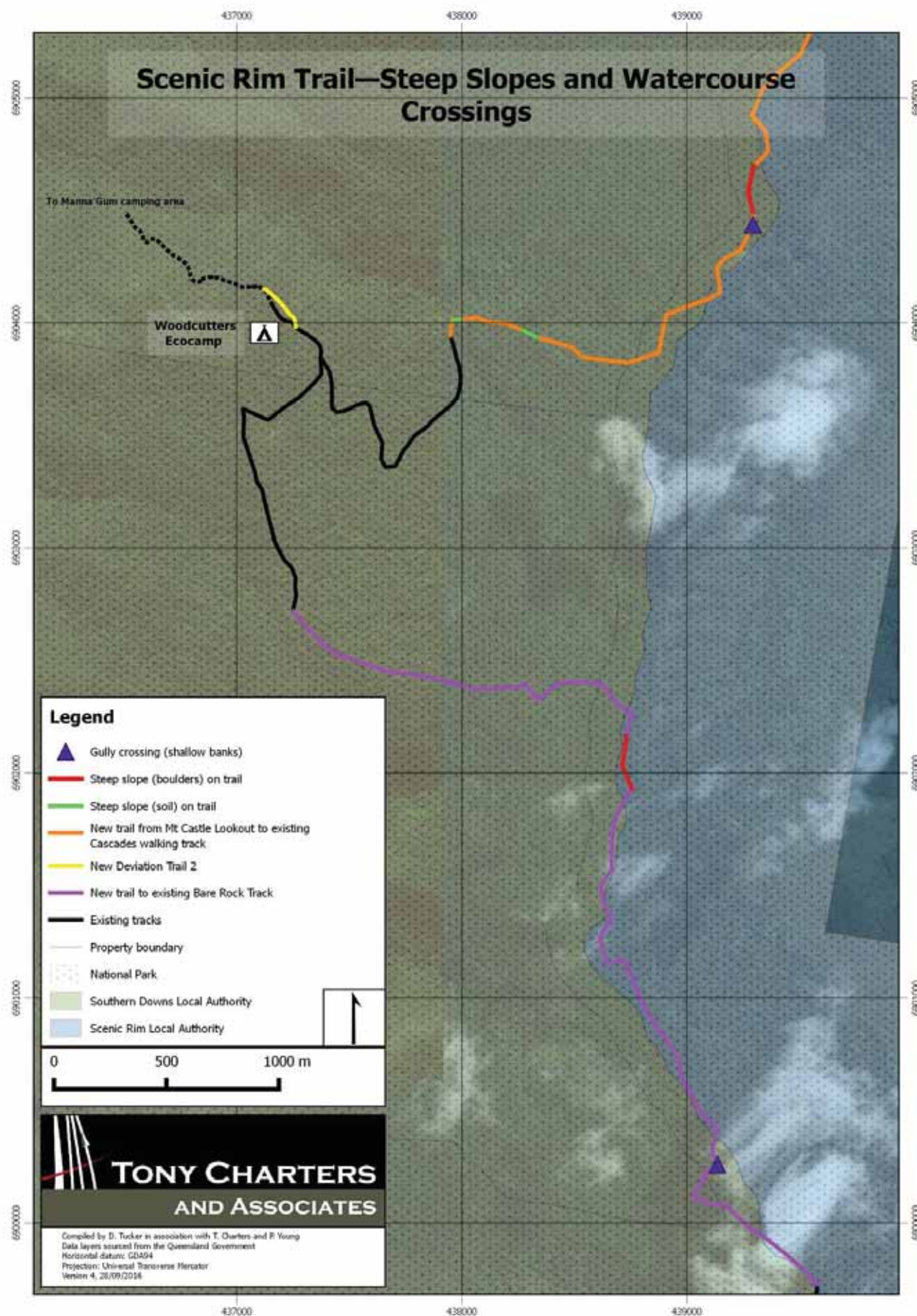


Figure 2.6 Steep slopes (boulders) south of Woodcutters Ecocamp

2.4. OVERNIGHT NODES

The Ecocamps and Ecolodges are located strategically to allow walkers to reach an overnight camp after approximately 5-7 hours walking time per day. Each Ecocamp would each have a distinct design and ambience developed from the natural elements of their environs – earth, rocks, timber, vegetation, aspect and viewsapes. They would be constructed of lightweight materials and apply green building principles. These sites would be for the exclusive use of Gainsdale Pty Ltd guests. They would be obscured from the walking trail so as to provide privacy and security.

Three levels of accommodation are planned by Gainsdale Pty Ltd:

Ecolodge – luxury small scale lodges for 24 guests. These structures will be located off-park on private lands owned by Gainsdale Pty Ltd. One Ecolodge already exists - Spicers Peak Lodge. No additional Ecolodges are planned to be constructed along this Scenic Rim Trail alignment. Ecolodges will be designed individually to optimise the values of the surrounding natural and cultural landscape. Ecolodges are located where road access is available and the level of infrastructure provides a luxury lodge experience. Ecolodges are staffed and guests would experience understated luxury accommodation, dining experiences featuring local fresh produce and wines and the interface of natural and rural landscapes. This will enable Gainsdale Pty Ltd to cater for guests who are not undertaking the Trail.

Ecocamps – comfortable but basic developed camp facilities, which are designed in configurations for up to 20 guests and 4 staff. Located on National Park and private lands and individually designed to reflect the surrounding natural and cultural landscape. A small common building will provide for dining, food preparation, bathrooms and protection in bad weather. Small basic huts will be provided for walkers. The scale of each Ecocamp will be determined based on its location and accessibility. The existing Spicers Canopy on Gainsdale Pty Ltd private land is at the most developed end the Ecocamp spectrum envisaged and accommodates up to 24 guests in 12 tent suites. The Woodcutters Ecocamp on National Park is planned for 10 guests and two ecoguides. Ecocamps within National Park will be designed to avoid trees to the greatest extent possible and individual camping pods will be placed in a free form way to avoid trees, rocks or other important landscape features. They would be constructed of lightweight materials and apply green building principles. These sites would be for the exclusive use of Gainsdale Pty Ltd guests. They would be obscured from the walking trail so as to provide privacy and security.



Perspective stylised view of an Ecocamp

The Ecocamps will be established to achieve minimal reliance on reticulated services. Given the absence of nearby mains power the Ecocamps would be self-sufficient for power, using a combination of solar and gas with a small back-up generator for emergency power. Water would be sourced from roof capture solar panels will be mounted on the roofs of the huts and common building. Solid waste would be removed from the site following each walking party departure.

Two 4000 L plastic sealed septic tanks will be installed. One primary tank and one as an emergency overflow tank (in the event of a prolonged period of wet water which precludes tanker access). The primary tank would be pumped out once it approaches maximum capacity, ensuring that the overflow tank is only used in emergency situations. The tanks would collect both grey and black water as a blend. The tanks will be pumped out via a pipe that the tanker connects to (with an on-board vacuum pump). Toilets will be ultra-low flush units (2 litre flush). A grease trap would be installed on the kitchen waste for disposal off site.

Structures will be prefabricated, and assembled on site on screw piles that enable water flows to continue unaffected. Services will be attached to underfloor and underdeck areas wherever feasible.

The Mt Mistake Farmhouse is built on private land but requires the opening of the old Forestry Road from Mt Mistake/Thornton to Lookout Road, Goomburra (the road to Castle Mountain Lookout car park) in order to service the Farmhouse and for fire/flood management, emergency evacuation and trail building and maintenance purposes. The road access track would be limited to 2.5 m width and a 2.5 m height clearance. Some gravel (from approved disease-free quarries) will be required for low sections and steep sections. Drainage systems will need to be re-instated or upgraded to minimise erosion and siltation.

Woodcutters Ecocamp would be built in National Park adjoining the Cascades Trail, although outside of the World Heritage Area. This site is in a small clearing where a woodcutters camp was established to undertake logging of the native forests in the 1950s and 1960s. The Cascades Trail is an old logging and management road. The road (behind a locked gate) would provide management access to service the Ecocamp. Some gravel (from approved disease free quarries) and drainage works will be required on steep sections.

Wilderness Ecocamps – a basic remote camp facility for 10 guests and two ecoguides in strategically accessible areas along the Trail. Located on National Park in a location that:

- can be accessed within a day walk;
- avoids rainforest;
- can be serviced by management vehicles;
- is protected from fire prone areas;
- maintains high altitude for climatic and practical walking distance considerations; and
- is hidden from high use public areas.

The Wilderness Ecocamp will be equipped to provide guests with the ability to clean up after a long days walk and to have access to a toilet, shower, communal shelter from the elements in poor conditions and individual, very small hut structures for sleeping. The common hut will both capture solar energy for small scale lighting and power systems. Food and domestic waste would be removed from the site by Gainsdale Pty Ltd staff as part of the cleaning schedule immediately after each group departs.

The infrastructure includes a small common building, which will serve as a dining, cooking, relaxation area. The roof will enable capture of rainwater and provide protection from weather. The Wilderness Ecocamp will integrate toilet units and bush shower units off the interconnected, raised boardwalks. There will be seven camping pods located nearby and guests will sleep in two-person pods. The design of the structure will be lightweight and in colours and shapes that will minimise visibility.



Perspective stylised view of a Wilderness Ecocamp

Pods will eliminate the effects of erecting tents continually in the same location. The footprint of the pod will be similar to a 3-person tent and will be well insulated and ventilated for summer and winter conditions. Ecocamps within National Park will be designed to avoid trees to the greatest extent possible and individual camping pods will be placed in a free form way to avoid trees, rocks or other important landscape features.

Structures will be prefabricated, and assembled on site on screw piles that enable water flows to continue unaffected. Services will be attached to underfloor and underdeck areas wherever feasible.

The overarching design intent is to maintain a low key and low impact trail, track and ecocamp system. Ecocamps will be located at points that achieve a daily walking distance of 12-16 km (5-7 hours walk). Ecocamps will be located at points that achieve an average daily walking distance of 10.6km (5-7 hours walk).

Amphitheatre View Wilderness Ecocamp would be built in National Park adjoining the Mt Castle West Fire Line which traverses due west from the Castle Mountain Lookout car park (near the entry to the Winder Trail). This road is behind a locked gate and is a well-formed road. The road would provide management access to service the Wilderness Ecocamp. Some resurfacing and drainage will be required for low sections prone to bogginess and steep sections.

2.5. ASSOCIATED INFRASTRUCTURE

2.5.1. Gateways

Use of the Scenic Rim Trail is one way from north to south. Guests will commence the Scenic Rim Trail from Thornton Nature Refuge, having been transferred by a Spicers courtesy vehicle from nearby Spicers Hiddenvale. A Scenic Rim trailhead will be established at the Thornton Nature Refuge. The Thornton Trailhead will have a car park, toilet and information signage. Guests will walk through to Spicers Peak Nature Refuge.

Members of the public undertaking the Scenic Rim Trail will complete their walk at the QPWS trailhead for the Mt Cordeaux and Bare Rock Tracks at Cunningham's Gap.

2.5.2. Toilet Facilities

Toilet facilities will be provided at the Thornton Trailhead and at each of the Ecocamps. Walkers along the trail will use bush toileting under QPWS standards i.e. 100m from the track and watercourses, with the shallow burial of faecal matter to the prescribed depth. Members of the public using QPWS Bushcamping sites will be advised to adopt bush toileting.

2.5.3. Lookout Decks

A lookout deck is proposed at a cleared site near the edge of the escarpment at the Mt Mistake Farmhouse. This site is on National Park. The deck will be raised off the ground.

A lookout deck is also proposed at the Amphitheatre View Wilderness Ecocamp. This will be located on the northern side of the management track, at the end of a short track - down from the ridgeline to where views of the Amphitheatre open up. This deck will be raised off the ground, using multiple levels, and will be minimalistic in design. The deck will be regarded as sacrificial in the event of wildfire.

2.6. EXTENT OF FOOTPRINT

The 5.7 km section of predominantly class 5 trail from Thornton Trailhead to Mt Mistake Farmhouse traverses freehold tenure. The disturbance footprint is largely confined to around 400 m of constructed track on the ascent of the escarpment which would result in 0.04 ha of ground disturbance within grassy Eucalyptus Woodland/Open Woodland. The higher standard sections of trail are required to minimise erosion and hiker injury risk. To all intents and purposes there is an existing class 5 trail along the scarp between the access point and Mt Mistake Farmhouse. It consists of pads formed by cattle (and possibly macropods) and provides a useable route requiring little or no further disturbance of vegetation apart from trimming of patches of low shrubby vegetation principally Lantana.

South from Mt Mistake Farmhouse the disturbance footprint is within the Main Range National Park. It comprises 13.6 km of new walking trail mostly class 5 standard, which will limit disturbance to creating a pathway through dense ground layer and regrowth vegetation. However, some localised ground disturbance is envisaged to form sections of class 3 and 4 trail to limit erosion risk, stabilise rock and minimise risk of hiker injury. Consequently, the trail will directly and indirect impact upon approximately 0.4 ha of ground layer vegetation mostly within Rainforest but including some Wet sclerophyll forest. The disturbance will result from: (1) construction of raised structures to avoid erosion of small sections of very steep slopes and creek banks; (2) stabilisation of loose boulders to form a narrow route on steep, rocky slopes; (3) gradual formation of a narrow footpad through repeated use by foot traffic in places where a pathway will need to be brushed/cut through very dense ground layer vegetation, especially fern, or through dense viney plant growth in formerly logged and wind affected rainforest.

The re-opened Winder Management Road will be 2.5 m wide resulting in an overall footprint of approximately 1.55 ha. It would require removal of 1.5 ha of rainforest regrowth colonising the former road surface (see Photo 1 for typical view of regrowth). The regrowth largely comprises ferns, vines, saplings and scatter small trees 4-8 m tall.

A further 150-200 m section (0.05 ha) of grasses and shrubs in the understorey of *Eucalyptus* forest would be removed for re-opening the road.

The route from Cunningham's Gap to Canopy Ecocamp uses a National Park walking track and existing trail which equates to Class 4 and 5 standards. Consequently there is a negligible requirement for any disturbance to vegetation and soil.



Photo 1. Typical view of regrowth vegetation on the disused Winder Management Road.

The Amphitheatre View Wilderness Ecocamp node will require removal of shrubs and ground cover from an area of 0.05 ha of *Eucalyptus* Open Forest. This will result in the removal of around 40-50 small trees <6 m high and 160-200 shrubs, based upon stem counts within the vegetation survey plot along with ground layer plants. No plant species of special conservation significance were recorded from the site.

The Woodcutters Ecocamp node will occupy a similar-sized area to Amphitheatre View Wilderness Ecocamp. However, the area has been subject to historical logging, clearing and ground disturbance. The main impact will be removal of patchy regeneration of small trees (10-15 individuals) and shrubs (80-100 individuals) along with ferns, vines and forbs to accommodate the structures. No plant species of special conservation were recorded from the site.

2.6.1. Node Location Descriptions

2.6.1.1. Amphitheatre View Wilderness Ecocamp

The proposed Amphitheatre View site is located within a patch of *Eucalyptus* Open Forest (regional ecosystem 12.8.14, least concern status) on a narrow ridge (Great Dividing Range) aligned roughly WSW-ENE. The site footprint is expected to be around 0.05 ha. The soil is a moderately deep red-brown clay loam. The altitude is 950 m. It is accessed by the Mt Castle West Fire Line, a track suitable for 4wd vehicles accessed through a locked gate, and Lookout Road. The site is bounded by the road on the northern side and topography falls sharply to the south-west where the vegetation changes due to steep conditions. It includes patches of *Lophostemon confertus* Brush Box and Rainforest in sheltered gully-heads. The road and moist vegetation types on the southern side of the ridge provide a degree of protection from wildfire.

The vegetation at the site was intensively surveyed to assess the potential impacts of ground and shrub layer disturbance required to locate the Ecocamp. No listed species or species of special conservation interest were recorded from the site.

There is no foreseen requirement to disturb or remove canopy vegetation apart from trimming or pruning dangerous limbs. However, if removal of any individual trees is found to be necessary during construction, replanting of 10 individuals of the same species (of local provenance) will be undertaken on site.

The site is weed-free apart from a minor presence of Lantana (*Lantana camara*) and Indian Weed (*Sigesbeckia orientalis*). The latter is an example of a weed belonging to the daisy family which often colonise sites in Open Forest after disturbance such as scraping of soil and fire. They tend to be ephemeral and do not usually require any control measures as they are outcompeted by native species and die out (although seed remains in the soil).

The management of the facility, including weed and feral animal management, will be the responsibility of Gainsdale Pty Ltd with QPWS oversight.

2.6.1.2. Woodcutters Ecocamp

The Woodcutters Ecocamp site is located high on the western fall of Main Range adjacent to the QPWS Cascades Trail, approaching the intersection with the Ridge Trail (Figure 2.6). While it lies within Main Range National Park it is outside the Gondwana Rainforests of Australia World Heritage Area (Figure 3.1). The site is expected to have a footprint similar in size to the Amphitheatre View Wilderness Ecocamp (0.05 ha). The vegetation at the site was intensively surveyed to assess the potential impacts of ground and shrub layer disturbance required to locate the structures. It comprises a regenerating patch of Tall open forest with New England Blackbutt *Eucalyptus andrewsii* and Sydney Blue Gum *E. saligna*. Its elevated location places it close to the boundary between Eucalyptus Open forest and Cool Subtropical Rainforest and clumps of coloniser rainforest trees and vines are scattered through the understorey. The proposed site would be located within a small flat pad (around 0.15 ha) which was constructed on a break of slope on the steep hillside to accommodate a galvanised iron hut associated with historical logging activities. The aspect is north-facing and despite the relatively dense tree overstorey sunlight penetrates the ground surface. The vegetation growing on the flattened pad has been modified by the history of disturbance (Photo 2) although it remains comparatively free of weeds with the exception of Lantana. It consists of Bracken *Pteridium esculentum* and Rasp Fern *Doodia aspera*, vines, small herbaceous plants, leaf litter and bare ground.



Photo 2. The flat pad occupied by the galvanised iron hut showing the modified ground layer vegetation in the foreground. Clumps of coloniser rainforest trees and vines are visible around the hut.

The slope behind the hut rises sharply and here, the understory of the New England Blackbutt Open forest changes abruptly from a wet sclerophyll type to a more open structure and there is a dense ground stratum with large clumps of Mat-rush *Lomandra longifolia* and native grasses and forbs. The vegetation on much of the flattened pad remains open and limited disturbance will be required to accommodate the Ecocamp. Disturbance would be confined to brushing of the ground layer for the individual building pads. There is no foreseen requirement to disturb or remove canopy vegetation apart from trimming or pruning dangerous limbs. However, if removal of any individual trees is found to be necessary during construction, replanting of 10 individuals of the same species (of local provenance) will be undertaken on site.

The galvanised iron hut (woodcutters hut) is visible from the Cascades Trail. A short deviation to the existing trail is proposed to separate the Cascades Trail from the Ecocamp infrastructure (Fig. 2.6). The 230 m long deviation is located downslope of the existing track and passes through similar vegetation. The deviation would comprise Class 4 track necessitating removal of around 0.02 ha of ground layer vegetation to create a linear path. However, patches of dense Lantana are present along the route and the track would provide an opportunity for localised removal of the weed to be undertaken.

The woodcutters hut would be restored and used as an interpretive facility for guests.

Planting a screen of small locally-occurring rainforest trees (for example Guioa, Sweet Pittosporum) on the down-slope side of the site would also assist with decreasing the extent to which the camp is visible to park users.

Gainsdale will install an additional water tank at the Ecocamp with a large diameter outlet hose, accessible from the entry driveway to enable QPWS and other emergency service vehicles to replenish slip-on fire units.

The management of the facility, including weed and pest management, will be the responsibility of Gainsdale Pty Ltd with oversight from QPWS.

2.7. FIRE DESIGN CRITERIA

A fire management specialist is advising the project team and a detailed analysis to develop best practice strategies and actions is underway. The following sections outline the parameters that will form the fire design criteria for the development.

2.7.1. Thornton Trailhead

The location for the trailhead is in the lowland area within the Gainsdale Pty Ltd Thornton property, some 5.7 km from Mt Mistake Farmhouse. This is a grazing property with Eucalypt Woodland and Open Forest. It is on private freehold land. The trailhead will have entry signage including a fire rating board, maps, and key contact numbers. The Thornton Trailhead shall be accessed by a 4WD only access road. A fenced carpark facility will be provided at the trailhead. A toilet shall also be provided.

Clearing of trees/remnant vegetation is not required for fire protection around the rudimentary infrastructure as it is only the ground fuels that require maintenance to develop and maintain fuel reduced zones. There will be no disturbance of standing trees. Some overhead dead, dying and dangerous limbs will be removed to reduce the fire and safety hazard.

2.7.2. Mt Mistake Farmhouse

The location for the Mt Mistake Farmhouse is within largely cleared open eucalypt forest country. It is private freehold land. It has large clearings around the existing Farmhouse. The proposed small lookout deck on the eastern side of the Farmhouse is also on cleared land at the top of the escarpment. The removal of trees is not required as it is only the ground fuels that require maintenance to develop and maintain fuel reduced zones. The Kikuyu pasture surrounding the existing infrastructure is also less susceptible to carrying fire than native pasture grasses. No

disturbance of standing trees will be required. Some overhead dead, dying and dangerous limbs will be removed to reduce the fire and safety hazard.

Given the significant existing water storage at Mt Mistake, fire hydrants will be installed to provide protection to the building perimeter using diesel generated power to operate water pumps.

A separate storage structure is maintained for flammable liquids – principally diesel for the generator and the farm based flammable products.

The access track to the Mt Mistake Farmhouse will be upgraded with gravel at existing un-gravelled, steep areas, and have improved drainage installed, allowing for 4WD access in all but extreme wet conditions. Rural Fire Service appliances will be able to access the site during construction and operation of the site. Gainsdale Pty Ltd will have a slip-on fire unit located at Mt Mistake. Gainsdale Pty Ltd has earthmoving equipment at Mt Mistake that can be utilised in a fire emergency to clear breaks etc. as directed by QPWS on National Park areas.

2.7.3. Amphitheatre View Wilderness Ecocamp

The location for the Amphitheatre View Wilderness Ecocamp is within Eucalyptus Open Forest, merging to the east and south with Wet Sclerophyll Forest/Rainforest. It is located immediately to the south of the Mt Castle West Fire Line. Traditionally QPWS have undertaken control burns off this fire line, on the northern side of the road. Fire is unlikely to approach from the eastern or southern flanks due to the protection of the moist forest types. Fire from the north or west is possible with the vegetation type in these areas being predominately open grassy Eucalypt. This will present a higher bushfire risk in fire danger periods. The proposed small lookout deck on the northern side of the western fire line/management road is more exposed to wildfire coming up from the valley.

For fire management purposes the removal of trees is not required as it is only the ground fuels that require maintenance to develop and maintain fuel reduced zones.

Fuel reduced zones can simply be developed by managing existing ground vegetation and will not require the introduction of other forms of vegetation. Little disturbance will be required of standing trees. Some overhead dead, dying or dangerous limbs will be removed to reduce the fire and safety hazard.

The buildings and lookout deck will not be permanently occupied and will be “sacrificial” in the event of wildfire.

The access track to the Amphitheatre View Wilderness Ecocamp will be repaired along the moderately steep areas and hollows allowing for 4WD access in all but the most extreme wet conditions. Rural Fire Service appliances will be able to access the site during construction and operation of the Ecocamp. Gainsdale Pty Ltd will have slip-on fire units located at Mt Mistake and Spicers Peak Nature Refuge. Gainsdale Pty Ltd has earthmoving equipment that can be utilised in a fire emergency to clear breaks etc. as directed by QPWS.

2.7.4. Woodcutters Ecocamp

The location for the Woodcutters Ecocamp is within regenerating Wet Sclerophyll Forest. As such it has some buffering due to clumps of native rainforest colonisers and the presence of the road (Cascades Trail) downslope. The site was assessed as a low bushfire risk.

However, the southern side of the site backs on to more fire-prone New England Blackbutt Open Forest with a ground stratum of Matrush *Lomandra longifolia* and native grasses. The flattened pad around the old Woodcutters hut remains relatively open and occasional brushing could be used to maintain a narrow break to prevent ground fire entering the camp.

A regular maintenance program will see the removal of leaf litter from the roof and gutters and the installation of quality gutter guards to eliminate gutters filling with leaves.

The buildings will not be permanently occupied and will be “sacrificial” in the event of wildfire.

The access tracks and roads to the site will be upgraded and repaired allowing for 4WD access in all but the most extreme wet conditions. Rural Fires appliances will be able to access the site during construction and operation of the Ecocamp. Gainsdale Pty Ltd will have slip-on fire units located at Mt Mistake and Spicers Peak Nature Refuge. Gainsdale Pty Ltd has earthmoving equipment that can be utilised in a fire emergency to clear breaks etc. as directed by QPWS.

2.7.5. Canopy Ecocamp

The location for the existing Canopy Ecocamp is within cleared grazing country which was formerly open eucalypt forest. It is on private freehold land. The removal of trees is not required as it is only the ground fuels that require maintenance to develop and maintain fuel reduced zones. There will be no disturbance of standing trees. Some overhead dead, dying or dangerous limbs will be removed to reduce the fire and safety hazard. The buildings will not be permanently occupied and will be “sacrificial” in the event of wildfire.

Rural Fires appliances are able to access the site during construction and operation of the Ecocamp. Gainsdale Pty Ltd will have slip-on fire units located at Spicers Peak Nature Refuge. Gainsdale Pty Ltd has earthmoving equipment on site that can be utilised in a fire emergency to clear breaks etc. as directed by QPWS on National Park areas.

2.7.6. Walking Trail

Most of the proposed trail within National Park passes through Rainforest. The sections which traverse fire prone *Eucalyptus* Open Forest are largely confined to existing tracks in particular the Northern Fire Line. Rainforest vegetation has low flammability except in extremely dry conditions. The low fire risk associated with Rainforest vegetation is enhanced by the elevated topography and prevailing climatic conditions. Consequently the proposed walking trail will not introduce any increased fire risk or alteration to prevailing fire regime within the vegetation communities present.

The route between Thornton Trailhead and Mt Mistake Farmhouse is wholly within grassy *Eucalyptus* Woodland and Open Forest on freehold land. In this section of the trail, the narrow (0.6 m) pad would not be sufficient to act as a fire break and is not expected to interrupt current mosaic burning patterns.

3. THE EXISTING ENVIRONMENT

3.1. PLANNING

3.1.1. Local Government Authorities

The relevant local authorities are Lockyer Valley and Southern Downs Regional Councils. While the project team has consulted with local government authorities for the project, development planning and development applications for the components of the Scenic Rim Trail project outside of the National Park are not complete at this stage.

3.1.2. Land Use History

The steep scarps of the Main and Mistake Ranges north of Cunningham’s Gap have remained a significant barrier to human access. Since European settlement, access has been largely confined to two main routes, Dalrymple Creek/Goomburra Valley on the south-eastern Darling Downs and the Laidley Creek Valley on the north-eastern side. Spurs on private land have also been used to

provide access to timber and grazing on the periphery of the massif. The upper reaches of the Goomburra Valley were initially part of a cattle run operated by Ernest Dalrymple, a close friend of the Darling Downs pioneers the Leslie brothers.

The upper-most reaches of the catchment were excised as state forest in the 1920's. Logging of rainforest timber had commenced in the 1870's. After the change of tenure to state forest, harvesting of native softwood and hardwood species occurred and experimental plantings of native and introduced conifers were established. The Mistake Range provided prized cabinet timbers especially Red Cedar (*Toona ciliata*) and Rosewood (*Dysoxylum fraserianum*) as well as timbers used in flooring and other internal uses, railway carriage construction and plywood.

An area of state forest towards the northern end of the Mistake Range was converted to national park when public interest in a conservation estate along the Scenic Rim gathered momentum in the 1960's-1970's. Around this time, logging of rainforest species was winding down as most accessible timber had been removed. Some limited logging of *Eucalyptus* and Brush Box continued. The national park was extended in 2006 through the South East Queensland Forest Agreement when the remaining state forest (Goomburra section) was incorporated into an expanded Main Range National Park. This conversion saw an end to logging of state lands in the area.

The more open types of *Eucalyptus* country have been grazed by cattle utilising native grasses and herbs, and there has also been a focus upon honey production. The area also developed a reputation as an attractive and challenging destination for bushwalking and orienteering as part of the greater Scenic Rim.

3.1.3. Management of the Main Range National Park and other Reserves

The Master Plan for Queensland's Parks and Forests to 2025 (State of Queensland, 2014) sets out the five core QPWS Service Areas as:

1. Managing parks and forests for conservation and for people
2. Facilitating ecotourism, recreation and heritage experiences within the protected area estate
3. Providing protected area services with Traditional Owners and Indigenous Communities
4. Managing protected area permissions
5. Enhancing management capability.

One of the challenges emphasized in the Master Plan is that of balancing improved conservation with the growth of the tourism industry; and providing better access for all Queenslanders and visitors. There is a goal to work with partners to promote and sustainably manage nature-based tourism, and at the same time the QPWS has an opportunity to review and consolidate the protected area system to provide improved access while maintaining natural and cultural values.

The specific management of Main Range National Park is set out in the Main Range National Park and Spicers Gap Road Conservation Park Management Statement 2013 (State of Queensland, 2013), which stresses the conservation values of the National Park for flora and fauna habitat and wildlife movement, and as the northern-most extent of the World Heritage listed Gondwana Rainforests of Australia, which make up 77% of the total National Park area.

The National Park is one of the largest in Queensland and offers a range of visitor experiences from picnicking in day use areas to remote bushwalking and camping. There are limits on the size of camping parties determined by the environmental sensitivity and condition of the camp sites. Some fire management trails are regularly used for bushwalking. The National Park is also used by scientists and university students for research purposes.

The Management Statement identifies the management of pest plants and animals, and fire as key issues. There are programs in place to reduce the presence of Madeira Vine, Moth Vine,

Blackberry, Annual Ragweed and Crofton Weed, as well as targeting outbreaks of relatively new pest plant species such as Formosa Lily. Controlling exotic grasses is a priority as they facilitate fire, and exotic legumes are also targeted as they may smother native groundcover and shrubs and present a major threat to the integrity of the park.

Feral animals specifically mentioned in the Management Statement are Feral Pigs and Feral Dogs, although a need to monitor presence and abundance of feral animals to guide vertebrate pest control programs is stated. Cooperation with adjacent landholders and managers is considered important for successful management of feral animals.

A Level 2 pest management strategy has been developed for the park and is being progressively implemented. The Operational Policy – Pest Plant and Pathogen Spread Prevention, is also being implemented to reduce the risk of introducing and spreading pest plants.

Fire is used as a tool for maintaining the health of Open Forest and Heath communities, and to assist in the control of some weed species. This planned burning also reduces the opportunity for fire sensitive ecosystems to be subject to high intensity wildfires. The Master Plan indicates that a review of the fire management strategy for the National Park is required to incorporate new burning guidelines for regional ecosystems.

The management directions for the Main Range National Park and Spicers Gap Road Conservation Park as set out in the 2013 Management Statement are set out in the following table:

Desired Outcomes	Actions and guidelines
<p>Tourism and visitor opportunities Opportunities for outdoor recreation are provided in a largely remote and natural setting.</p>	<p>A1. Update the park's interpretive signs, visitor guides and webpage to enhance visitor orientation, safety messages and provide information on park values. A2. Develop a visitor management strategy for the protected areas of the western Scenic Rim.</p>
<p>Fire management Fire is managed to protect life and property and conserve biodiversity values.</p>	<p>A3. Review and implement the fire management strategy. A4. Maintain fire access tracks trails, both on the park and on neighbouring properties to provide for safe access during planned burning and wildfire response.</p>
<p>Partnerships Cooperation with neighbours contributes to improved management outcomes.</p>	<p>A5. Continue to maintain communication and supportive relationships with park neighbours to enhance cooperative management, particularly in relation to:</p> <ul style="list-style-type: none"> • fire and pest management • fire trail maintenance • fencing and access agreements • visitor orientation and safety.
<p>Pest Management The impact of pest plants and animals on conservation values is minimised.</p>	<p>A6. Implement the Level 2 pest management strategy. A7. Use passive methods such as the Allen activity index and trap cameras to assess pest animal abundance and distribution.</p>
<p>Regional Ecosystems Biodiversity values are protected and restored where necessary.</p>	<p>A8. Periodically assess the condition of key ecosystems, particularly those that are of concern or endangered, to determine management needs and evaluate the effectiveness of fire and pest management practices. A9. Monitor populations and habitats of key species (both threatened and common) as indicators of ecosystem health. A10. Promote the use of fire to address bell miner die-back and other ecosystem health issues.</p>

Desired Outcomes	Actions and guidelines
<p>Native Plants and Animals Biodiversity values are better understood and applied to management practices.</p>	<p>A11. Implement actions from recovery plans for species of conservation significance, where feasible.</p> <p>A12. Monitor populations of key species (both threatened and common) as indicators of ecosystem health.</p> <p>A13. Apply local knowledge of native plant and animal populations to the adaptive management of fire and pest management practices.</p>
<p>Landscape Landscape integrity is enhanced.</p>	<p>A14. Investigate opportunities for strategic land acquisition, to expand the area of the park and link-up disjunct sections.</p> <p>A15. Develop a Memorandum of Understanding with the Department of Transport and Main Roads to formalise the management of the Cunningham Highway corridor through the park, to provide for the redevelopment of the car park and closure of the truck stop at Cunningham’s Gap and to set out responsibilities for pest plant and rubbish management.</p>

The Scenic Rim Trail by Gainsdale Pty Ltd includes a strong partnership focus and interest in providing a safe, integrated ecotourism product with consistent policies and procedures for visitors. Pest control and rehabilitation of degraded areas are also shared goals as they contribute to a high quality ecotourism product. As part of its ongoing commitment to conservation, Gainsdale Pty Ltd would participate in planned rehabilitation projects with QPWS and Landcare groups as it has in the past with Landcare groups and volunteer groups on Spicer Peak Nature Reserve in relation to riparian zone management and rehabilitation. Under its commitment to maintain the Trail, Gainsdale Pty Ltd would conduct agreed rehabilitation work at sites that have invasive weed species or other forms of degradation. The ecoguides will also maintain a GPS tagged log of each walk and record data on key issues that will assist in trail monitoring and recording of wildlife. This data will be freely shared with QPWS and research organisations endorsed by QPWS.

The Master Plan states that the Strategic Overview for Management of the Gondwana Rainforests of Australia World Heritage Area (Commonwealth of Australia, 2000) applies to management of Main Range National Park (see Section 3.1.4.4).

3.1.4. Management of the Gondwana Rainforests of Australia World Heritage Area

3.1.4.1. Listing Criteria

The Main Range section of the Gondwana Rainforests of Australia World Heritage Area was inscribed on the World Heritage List in 1994 and its boundary is shown in Figure 3.1. A small section of National Park around and including the Woodcutters Ecocamp site lies outside of the WHA boundary. The WHA meets three of the four criteria for World Heritage listing:

1. an outstanding example representing the major stages of the Earth's evolutionary history
2. an outstanding example representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment; and
3. an area containing the most important and significant habitats where threatened species of plants and animals of outstanding universal value from the point of view of science and conservation still survive.

Appendix 3 provides key examples of the World Heritage Values.

The Strategic Overview for Management of the World Heritage Area (Commonwealth of Australia, 2000) identifies the World Heritage Area (WHA) as an important recreational resource, attracting a growing number of local and overseas visitors and contributing significantly to the economies of local communities. It also recognises that the level of visitation places extra responsibilities on

managers to provide additional recreational opportunities without compromising ecological sustainability or the values that lie behind the listing.

Main Range National Park is the second largest reserve within the WHA. The Strategic Overview states that extensive natural areas have the capacity to represent a greater diversity of habitats in better health than smaller modified ones, and that wilderness often represents the only opportunity to maintain the integrity, gradients and mosaics of ecological processes that constitute native biodiversity at the genetic, species, community and landscape levels.

3.1.4.2. Management Responsibilities

While the Commonwealth Government is obliged to ensure the identification, protection, conservation, rehabilitation and presentation of the property, day-to-day management of the Queensland sites within the WHA remains primarily the responsibility of Queensland Parks and Wildlife Service (QPWS) and the Department of Natural Resources and Mines. World Heritage listing has not affected ownership or control of the reserves included in the Gondwana Rainforests of Australia World Heritage Area.

As the Strategic Overview for Management covers all properties in the listing, from Main Range National Park in the north to Barrington Tops National Park in the south (broadly, between Brisbane and Newcastle) it does not provide detailed management prescriptions, rather it ensures that appropriate consideration is given to the World Heritage Area by managers when developing management prescriptions.

3.1.4.3. Identified Threats

The Strategic Overview identifies substantial strategic threats to the ongoing viability of the World Heritage values as:

- Uncontrolled or inappropriate use of fire;
- Inappropriate recreation and tourism activities, including the development of tourism infrastructure, under the increasing visitor pressure from Australia, overseas and commercial ventures;
- Invasion by pest species including weeds, feral animals and fungal pathogens; and
- Loss of biodiversity at all levels.

It is specified that wilderness areas provide protection against the scale of impacts from each of the identified threats and that any significant diminution of wilderness condition therefore could threaten the ecological integrity of World Heritage values. A referral of the proposal to the Commonwealth government for assessment under the EPBC Act will include assessment of the project on World Heritage values.

3.1.4.4. Management Principles and Strategies

The Strategic Overview sets out key management principles, specifying that management of the World Heritage area will aim to:

- Identify, protect, conserve, present and, where necessary, rehabilitate the World Heritage values of the property;
- Integrate the protection of the property into a comprehensive planning program;
- Give the property a function in the life of the Australian community;
- Strengthen appreciation and respects for the property's World Heritage values, particularly through educational and information programs, and keeping the community broadly informed about the condition of the World Heritage Values of the property;

- Take the appropriate scientific, technical, legal, administrative and financial measures necessary for implementing these principles;
- Provide for continuing community and technical input in managing the property; and
- Manage the broad range of values, both World Heritage and non-World Heritage, ensuring that achieving the long-term conservation of the reserves' World Heritage values is the over-riding principle.

Table 3.1 lists issues and management responses from the Strategic Overview that are most relevant to the Scenic Rim Trail proposal.

Table 3.1. Relevant WHA Management Issues, Management Responses and Relationship to the Scenic Rim Trail Project

Strategic Overview for Management (Commonwealth of Australia 2000)		Scenic Rim Trail Project
Relevant Issues	Relevant Management Responses	
Environmental impact assessment requirements vary between States and between local government areas, and between the different levels of government, including the Commonwealth.	Ensure that environmental impact assessments for proposals that may affect the property (whether or not on the reserves themselves) adequately address potential impacts on World Heritage values and are carried out in accordance with the Australian World Heritage management principles.	The project is being assessed by the Queensland Government and will also be referred to the Commonwealth for assessment under the EPBC Act. For associated developments outside of the World Heritage Area, the project will be assessed under Local and State government planning regulations.
Inappropriate and or intensive recreation activities may negatively impact on conservation.	Encourage appropriate visitor use through planning and provision of infrastructure. Manage and maintain existing visitor infrastructure to cater for planned levels of visitation and use, while ensuring impacts on the environment are minimised.	The project is for low-intensity recreation activities, with Class 5 walking tracks and low-impact overnight accommodation. The construction and operation of the project will be undertaken without affecting the integrity of the area and will ensure the maintenance and protection of conservation values.
Introduced species, especially weeds, have the potential to significantly impact on the World Heritage values of the property.	Develop an inventory of pest species infestations and degraded sites. Undertake and support research into rehabilitation methods and pest species effects and control. Ensure that pest control programs are adequately resourced for effective control to be achieved.	There will be strict controls applied to construction and operation of the project to prevent the introduction or spread of pest species. Gainsdale Pty Ltd will work with QPWS to ensure best practice in rehabilitation and pest control within and adjacent to the WHA, and will provide all monitoring and management information to QPWS.
There is potential for conflict with neighbours over the movement and spread of pest species.	Wherever possible, establish cooperative arrangements with neighbours and local government authorities in relation to pest management. Incorporate an introduced pest species management component into education and interpretation programs.	Gainsdale Pty Ltd will work with QPWS to ensure that pest management for the project is in keeping with QPWS requirements and contributes positively to management of the WHA. Gainsdale Pty Ltd will consult with QPWS to develop appropriate education and interpretation for guests with regards to pest species.
Increasing visitor numbers have the potential to adversely affect World Heritage values.	Ensure that the prime consideration in the face of increasing pressures for recreation is the conservation of an area's values. Ensure visitor facilities and recreational activities are planned	It is intended that the construction and operation of the project will have a minimal footprint and the number of guests utilising the facilities will be tightly controlled. Gainsdale Pty Ltd will work with QPWS to assist where necessary to regulate and guide general public access, and will be

Strategic Overview for Management (Commonwealth of Australia 2000)		Scenic Rim Trail Project
Relevant Issues	Relevant Management Responses	
	<p>and managed to have minimal or no threat to the values of the area.</p> <p>Provide community education to highlight the vulnerability of World Heritage values and promote the need for environmentally responsible behaviour.</p>	<p>responsible for the on-going management and monitoring of the effects of all infrastructure associated with the project.</p> <p>The World Heritage values of the area will be the focus of the development, and education of all guests will be part of the experience. Gainsdale Pty Ltd will consult with QPWS in the development of the educational program.</p>
Signs vary within the property, often carrying inconsistent messages.	Develop and follow standards for the design and content of signs and interpretive displays to ensure consistency of signage and messages.	Gainsdale Pty Ltd will consult with QPWS in the development of signs and interpretive displays to ensure consistency of signage and messages with those of the National Park and WHA.
Lack of quality control over presentations given by commercial tour operators within the property.	<p>Formulate a code of conduct for tour operators.</p> <p>Facilitate and encourage tour operators to undertake training courses. Examine options for developing competency based training programs for tour operators and implementing accreditation arrangements based on these.</p> <p>Enhance formal and informal consultation mechanisms with the tourism industry.</p>	Gainsdale Pty Ltd will work with QPWS to ensure that the management and ecoguides of the Scenic Rim Trail receive appropriate training. Ecocamps will have Advanced Ecotourism Certification which ensures best practices over interpretive programs. Ecoguides will have formal recognition under Ecotourism Australia's Ecoguide program.

3.1.5. Gondwanan Rainforests of Australia National Heritage Area

The Central Eastern Rainforest Reserves (now Gondwana Rainforests of Australia) were included in the National Heritage List in 2007, with listing criterion matching those of the World Heritage Listing.

3.2. THE ENVIRONMENT

3.2.1. Climate

The elevation of the Main and Mistake Ranges results in an incursion of temperate climate into the warm subtropical inland of south-eastern Queensland (Bureau of Meteorology 2005). The daily temperatures (minimum/maximum) range from 5-15°C in winter and 16-26°C in summer (Xu and Hutchison undated). Consequently, daytime temperatures are 6-8°C cooler than surrounding landscapes of the south-eastern Darling Downs and Lockyer and Fassifern Valleys, and the temperature along the proposed trail is seldom likely to exceed 28-30°C. Annual rainfall of 950-1100 mm pa (Xu and Hutchison undated) is augmented by mist and drizzle at higher altitudes. Storms are common during summer and incidence (30-40 days with thunder and lightning per year) is higher than surrounding areas (20-30 days) (Bureau of Meteorology 2005).

3.2.2. Geology, Geomorphology, Topography and Soils

The steep eastern escarpment of the Main and Mistake Ranges, stretching from the Queensland - New South Wales border at Wilsons Peak to north of Cunningham's Gap - differentiates the Moreton and Darling Downs regions and forms part of southeast Queensland's Mountainous Scenic Rim. The Main and Mistake Ranges are remnants of the Main Range Volcano, a broad edifice originally elongated north-south (Willmott 2004). It was one of a series of hot-spot volcanoes and associated intrusive plugs which became active as parts of southern Queensland and far north-eastern New South Wales passed over a weakness in the earth's crust 22-25 million years ago. Consequently, the basalts of the area are part of a wider area of volcanic activity which extended northwards beyond the Bunya Mountains – Kingaroy. Other major volcanoes of similar age in the region include the Focal Peak Volcano near Mt Barney, and the well-known and much larger Tweed Volcano whose remains form Lamington Plateau and the Border Ranges (Stevens and Willmott 1996).

The Main Range Volcano comprised numerous near-horizontal lava flows, largely basalt but including trachyte which is more widespread south of Cunningham's Gap. Unlike Mt Warning (Tweed Volcano), there was no well-marked centre of eruption for the basalt lavas, and it is likely that in the southern part at least, they came from numerous basalt dykes (dyke swarms) which fed small vents (Stevens and Willmott 1996). The flows which presently have a total thickness of up to 900m have a banded appearance which is visible in the steep rock pavements around Cunningham's Gap. The volcano has been extensively eroded since it formed, and is thought to have originally extended 25 km eastwards and 40 km northwards towards Ipswich.

East-flowing streams have aggressively eroded the basalt and underlying sedimentary rocks forming the steep escarpment. North of Cunningham's Gap the escarpment turns westwards forming an eroded amphitheatre around the headwaters of Lockyer Creek (Willmott 2004). However, the Mistake and Little Liverpool Ranges continue the northward trend of the Main Range although they gradually reduce in altitude. The elevated country of the Mistake Range forms a relatively broad though heavily dissected and eroded plateau-like structure 900-1070 m high. The flat-topped ridges on the western side of the range are thought to approximate the original surface of the volcano. They are separated by steep-sided valleys formed by streams including Blackfellow and Dalrymple Creeks. The topography rises to over 1150 m along the narrow escarpment between the Mistake Range and Cunningham's Gap.

A review of the soils within the Project area is provided as Appendix 4. The soils within the project area are predominantly ferrosols (krasnozems) and dermosols (prairie soils and minor areas of black earths) developed on basalt (Noble 1996). The red-coloured ferrosols occupy higher ridges and crests and are considered to be relictual soils formed by intense weathering of the former Tertiary land surface. The dermosols are more recent soils forming on fresh basalt exposed by erosion, especially on hillslopes. A lag of basalt boulders covers the ground surface on some of the higher ridges.

On the inland side of the scarp, erosive forces are visible where the heads of streams downcut the basalt to form rugged local topography. Examples occur on the Cascades Trail where stream channels are lined by sheer basalt clifflines.

3.2.1. Flora

3.2.1.1. Regional Ecosystems and Vegetation Communities

Thirteen regional ecosystems mapped by the Queensland Herbarium (12.8.1, 12.8.4-5, 12.8.7-9, 12.8.14, 12.8.16-17, 12.8.19) are indicated as being present along, or in the vicinity of the route from Thornton Trailhead to Canopy Ecocamp. These are shown on Figure 3.1 and described in Table 3.2. The regional ecosystem numbering system incorporates the biogeographic region in which they occur. The trail route falls within the South-east Queensland biogeographic region (biogeographic region 12) apart from the vicinity of Canopy Ecocamp which lies just west of the boundary between the South-east Queensland and Brigalow Belt regions (biogeographic region

11). The RE mapping indicates that two Brigalow Belt regional ecosystems (11.3.23, 11.8.9) are present along a section of trail east of Canopy Ecocamp although the vegetation was found to be a closer fit to their South-east Queensland counterparts (12.3.9, 12.8.16). The regional ecosystem mapping contains mosaics of different regional ecosystems (e.g. two or more regional ecosystems are present within a patch but couldn't be mapped separately at the mapping scale). Consequently one regional ecosystem indicated as being present within vegetation patches (polygons) does not specifically occur along the route (12.8.17).

Much of the proposed trail route passes through two types of rainforest known as Cool Subtropical Rainforest and Warm-Temperate Rainforest (Harden *et al.* 2014 <http://rainforests.net.au/product/rainforest-plants-of-australia/>). The latter is confined to highest crests and adjacent cool, sheltered slopes. It also traverses patches of *Eucalyptus* Open Forest and Tall Open Forest and passes close to vegetated rock pavement along the edge of the scarp. The species recorded from the different types of vegetation along the route are listed in Appendix 5.

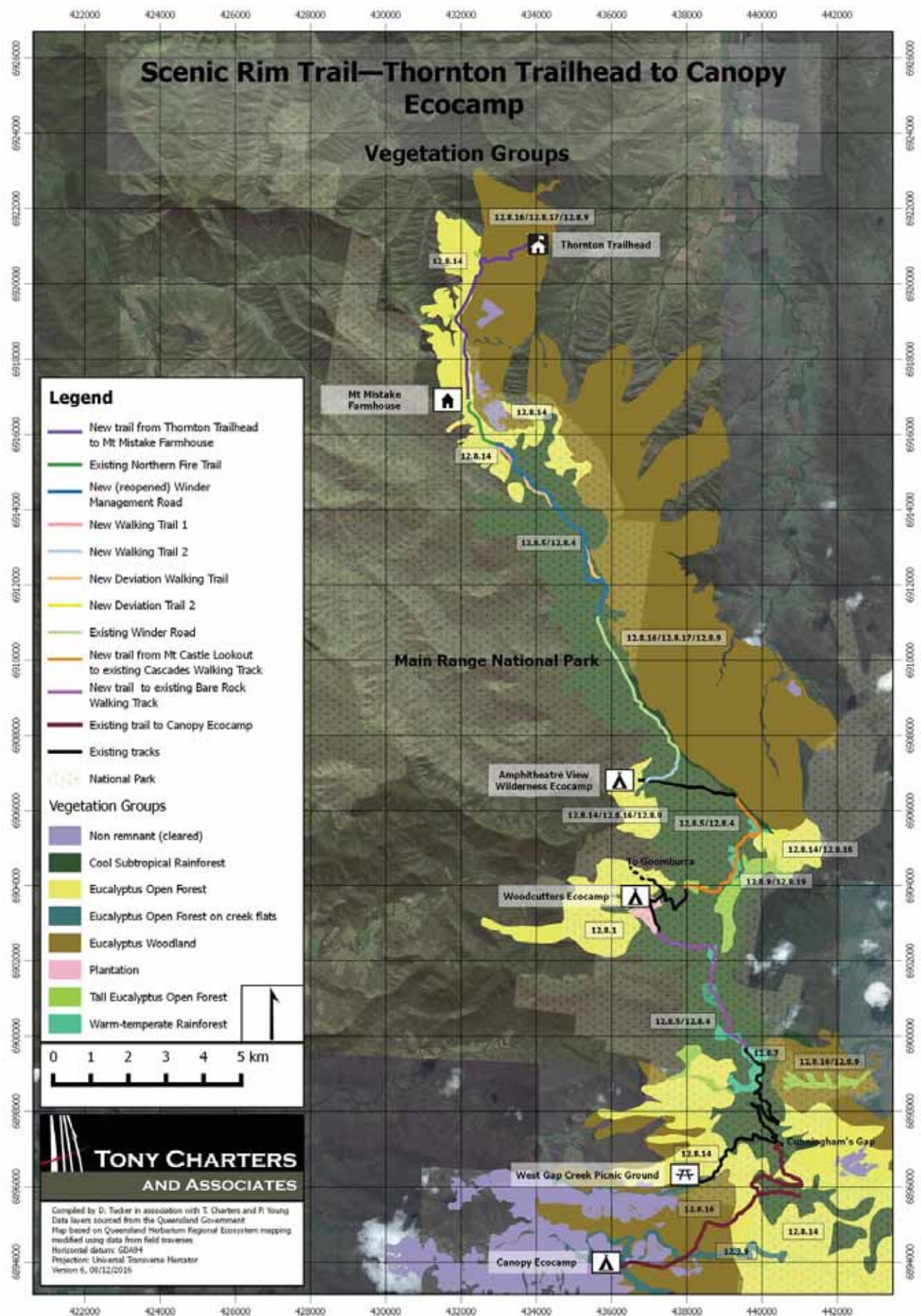


Figure 3.1 Vegetation Map

Table 3.2 Vegetation communities and regional ecosystems mapped in vicinity of walking trails between Thornton Trailhead and Canopy Ecocamp.

Vegetation Group	Mapped Regional Ecosystem	VMA status	Extent of mapped REs along new walking trails from Thornton Trailhead to Canopy Ecocamp
Cool Subtropical Rainforest	12.8.4 and 12.8.5. 12.8.4 is distinguished by presence of Hoop Pine	Least Concern	Widespread south from Mt Mistake. The two types appear to have been intermixed with 12.8.5 the more common type along the route.
Warm-Temperate Rainforest	12.8.7	Of Concern	Restricted to highest summits and ridgetops south from vicinity of Sylvester's Lookout.
Tall Open Forest (Wet Sclerophyll Forest)	12.8.1 New England Blackbutt	Least Concern	Restricted to the vicinity of Woodcutters Ecocamp.
	12.8.8 Sydney Blue Gum	Of Concern	12.8.8 and 12.8.9 tend to be interspersed forming patches amongst, or on fringes of Rainforest. They are relatively uncommon along the new trail route.
	12.8.9 Brush Box	Least Concern	
<i>Eucalyptus</i> Open Forest	12.8.14 Grey Gum, Thin-leaved Stringybark, Black Box, Yellow Box, Forest Red Gum	Least Concern	The main occurrences are along the crest of the Mistake Range between Thornton Trailhead and the vicinity of Mt Mistake Farmhouse, around Amphitheatre View Ecocamp and between Canopy Ecocamp and Mt Mitchell West Peak.
	12.3.9 Ribbon Gum/11.3.23 Ribbon Gum, Fuzzy Box, Forest Red Gum	Of Concern	12.3.9 (11.3.23) grows along creek flats in the headwaters of streams on the western side of Main Range. The only occurrence traversed by the trail is east of Canopy Ecocamp.
<i>Eucalyptus</i> Woodland	11.8.9 Narrow-leaved Ironbark, Forest Red Gum, White Box	Least Concern	Mapped around Canopy Ecocamp but trail does not traverse any remnant patches.
	12.8.16 Narrow-leaved Ironbark	Of Concern	Confined to drier hillsides and ridges.
	12.8.17 Silver-leaved Ironbark	Least Concern	Mapped along escarpment in far north of area although the trail does not traverse any patches.
Rock Pavement and/or heathland	12.8.19	Of Concern	12.8.19 is associated with cliff-lines and rock pavements and is visible from the trail where it is close the scarp edge. Heathland is rare, the major occurrence is the small patch traversed at Bare Rock.

Three regional ecosystems (12.8.7, 12.8.8, 12.8.9) have an Of Concern VMA status due to their restricted geographical extent in south-eastern Queensland while RE 12.8.16 has an Of Concern status because of depletion by clearing. No vegetation communities equating to Threatened Ecological Communities listed under the EPBC Act occur along the trail route.

Cool Subtropical Rainforest

Cool Subtropical Rainforest (CSRF) grows on moist sites with fertile soils at altitudes of 600 m – 1200 m in parts of southern Queensland and north-eastern New South Wales (Photo 3). It typically has a tall, uneven, dense canopy that ranges from 25-45 m in height. There is a broad mix of trunk sizes and large trees with a diameter at breast height (DBH) >1.5m are common. Large vines or lianes, strangler figs, palms, plank buttresses and epiphytes are characteristic features. The ground layer consists of ferns, herbs and strap-leaved herbs. In places, the understorey of mature rainforest is relatively open and there is a greater depth of field when it is viewed – visually-appealing patches where the understorey is open and ferny are traversed along the route.

Larger-growing tree species prominent in the rainforest along the route include Watkin's Fig *Ficus watkinsiana* a very tall strangler fig that grows above the tree canopy, Red Cedar *Toona ciliata*, Black Booyong *Argyrodendron actinophyllum*, Rose Mahogany *Dysoxylum fraserianum*, Pigeonberry Ash *Cryptocarya erythroxylon*, Pepperberry *Cryptocarya obovata*, Mountain Walnut *Cryptocarya foveolata*, Yellow Carabeen *Sloanea woollsii*, Churnwood *Citronella moorei*, Purple Cherry *Syzygium crebrinerve*, Myrtle Ebony *Diospyros pentamera*, Grey walnut *Beilschmiedia elliptica*, Bolly Gum *Litsea reticulata* and Mowbullian Whitewood or White Quandong *Elaeocarpus kirtonii*. Hoop Pine *Araucaria cunninghamii* is present in places.

Commonly-occurring medium to smaller-sized trees include Piccabeen Palm *Archontophoenix cunninghamiana*, Prickly Ash *Orites excelsus*, Brown Beech *Pennantia cunninghamii*, Grey Bolly Gum *Neolitsea australiensis*, White Malletwood *Rhodamnia whiteana*, Scrub Bloodwood *Baloghia inophylla*, Guilfoylia *Guilfoylia monostylis*, Red Apple *Acmena ingens*, Socketwood *Daphandra apetala*, Red-barked Sassafras *Cinnamomum virens*, Featherwood *Polyosma cunninghamii*, Muskwood *Alangium villosum* subsp. *polyosmoides*, Thorny Yellow-wood *Zanthoxylum brachyacanthum*, Whalebone Tree *Streblus brunonianus*, White Doughwood *Melicope micrococca*, Actephila *Actephila lindleyi* and Narrow-leaved Tuckerroo *Cupaniopsis baileyana*. Scrub pepperbush *Tasmannia insipida*, Walking Stick Palm *Linospadix monostachya*, Tree ferns including Soft Tree Fern *Dicksonia Antarctica*, Prickly Tree Fern *Cyathea leichhardtiana* and Rough Tree Fern *Cyathea australis*, Orange Thorn *Pittosporum multiflorum* and Palm Lily *Cordyline petiolaris* often form part of the lower tree/ shrub layer.

Many different vines are present ranging from slender types clinging to tree trunks, for example Pothos *Pothos longipes* to species that sprawl up to canopy height, remaining rooted to the ground by thick hanging stems. Conspicuous vines include Morinda *Morinda jasminoides*, Furry Silkpod *Parsonsia fulva*, Long-leaved Water Vine *Cissus sterculiifolia*, Five-leaved water Vine *Cissus hypoglauca*, Staff Vine *Celastrus subspicata*, Native Derris *Derris involuta*, Climbing Panax *Cephalalaria cephalobotrys*, Zigzag Vine *Melodorum leichhardtii*, Headache Vine *Clematis glycinoides* and Wonga Vine *Pandorea pandorana*.

Semi-epiphytic climbing ferns including cling to the lower parts of tree trunks. Common species include Fragrant Fern *Microsorium scandens*, Strap Fern *Dictymania brownii* and Climbing Fishbone Fern *Arthropteris tenella*. Other common epiphytic species include Birds Nest fern (*Asplenium australasicum*), King Orchid (*Dendrobium speciosum*), Dagger Orchid *Dockrillia pugioniformis*, Small-leaved Peperomia *Peperomia tetraphylla* and Robber Fern *Pyrrosia confluens*. Ferns are frequently the major species in the ground stratum, often covering much of the soil surface. Major species include Shield Ferns especially Trim Shield Fern *Lastreopsis decomposita* and Giant Maidenhair *Adiantum formosum*. Other ground stratum species include Christmas Orchid (*Calanthe triplicata*), Blueberry Flax Lily (*Dianella caerulea*) and Matrush *Lomandra* spp. The tall grass Stout Bamboo *Austrostipa ramosissima* is present in places. It is one of the few grasses present in the rainforest.



Photo 3. Unlogged patch of Cool Subtropical Rainforest with buttressed trees in a sheltered saddle along the scarp. The understory is open. Cool Subtropical Rainforest is the predominant type of vegetation along much of the trail route.

Rainforest subject to former logging or disturbance by tree fall has an altered structure (Photo 4). Tree fall creates sunny gaps which are colonised by pioneer or secondary growth species ranging from herbs, vines and shrubs to long-lived trees. Examples include Stinging Nettle *Urtica incisa*, Rose-leaved Raspberry *Rubus rosifolius*, Kangaroo Apple *Solanum aviculare*, Blackwood *Acacia melanoxylon*, Corkwood *Ackama paniculosa*, Native Mulberry *Hedycarya angustifolia*, Native Tamarind *Diploglottis australis*, Wild Quince *Guioa semiglauca* and Giant Stinging Tree *Dendrocnide excelsa*. The pioneer species together with regeneration of species found in undisturbed rainforest gradually close the gap which was created. The repairing rainforest along the route tends to have dense growth of vines and shrubs near ground level which impede progress on foot.



Photo 4. Logged Cool Subtropical Rainforest with a dense understory of shrubs, vines and ferns.

The Cool Subtropical Rainforest on the Mistake Range is mapped largely as Regional Ecosystem 12.8.4 (Figure 3.1) described as Complex notophyll vine forest with *Araucaria* spp. on Cainozoic igneous rocks. It has a VMA status of Least Concern. However, most of the Cool Subtropical Rainforest traversed is a better fit to RE 12.8.5 which occurs above 600 m altitude.

Warm-Temperate Rainforest

The proposed route traverses patches of Warm-temperate rainforest (WTRF) on the highest ridges and sheltered slopes (Photo 5).

Warm-Temperate Rainforest has a more uniform appearance than Cool Subtropical Rainforest and large buttressed trees are uncommon. It is also not as tall (15-28 m). Trees, shrubs and rocks are festooned with epiphytic ferns, mosses and lichens due to the influence of mist and drizzle. Occurrences are traversed along the scarp from near Mt Castle Lookout to Bare Rock. Lilly Pilly *Acmena smithii* is usually a dominant species in these patches. It grows as a tree 10-28m tall, often multi-stemmed. Other species commonly present include Mountain Walnut *Cryptocarya foveolata*, Smooth Prickly Ash *Orites excelsa*, Narrow-leaved Tuckeroo *Cupaniopsis baileyana*, Guioa *Guioa semiglaucula*, White Aspen *Acronychia oblongifolia*, Featherwood *Polyosma cunninghamii*, Socketwood *Daphnandra apetala*, Rough Possumwood *Quintinia sieberi*, Denhamia *Denhamia celastroides*, Red-barked Sassafras *Cinnamomum oliveri*, Black Plum *Diospyros australis*, Lomatia *Lomatia arborescens*, and the shrubs Scrub Pepperbush *Tasmannia insipida*, Orange Thorn *Pittosporum multiflorum* and Walking Stick Palm *Linospadix monostachya*. Tree ferns, vines and epiphytic ferns listed for Cool Subtropical Rainforest are also present. There is a dense ground layer of Shield Fern and Mat Rush.



Photo 5. Warm-temperate Rainforest occurs on highest summits and ridges. The photo shows a rough existing track winding through boulders north of Sylvester's lookout.

The vegetation is classed as Regional Ecosystem 12.8.7 Simple microphyll fern thicket with *Acmena smithii* on Cainozoic igneous rocks which has a VMA class Of Concern due to its limited extent. The transition from Warm-temperate rainforest to Cool Subtropical Rainforest is often gradual (e.g. on sheltered hillslopes) and there are patches where the rainforest in intermediate between the two types.

Eucalyptus Tall Open Forest (Wet sclerophyll forest)

The route traverses small patches of *Eucalyptus* Tall Open Forest or Wet Sclerophyll Forest between the Cascades creek system and the scarp. These patches are wholly isolated by rainforest and do not appear to have been logged due to the steep terrain. They consist of large Sydney Blue Gum *Eucalyptus saligna* and Brush Box *Lophostemon confertus* with long straight boles (Photo 6). The trees are 35-45 m tall. There is a lower tree stratum of rainforest trees including Hoop Pine, or a relatively open understorey with dense fern (mostly Gristle fern).

The vegetation is classed as Regional Ecosystem 12.8.8 *Eucalyptus saligna* Tall Open Forest on Cainozoic igneous rocks. It has a VMA Class Of Concern as it has a limited extent in the South-eastern Queensland region.



Photo 6. One of two localised patches of Wet Sclerophyll Forest with Sydney Blue Gum (white trunks) traversed by the trail. This area had not been logged due to the rugged terrain.

The Woodcutters Ecocamp is located within a former clearing in a patch of New England Blackbutt *Eucalyptus campanulata* Tall Open Forest (Photo 7). This is the only occurrence of this vegetation type along the SRT. New England Blackbutt forms tall even-aged stands along parts of Main Range especially on trachyte and rhyolite. However, the New England Blackbutt forest around the Ecocamp site is growing on basalt rather than trachyte. Sydney Blue Gum grows with New England Blackbutt at moister sheltered sites. It is present in the vicinity of the Ecocamp site and coloniser rainforest trees and vines are also present. The understorey changes abruptly upslope to a sparse mid-stratum of Forest Oak *Allocasuarina torulosa* and a dense ground stratum of Matrush *Lomandra longifolia*, Tussock *Poa labillardierei* and Bracken *Pteridium esculentum*.

New England Blackbutt growing on Tertiary volcanic forms RE 12.8.1 has a Least Concern VMA status.



Photo 7. New England Blackbutt Tall open forest immediately upslope of the Woodcutters Ecocamp site.

Eucalyptus Open Forest

A *Eucalyptus* Open Forest of mixed composition grows on relatively moist elevated basalt ridges and associated sheltered slopes along parts of the route. The canopy species include Thin-leaved Stringybark *E. eugenioides*, Black Box *Eucalyptus quadrangulata*, Grey Gum *E. biturbinata*, Yellow Box *E. melliodora* and New England Blackbutt *E. andrewsii* on some higher ridges. The understorey is open and grassy except in the interface or ecotone between *Eucalyptus* Open Forest and rainforest where it becomes invaded by vines and shrubs (Photo 8). The shrubs and small trees include Green Wattle *Acacia irrorata*, Maiden's Wattle *Acacia maidenii*, Blackwood *Acacia melanoxylon*, Forest Oak *Allocasuarina torulosa*, Brush Box *Lophostemon confertus* and Grass Tree *Xanthorrhoea glauca*.



Photo 8. *Eucalyptus* Open forest is traversed between Thornton Trailhead and the vicinity of Mt Mistake Farmhouse and near Amphitheatre View Wilderness Ecocamp.

The more common grasses include Kangaroo Grass *Themeda triandra*, Blady Grass *Imperata cylindrica*, Tussock *Poa labillardierei*, Wild Sorghum *Sorghum leiocladum*, Wallaby Grass (*Rytidosperma* spp.) and Nodding Hedgehog Grass (*Echinopogon nutans*). On steep exposed slopes the forest becomes lower and more open and Forest Red Gum *E. tereticornis*, Forest Oak *Allocasuarina torulosa* and Rough-barked Apple or Broad-leaved Apple *Angophora floribunda*, *A. subvelutina* are often prominent.

Most of the Eucalyptus Open Forest along the route is mapped as, and is a precise fit with, Regional Ecosystem 12.8.14 *Eucalyptus eugenioides*, *E. biturbinata*, *E. melliodora* +/- *E. tereticornis*, *Corymbia intermedia* forest on Cainozoic igneous rocks. It has a VMA and Biodiversity status of Least Concern.

Eucalyptus Open Forest on creek flats

Ribbon Gum *Eucalyptus nobilis* forms a relatively tall even-aged Open Forest on narrow creek flats in the western foothills of Main Range. The understorey is sparse and there is a dense ground stratum of grass species described for RE 12.8.14. The trail traverses an occurrence of RE 12.3.9 Ribbon Gum Open Forest en route to Canopy Ecocamp. Regional ecosystem 12.3.9 has an Of Concern VMA and Biodiversity status.

The Steep Slopes and Cliffs of the Escarpment

The trail network passes close to the eastern escarpment in places (Photo 9). It is steep to sheer and exposed rock (rock pavement) is common. Steep slopes with shallow loamy soil support grassy stunted Woodland (Photo 8) while patches of shrubs and clumps of Spear Lily *Doryanthes palmeri* grow in fissures and hollows on rock pavement (Photo 9).

Regional Ecosystem 12.8.19 encompasses the shrubby, rock pavement vegetation. The RE has a VMA Class and Biodiversity Status Of Concern due to its highly restricted extent. In the north of the proposal area grassy Open Woodland/Woodland (a form of RE 12.8.14) occurs in the vicinity of cliff lines (Photo 10). Forest Red Gum is often locally dominant in these situations.



Photo 9. View of the eastern escarpment north from Bare Rock showing Montane heathland shrubs and a Spear Lily growing on the exposed rock pavement in the foreground. The trail route is located close to the scarp edge visible in the picture.



Photo 10. Grassy Eucalyptus Open Woodland growing between a cliff line and the crest of the Mistake Range. The image shows an example of a cattle pad which runs along the top of the scarp in more open country north of Mt Mistake Farmhouse.

Bare Rock has a highly localised occurrence of Heathland with Wild May *Leptospermum polygalifolium*, Mint Bush *Prostanthera ovalifolia* and Port Jackson Pine *Callitris rhomboidea*. The rocks and stems of shrubs are covered in lichens, mosses and epiphytic/lithopytic ferns and Pink Rock Orchid *Dendrobium kingianum*. Small herbs, grasses and Mulga Fern *Cheilanthes sieberi* grow in the build-up of organic material under shrubs and in cracks and crevices in the exposed rocks. Bare Rock is the only Heathland patch traversed along the route.

Eucalyptus Woodland

Within the project area Woodland is limited to steep hill slopes (Photo 11). The main overstorey species are Narrow-leaved Ironbark *Eucalyptus crebra*, Forest Red Gum *E. tereticornis* and Yellow Box *E. melliodora*.



Photo 11. Grassy Woodland with Ironbarks locally prominent growing on the ridge used to access the crest of the Mistake Range from Thornton Trailhead. The tussock grass in the foreground is Wild Sorghum.

Other tree species present include Pink bloodwood *Corymbia intermedia*, Rough-barked Apple *Angophora floribunda*, Broad-leaved Apple *A. subvelutina*, Silver-leaved Ironbark *E. melanophloia* and Moreton Bay Ash *Corymbia tessellaris*. Forest Oak *Allocasuarina torulosa* forms a lower tree layer in places and shrubs are limited to Blue-leaved Grass Tree *Xanthorrhoea glauca* and Lightwood *Acacia implexa*. Grasses especially Wild Sorghum *Sorghum leiocladum*, along with Blady Grass *Imperata cylindrica*, Kangaroo Grass *Themeda triandra* and Black Spear Grass *Heteropogon contortus*, form a dense ground cover. The Woodland traversed is RE 12.8.16 which has VMA Class and Biodiversity Status Of Concern.

3.2.1.2. Threatened Flora (NC Act)

Bunya Mountains Bluegrass *Bothriochloa bunyensis* is a stoloniferous grass known to occur in grassy Open forest along the Mistake Range scarp in the extreme north of Main Range National Park. The Mistake Range is one of the few places where the grass has been found to occur away from the Bunya Mountains where it grows in *Eucalyptus* Woodland and the natural Grassland patches known as Balds.

There is a probability of occurrence of seven other NCA listed species based upon their habitat preferences and/or geographical ranges. They include Austral Toadflax *Thesium australe*, Brush Sophora *Sophora fraseri*, Cliff Orchid *Sarcochilus hartmannii*, the mistletoe *Muellerina myrtifolia*, Northern Clematis *Clematis fawcettii*, Slender Marsdenia *Marsdenia coronata* and Slender Milkvine *Marsdenia longiloba*. The life form and habitat of these species based upon information accompanying herbarium records from southern Queensland include:

- Austral Toadflax is a small uncommon sub-shrub which is partially parasitic on roots of native grasses, for example Kangaroo Grass. Mistake Range lies within the ecological range of the species although there are no specimen-backed herbarium records from the area. If present it would be restricted to grassy *Eucalyptus* Open forest/Woodland.
- Brush Sophora is a sprawling shrub which often grows in or close to the *Eucalyptus* Open forest – rainforest ecotone or open areas within drier types of rainforest. Mistake Range lies within the geographical range of the species. However, Brush Sophora has rarely been recorded from altitudes > 550 – 600 m which reduces the likelihood of occurrence (most of the walking trail network is > 900 m).
- Cliff Orchid grows on rocks and rock faces at altitudes of 500-1000m, often in rainforest. Mistake Range – northern Main Range lies within the ecological range of the species.
- *Muellerina myrtifolia* is a partly parasitic mistletoe that grows on rainforest trees, and has been recorded along parts of Main Range adjacent to the project area.
- Northern Clematis is a distinctive slender vine/climber in rainforest and rainforest edges especially drier rainforest types including Semi-evergreen vine thicket. Mistake Range – northern Main Range lies within the geographical range of the species although the nearest records are all from Semi-evergreen vine thicket in areas receiving < 800 mm rainfall per annum. The species is also very distinctive and unlikely to be missed by experienced observers in places where it grows.
- Slender Marsdenia is a twiner recorded from the understorey of *Eucalyptus* Open forest and Woodland growing on rocky sites on siliceous substrates and occasionally in Dry rainforest. It has mostly been recorded from locations < 70 km inland. The typical habitat in which it grows is not present along the trail.
- Slender Milkvine is a twiner recorded from the understorey of Wet sclerophyll forest/Tall Open forest growing on relatively infertile soils derived from meta-sediments and acid volcanic rocks. It has been recorded from adjacent parts of Main Range on infertile soils derived from trachyte and rhyolite. This type of habitat is not traversed by the trail.

3.2.1.3. Flora MNES Values

No EPBC Act listed Threatened Ecological Communities are confirmed as being present within the proposal area. Surveys have established that an EPBC Act listed Vulnerable species *Bothriochloa bunyensis* (Bunya Mountains Bluegrass) is present. Table 3.3 shows the likelihood of occurrence of all EPBC Act listed species predicted to occur in the area.

Table 3.3. Likelihood of Occurrence of EPBC Act Listed Flora

EPBC Act Listed Plant Species	Status	Likelihood of Occurrence
Austral Cornflower, Native Thistle <i>Rhaphonticum australe</i>	Vulnerable	Unlikely
Austral Toadflax <i>Thesium australe</i>	Vulnerable	Possible
Brush Sophora <i>Sophora fraseri</i>	Vulnerable	Unlikely
Bunya Mountains Bluegrass or Satin-top Grass <i>Bothriochloa bunyensis</i>	Vulnerable	Present
Cliff Orchid <i>Sarcochilus hartmanii</i>	Vulnerable	Possible
Hairy Jointgrass <i>Arthraxon hispidus</i>	Vulnerable	Unlikely
Macadamia Nut <i>Macadamia integrifolia</i>	Vulnerable	Unlikely
Miniature Moss Orchid, Hoop Pine Orchid <i>Bulbophyllum globuliforme</i>	Vulnerable	Unlikely
Mt Berryman Phebalium <i>Phebalium distans</i>	Vulnerable	Unlikely
Northern Clematis <i>Clematis fawcettii</i>	Vulnerable	Possible
Slender Marsdenia <i>Marsdenia longiloba</i>	Vulnerable	Unlikely
Wandering Pepper Cress <i>Lepidium peregrinum</i>	Endangered	Unlikely

The likelihood of occurrence of Austral Toadflax, Brush Sophora, Bunya Mountains Bluegrass, Cliff Orchid, Northern Clematis and Slender Marsdenia is discussed under 3.2.3.2 above. Comments in relation to additional species predicted to occur in the project area include:

- Austral Cornflower or Native Thistle grows on flat to undulating basalt country and alluvial plains in lower rainfall parts of south-eastern Queensland. The type of habitat preferred by the species is not represented along the trail route.
- Hairy Jointgrass is an uncommon grass. In south-eastern Queensland it has been recorded mainly from boggy ground with heavy soils. There is a very low probability of occurrence along the route based upon habitat preference.
- Macadamia Nut grows in lowland rainforest within 70 km of the coast and the proposal area is outside its ecological range.
- Miniature Moss Orchid is a minute, epiphytic orchid which grows on upper/outer branches of tall trees especially Hoop Pine. There are no specimen-backed herbarium records from Mistake – Main Range which lies to the north-east of its geographic distribution along the McPherson Range.
- Mt Berryman Phebalium grows in Semi-evergreen vine thicket, a type of Dry rainforest. This habitat type is not represented in the proposal area.
- Wandering Peppergrass is a herbaceous plant reportedly growing in riparian forest, Eucalyptus Open forest and Rainforest ecotones generally after disturbance. Mistake Range – northern Main Range lies within the geographical range of the species although there are no specimen-backed herbarium records from the vicinity.

A referral of the proposal to the Commonwealth government for assessment under the EPBC Act will include assessment of the project on EPBC Act listed flora species.

3.2.1.4. Other Flora Conservation Values

The Mistake and Main Ranges contain the northern geographical and ecological limits of range for a number of Border Range-restricted and other high altitude (temperate-adapted) species, for example Spear Lily *Doryanthes palmeri*, Mountain Boobialla *Myoporum betcheanum*, Black Box *Eucalyptus quadrangulata*, Ribbon Gum *Eucalyptus nobilis*, Mountain Walnut *Cryptocarya foveolata* and Prickly Ash *Orites excelsus*.

3.2.1.5. Weeds

Much of the trail route was noted to be largely weed-free, with presence of weeds confined largely to existing 4wd tracks in open sunny places and Rainforest-Open Forest ecotones and Eucalyptus Woodland and Open Forest subject to cattle grazing. A total of 45 weed species have been recorded from the entire Main Range National Park (DEHP WILDNET database). Additional species have been recorded during survey of the route (Appendix 5). The prominent weeds include daisies, grasses and members of the nightshade family (Solanaceae) along with the ubiquitous rainforest weed Lantana. Lantana remains absent on higher altitude parts of the Main – Mistake Ranges although it is an adaptable species known to spread attitudinally through time. Lantana is also an aggressive invader of Eucalyptus Woodland and Open Forest growing on basalt. It is a habitat modifier which shades out native grasses and forbs. Other invasive, persistent weeds recorded as being present include Crofton Weed *Ageratina adenophora* which grows in moist sunny places especially the *Eucalyptus* Open Forest – Rainforest ecotone and Giant Parramatta Grass *Sporobolus fertilis*, present along roadsides and Fireweed *Senecio madagascariensis* which invades grassy and disturbed Open Forest and Woodland as well as Rock Pavement.

Short-lived herbaceous weeds or ruderals, including Cobbler's Pegs *Bidens pilosa*, Fleabane *Conyza sumatrensis* and Billygoat Weed *Ageratum houstonianum* are present in open sunny places created by past clearing and these easily dispersed species are likely to be present in ashbeds (e.g. where a fallen tree has burned) after fire within the *Eucalyptus* Open Forest. Their abundance decreases with time if left undisturbed. Ruderal species persist in areas grazed by cattle along with longer-lived species for example Redhead Cottonbush *Asclepias curassavica*.

The rainforest along the Winder Management Road is also extensively weed-free apart from where there has been disturbance (e.g. tree fall) to form open sunny gaps. The *Eucalyptus* Open Forest traversed also had a low incidence of weeds away from road edges and ecotones. While weeds are more abundant along the existing 4wd access roads, the grassy and herbaceous vegetal cover along shaded parts of these tracks is provided by native coloniser type grasses and herbs which can be readily mistaken for naturalised weed species. The recorded weeds include temperate-adapted species that are uncommon in south-eastern Queensland.

Within Main Range National Park the rainforest is extensively weed-free apart from where there has been disturbance (e.g. tree fall) to form open sunny gaps. This is despite the long history of timber extraction. The surrounding *Eucalyptus* Open Forests also have a low incidence of weeds away from road edges and ecotones. While weeds are more abundant along the existing 4wd access roads, the grassy and herbaceous vegetal cover along shaded parts of these tracks is also provided by native coloniser type grasses and herbs which can be readily mistaken for naturalised weed species. The recorded weeds include temperate-adapted species that are uncommon in south-eastern Queensland.

3.2.1.6. Threatening Processes

The *Eucalyptus* Open Forest is subject to periodic unplanned fire including infrequent severe wildfire events. Unlike the *Eucalyptus* Forest and Woodland, fire does not burn any distance into rainforest unless conditions are extremely hot and dry. Events other than fire which have an impact upon native vegetation in the Mountain ranges of southern Queensland include wind, lightning, fungal diseases and predation by insects and other animals. A phenomenon known as Bell Miner Associated Dieback (BMAD) is presently affecting patches of *Eucalyptus* Open Forest along the Scenic Rim. Tree decline, dieback and death occur as a result of the complex interactions between

a psyllid (sap-sucking invertebrate), Bell Miners which feed on the sticky substance exuded by psyllid larvae, and the invasive species Lantana *Lantana camara* (Horton 2012). Bell Miner Associated Dieback is not currently present in the small patches of *Eucalyptus* forest along the trail.

The fungal pest Myrtle Rust *Puccinia psidii* has quickly spread since its arrival in eastern Australia and poses a major risk to many taxa within Myrtaceae (Pegg *et al.* 2013). Spores are spread by wind, insects, animals, transportation of infected plant material, equipment and clothing. The rust was not observed during surveys although susceptible species are present including Lilly Pilly *Acmena smithii*, Red Apple *A. ingens*, Native Guava *Rhodomyrtus psidioides* and Scrub Turpentine *Rhodamnia rubescens*. Dieback caused by the plant pathogen *Phytophthora cinnamomi* also presents a risk in the area due to the cool to warm moist conditions. There are no recent recorded occurrences in the survey area.

3.2.1.7. Plants – Safety Issues

Giant Stinging Tree is a rainforest pioneer species which is present along parts of the route where there has been historic logging disturbance or tree fall. Leaves and stems of Giant Stinging Tree carry silica-tipped hairs and human contact can cause extremely painful injury. Other rainforest plants are present which are armed with stinging hairs, spines or prickles. Prominent examples are Stinging Nettle *Urtica incisa* a weed-like native species that grows in moist well-lit disturbed places, the small rainforest understorey shrub Orange Thorn *Pittosporum multiflorum*, the vine Cockspur Thorn *Maclura cochinchinensis*, Rose-leaved Raspberry *Rubus rosifolius*, Molucca Raspberry *Rubus moluccanus*, and the small tree Thorny Yellowwood *Zanthoxylum brachyacanthum* which has conical-shaped protuberances on the trunk.

Giant Stinging Tree and other rainforest plants armed with spines and prickles pose a risk to users along track edges, and anywhere off track.

3.2.2. Terrestrial Vertebrate Fauna

3.2.2.1. Terrestrial Vertebrate Fauna of the Main Range National Park

The Queensland Government lists 403 species of terrestrial vertebrate as occurring, or having occurred, in Main Range National Park (DEHP 2016c). This total includes 70 mammal, 243 bird, 64 reptile and 26 frog species, 14 of which are introduced. Seventy-six of these species are known from a single record. For species such as small mammals and reptiles that require dedicated survey work this may mean they are under-reported. However, in many instances the single record reflects a species not typical of the habitats present in the park and hence not usually present or a species that was misidentified (not all records are vetted). The total does, therefore, substantially over-represent the park's fauna. This does not mean that the park's species assemblage is entirely understood. Because a species is not on the list does not necessarily mean it doesn't occur there, only that any record is not in the government database, or the species remains undetected. A search of the *Atlas of Living Australia* (ALA 2016), which included adjacent areas outside of the park identified, for example, four additional frog and two additional mammal species, most of which may occur in the park.

The importance of an area to fauna is not entirely indicated by the number of species it supports. The Main Range is the northernmost group of national and conservation parks of the Gondwana Rainforests of Australia World Heritage property. Its fauna includes the world's oldest forms of songbirds, including lyrebirds and scrub-birds. Albert's Lyrebird *Menura alberti*, a Near Threatened species in Queensland, is found only from Main Range south to north-eastern New South Wales. The Rufous Scrub-bird *Atrichornis rufescens* is considered Endangered nationally and reaches its northernmost distributional limit near Cunningham's Gap (Duffy Masters 2010). Hastings River Mouse *Pseudomys oralis*, listed nationally as Endangered, also has its northernmost limit in Main Range. Such protected areas are very important for this species, which seems intolerant of disturbance such as grazing and fire (Goldingay & O'Reilly 2010). There are historic records for Eastern Bristlebird in habitat south of Cunningham's Gap, although the species has not been recorded in this habitat for over 20 years since a fire event.

Three of the six reptile species endemic to Gondwana Rainforests occur in the Main Range (Reis 2010) and the Gondwana Rainforests are considered significant zoogeographical refugia for frogs. Only the Wet Tropics World Heritage Area in north Queensland supports a greater number of species (Mahony 2010). Main Range National Park supports more than half the frog species known for Gondwana Rainforests. Five of these frog species are listed as either Endangered or Vulnerable at state and/or national level. One of these, Mountain Frog *Philoria kundagungan*, is known only from the Main Range (Vanderduys 2012). The recorded occurrence of this and other conservation significant fauna species is discussed hereunder.

3.2.2.2. Conservation Significant Terrestrial Vertebrate Fauna

In this report, fauna of conservation significance include:

- species listed as Critically Endangered, Endangered or Vulnerable under the Commonwealth's *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act)
- species listed under Endangered, Vulnerable or Near Threatened under Queensland's *Nature Conservation Act* 1992 (NC Act)
- species listed as Migratory under the EPBC Act due to their inclusion under one of more of the following:
 - *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention),
 - *China-Australia Migratory Bird Agreement* (CAMBA)
 - *Japan-Australia Migratory Bird Agreement* (JAMBA)
 - *Republic of Korea-Australia Migratory Bird Agreement* (ROKAMBA).

A list of conservation significant species reported, or predicted, to occur in Main Range NP or the immediate landscape (Tables 3.4 & 3.5) was compiled by interrogating the *Atlas of Living Australia* (ALA 2016) and Queensland's *WildNet* database (DEHP 2016c), maintained by the Departments of Environment and Heritage Protection (DEHP) and Science, Information Technology and Innovation (DSITIA) and the EPBC Online Protected Matters Search Tool (PMST) maintained by the Department of Environment (DoE 2016c)¹. These records are supplemented by a field assessment for the project reported in Appendix 6. The nomenclature in use across the above sources is not consistent. This report follows the nomenclature provided by the *Australian Faunal Directory* (DoE 2016a), unless otherwise noted. Notable variations to this nomenclature, particularly in relation to species protected under the EPBC Act, are identified where appropriate.

The *WildNet* (WN) database contains records of species from a wide variety of sources and although most of the records are reasonably accurate spatially many of the records are unverified. WildNet includes some historical records, many of which have large margins of error in terms of actual location. WildNet data provided to the public does not include any date of record, details of the recorder, method of recording or location details. A search of a protected area does not allow for pre-1980 records to be excluded and hence historical records, which may no longer be relevant, are not identified. Many ALA records do include precise location details and date of record, though spatially imprecise records are also included. The ALA and WildNet records are not mutually exclusive.

¹ The ALA contains information aggregated from a wide range of data providers including museums, herbaria, community groups, government departments, universities and individuals. The *WildNet* database contains records of wildlife from Queensland Government departments and external organisations. The data sources include specimen collections, research and monitoring programs, inventory programs including extension activities, literature records, wildlife permit return and community wildlife recording programs. The PMST generates a report that helps determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in an area of interest. Any information provided through this facility is indicative only, relying on predictive modelling of suitable habitats. There may not be an actual record of a predicted species.

Table 3.4. Critically Endangered, Endangered, Vulnerable and Near Threatened terrestrial vertebrate fauna known or predicted to occur in Main Range National Park and its immediate environs.

Species	Status ¹		Comments ²
	EPBC Act	NC Act	
Mammals			
Spotted-tailed Quoll <i>Dasyurus maculatus maculatus</i> (SE mainland)	E	V	18 ALA records, the most recent is a Queensland Museum (QM) specimen from 1993. 19 WN records. Occurs in Rainforest and wet and dry Sclerophyll Forest (Van Dyck <i>et al.</i> 2013). The field survey confirmed that habitats throughout the project area are suitable for the species.
Koala <i>Phascolarctos cinereus</i>	V	V	9 ALA records. 37 WN records. Occurs in Eucalypt Forest and Woodland (Van Dyck <i>et al.</i> 2013). No signs of Koala (tree-trunk scratches, scats, grunting calls) were detected during the field survey despite targeted searching in suitable eucalypt habitats. Nevertheless, potentially suitable habitat for Koala includes all eucalypt forests in the project area.
Greater Glider <i>Petauroides volans</i>	V	LC	22 ALA records. 31 WN records. Occurs in Eucalypt Open Forest and Woodland (Van Dyck <i>et al.</i> 2013). The species was not detected during the field survey. Nevertheless, potentially suitable habitat for Greater Glider includes all eucalypt forests in the project area.
Long-nosed Potoroo <i>Potorous tridactylus tridactylus</i>	V	V	3 ALA records, the most recent is a DEHP 1998 record. 6 WN records. Occurs in wet Sclerophyll Forest with thick groundcover (Van Dyck <i>et al.</i> 2013).
Brush-tailed Rock-wallaby <i>Petrogale penicillata</i>	V	V	12 ALA records, all DEHP or QPWS and the most recent from 2006. 55 WN records. Occurs in rocky environments in Rainforest and Eucalypt Forest and Woodland (Van Dyck <i>et al.</i> 2013). The species was observed in the northern portion of the project area during the field survey, and suitable habitat occurs in the vicinity of steep, rocky escarpment slopes and cliffs throughout the project area.
Grey-headed Flying-fox <i>Pteropus poliocephalus</i>	V	LC	2 WN records and 2 ALA records. 1 ALA is a QPWS record from 2003. The other is a 2007 recording of a call. The co-ordinates place the latter record in Main Range NP but the location is given as Black Horse Creek Road via Kyogle (presumably incorrect). Occurs in a wide variety of habitats including Rainforest and Open Forest (Van Dyck <i>et al.</i> 2013). The project area is unlikely to be an important area for the species.
Corben's (Eastern) Long-eared Bat <i>Nyctophilus corbeni</i>	V	V	Predicted by the PMST. No ALA or WN records. Most common in Box/Ironbark/Cypress Pine Woodland on sandy soils, though it occurs in Bull Oak <i>Allocasuarina luehmannii</i> , Brigalow and Belah communities (Turbill <i>et al.</i> 2008), and Semi-evergreen Vine Thickets (Churchill 2008). Not expected to occur in or near the project area.
Large-eared Pied Bat <i>Chalinolobus dwyeri</i>	V	V	3 WN records. Occurs in a variety of habitats including Open Forest and Rainforest edges (Van Dyck <i>et al.</i> 2013).
New Holland Mouse <i>Pseudomys novaehollandiae</i>	V	LC	1 WN record and 2 ALA records (which probably include the WN record). All are 1997 records from Glenrock, a property to the west of Main Range NP. One of the records is within 3 km of the project area. Occurs in Open Forest and Woodland on sandy, loamy or rocky soils (Van Dyck <i>et al.</i> 2013). The species was not detected during the field survey.
Hastings River Mouse <i>Pseudomys oralis</i>	E	V	5 ALA records, the most recent is a DEHP 2007 record. 48 WN records. Occurs in Eucalypt Open Forest with dense groundcover of grasses, ferns or mat-rushes (Van Dyck <i>et al.</i> 2013). The field survey confirmed that potentially suitable habitat in the project area occurs in eucalypt forest within the northern section of Main Range National Park, between Manna Gum Campground and the proposed Woodcutters Ecocamp and the south western slopes of Mt Mitchell. One individual was trapped on the hillside 30 m upslope from the proposed Woodcutters Ecocamp site.
Birds			
Australasian Bittern <i>Botaurus poiciloptilus</i>	E	LC	1 BirdLife Australia record with no date and very imprecise co-ordinates, decimal degrees -28, 152.4. 1 WN record, possibly the same record. No detail is provided. DEHP (2016a) provides co-ordinates for all known Qld records and none is in the vicinity of the project area. No habitat for the species in the project area - not expected to occur.
Red Goshawk <i>Erythrotriorchis radiatus</i>	V	E	1 WN record and 2 ALA records. One ALA record is listed as DNPSR and is probably the WN record. Both ALA records have imprecise co-ordinates, -decimal degrees 27.9, 152.3, and are likely to be west of the project area. Occurs in woodlands and forests, particularly tall forests in areas of high rainfall (Woinarski 2007), and ideally with intact forest or woodland, a mosaic of vegetation types and permanent water, particularly riverine

Species	Status ¹		Comments ²
	EPBC Act	NC Act	
			forests, avoiding both very dense and very open habitats (Marchant & Higgins 1993; DERM 2009). In partly cleared habitats in eastern Australia it occurs in areas with gorges and escarpments (Czechura & Hobson 2000). Main Range NP is the centre of a recognised territory (DNPRSR 2013). However, the species was not detected during extensive surveys in 2013/14 focused on the vicinity of historical breeding records of the species, including Main Range National Park, and there have been no recent records of the species in the region (Seaton 2014). Consequently, the southerly range of Red Goshawk appears to have undergone a significant retraction over the past several decades and the species may no longer be breeding in the South-East Queensland region (Seaton 2014). The species was not detected during the field survey.
Black-breasted Button-quail <i>Turnix melanogaster</i>	V	V	2 DEHP records, both dated 1/1/93. 4 WN records. No detail is provided. Occurs in dry Rainforest and Vine-thickets with abundant leaf-litter. Also recorded in Eucalypt Forests with a dense understorey including <i>Lantana camara</i> (Marchant & Higgins 1993). There is no mention of a Main Range population in the national recovery plan (Mathieson & Smith 2009). The closest identified population is at Mt. French, c. 20 km to the east. The species was not detected during the field survey.
Australian Painted Snipe <i>Rostratula australis</i>	E	V	1 Historical Bird Atlas record with no date and very imprecise co-ordinates, decimal degrees -28, 152.4 (ALA 2016). Occurs in terrestrial shallow vegetated wetlands, usually freshwater but occasionally brackish, including temporarily inundated woodlands and grasslands, swamps, saltmarsh and artificial wetlands such as dams, rice crops, sewage farms and bore drains (Pringle 1987; Marchant & Higgins 1993; Garnett & Crowley 2000). Little to no suitable habitat for the species in the project area - not expected to occur.
Squatter Pigeon <i>Geophaps scripta scripta</i>	V	V	Predicted by the PMST. No ALA or WN record. Mostly occurs on sandy sites near permanent water (Blakers <i>et al.</i> 1984), in dry grassy Eucalypt Woodlands, Open Forests (Frith 1982; Crome & Shields 1992) and Cypress Pine <i>Callitris</i> spp. and acacia woodlands (Frith 1982). No suitable habitat - not expected to occur.
Glossy Black-cockatoo <i>Calyptorhynchus lathami lathami</i>	-	V	74 ALA records. 56 WN records. Occurs in woodlands dominated by casuarinas (<i>Allocasuarina</i> and <i>Casuarina</i> spp.) and in woodlands with an understorey of casuarina (Higgins 1999; Holmes 2012). The field survey recorded feeding evidence (distinctive cone chewings) under <i>Allocasuarina torulosa</i> trees in eucalypt forest at multiple locations on the Thornton to Mt Mistake section, between the Manna Gum campground and Woodcutters Ecocamp and the woodland habitats on the lower slopes of Mt Mitchell. Areas of eucalypt forest throughout the project area support potential feeding and/or nesting habitat.
Swift Parrot <i>Lathamus discolor</i>	CE	E	1 WN record. No detail is provided. Breeds in Tasmania, dispersing across south-eastern Australia during winter (NPWS 2003). Movements on the mainland are little understood and the species is considered nomadic and irruptive, moving in response to food resources (Higgins 1999). It is infrequently, though possibly annually, recorded in SE Qld. At best, a very rare and irregular visitor to the area.
(Coxen's) Double-eyed Fig-parrot <i>Cyclopsitta diophthalma coxeni</i>	E	E	8 DEHP records, the most recent is 1994. 10 WN records. Occurs in Rainforests, riparian corridors in Woodland and Open Woodland (Garnett & Crowley 2000). The species was reliably recorded from Main Range NP in 1997 (Coxen's Fig-Parrot Recovery Team 2001).
Powerful Owl <i>Ninox strenua</i>	-	V	3 ALA records. 5 WN records. Prefers mature dry forest with many live hollow-bearing trees and diverse habitats within two kms (Loyn <i>et al.</i> 2001). The species was not detected during the field survey.
Albert's Lyrebird <i>Menura alberti</i>	-	NT	109 ALA records. 125 WN records. Mostly occurs in Rainforest and wet sclerophyll forest with a mesic understorey (Higgins <i>et al.</i> 2001). The field survey confirmed this species inhabits rainforest habitats throughout the project area.
Rufous Scrub-bird <i>Atrichornis rufescens</i>	E	V	17 ALA records, most recent 2007. 19 WN records. Occurs in rainforest and adjacent Open Eucalypt Forest with a Rainforest understorey (Higgins <i>et al.</i> 2001). The species was not detected during the field survey.
Eastern Bristlebird <i>Dasyornis brachypterus</i>	E	E	122 ALA records. 86 WN records. Occurs in tall dense grassy groundcover in Open Eucalypt Forest and Woodland, often at ecotones with Rainforest (Higgins & Peter 2002). Northern regional population estimated to comprise < 50 birds following rapid decline toward the end of the 20th century. Population now appears to be in gradual decline in SE Qld (DoE 2016b).

Species	Status ¹		Comments ²
	EPBC Act	NC Act	
			The species was not detected during the field survey. The majority of habitats within the project area are generally unsuitable. The area with potential for the species is on the southern section of Mt Mitchell where there are historical records.
Southern Emu-wren <i>Stipiturus malachurus</i>	-	V	1 WN record. No detail is provided. Higgins <i>et al.</i> (2001) state that the species is restricted to coastal areas in Qld but it is known from southern parts of Girraween NP (Terry Reis personal observation). Occurs in wet and dry Heathland (Higgins <i>et al.</i> 2001). No suitable habitat - not expected to occur.
Regent Honeyeater <i>Anthochaera phrygia</i>	CE	E	Predicted by the PMST. No WN record. 1 ALA record which has imprecise co-ordinates, decimal degrees -27.9, 152.3, and is likely to be west of the project area. Occurs mainly in dry Box-Ironbark Eucalypt Woodland and dry sclerophyll Forest (Higgins <i>et al.</i> 2001), preferring the wettest, most fertile sites (Garnett & Crowley 2000). No suitable habitat for the species in the project area - not expected to occur.
Painted Honeyeater <i>Grantiella picta</i>	V	V	Predicted by the PMST. No ALA or WN record. Occurs mainly in dry open Woodlands and Forests with a strong association with mistletoe (Higgins <i>et al.</i> 2001). Woodlands dominated by acacias are particularly favoured, but the species also occurs in Belah <i>C. cristata</i> , Bullock <i>A. luehmannii</i> , White Cypress Pine <i>C. glaucophylla</i> and Riparian Woodland of <i>E. camaldulensis</i> (Barea & Watson 2007; Garnett <i>et al.</i> 2011; Watson 2012). No suitable habitat for the species in the project area - not expected to occur.
Black-throated Finch <i>Poephila cincta cincta</i>	E	E	Predicted by the PMST. No ALA or WN record. Occurs in dry Open Woodlands and Forests with seeding grasses and free-standing water (Higgins <i>et al.</i> 2006b). It is now possibly extinct in New South Wales and there were only six Atlas of Australian Bird records in southern Queensland for the period 1977 to 1981 and none for <i>Atlas of Australian Birds 2</i> (Higgins <i>et al.</i> 2006b). The southern subspecies is now considered to extend southwards only as far as the upper Burdekin River basin (Payne 2010). The species is not expected to occur.
Reptiles			
Collared Delma <i>Delma torquata</i>	V	V	Predicted by the PMST. No ALA or WN record. Has a highly fragmented distribution and occurs in Eucalypt Woodlands and Open Forests in Queensland Regional Ecosystem Land Zones 3 - Alluvium (river and creek flats), 9 - Undulating country on fine-grained sedimentary rocks & 10 - Sandstone ranges (Brigalow Belt Reptiles Workshop 2010). The species was not detected during the field survey.
Five-clawed (Long-legged) Worm-skink <i>Anomalopus mackayi</i>	V	E	Predicted by the PMST. No ALA or WN record. Occurs in open Grasslands on heavy cracking soil (Wilson 2015) in areas with closely spaced tussock grass that are prone to inundation (Ehmann 1992). Also occurs in Eucalypt Open Woodland, Cypress Pine <i>Callitris</i> spp. Woodland with a grassy groundcover and in Grassland on loam or sandy soils (Hobson 2012). In Queensland the Five-clawed Worm-Skink is now largely confined to relic roadside verges (Wilson 2015). No suitable habitat - not expected to occur.
Three-toed Snake-tooth Skink <i>Coeranoscincus reticulatus</i>	V	LC	7 ALA records, including two QM specimens, 12 WN records. Occurs in Rainforest (Wilson 2015). The species was not detected during the field survey, but potentially suitable habitat occurs in rainforest throughout the project area.
Condamine Earless Dragon <i>Tympanocryptis condaminensis</i>	E	E	Predicted by the PMST. No ALA or WN record. Occurs within remnant Grassland and mixed crops and nearby road verges (Wilson 2015). No suitable habitat for the species in the project area - not expected to occur.
Common Death Adder <i>Acanthophis antarcticus</i>	-	V	1 DEHP record, dated 1/1/93. There are two WN records. Occurs in a wide variety of habitats including Rainforest, wet and dry Sclerophyll Forest and Woodland (Ehmann 1992). The species was not detected during the field survey.
Dunmall's Snake <i>Furina dunmali</i>	V	V	Predicted by the PMST. No ALA or WN record. Poorly known, occurs in Open Forests and Woodlands, particularly Brigalow and Woodlands growing on cracking black clay and clay loams (Cogger <i>et al.</i> 1993). No suitable habitat for the species in the project area - not expected to occur.

Species	Status ¹		Comments ²
	EPBC Act	NC Act	
Frogs			
Tusked Frog <i>Adelotus brevis</i>	-	V	8 ALA records, including six QM specimens. The most recent record is 1972. There are two WN records. The species was still present on North Branch Road in 2000 (Harry Hines pers comm.). Occurs in Rainforest and wet and dry sclerophyll, often on rocky streams (Vanderduys 2012). The species was not detected during the field survey.
Fleay's Barred Frog <i>Mixophyes fleayi</i>	E	E	646 ALA records. 4001 WN records. Occurs on permanent and semi-permanent freshwater streams in Rainforest and other forest communities (Hines & SEQTFRT 2002). Main Range NP is a stronghold for the species (DNPRSR 2013), particularly the Goomburra area. During the targeted field survey, individual males were heard calling at intervals of 20-30 m along the perennial stream on the proposed new trail between the Winder track and the proposed Amphitheatre Ecocamp.
Giant Barred Frog <i>Mixophyes iteratus</i>	E	E	1 WN record. No detail is provided. Occurs in Rainforest and wet sclerophyll, especially along streams (Vanderduys 2012). Cunningham's Gap previously supported the species but targeted surveys and intensive monitoring in the late 1990s failed to locate the species (Hines <i>et al.</i> 1999). The species was not detected during the field survey.
(Red-and-yellow) Mountain Frog <i>Philoria (Kyarannus) kundagungan</i>	-	V	52 ALA records. 84 WN records, including 11 specimens. Occurs in rainforest, mostly restricted to small soaks (Vanderduys 2012). The species was detected at two locations during the field survey, along moist drainage lines in rainforest.
Pearson's Frog (Cascade Treefrog) <i>Litoria pearsoniana</i>	-	V	258 ALA records. 192 WN records. Occurs on Rainforest and wet sclerophyll streams, especially in palm forest (Vanderduys 2012). The species was not detected during the field survey.

1. Status: CE = Critically Endangered, E = Endangered, LC = Least Concern (Common), NT = Near Threatened, V = Vulnerable.
2. Comments about habitat either refer to habitats present within the project area or are intended to indicate that the species is unlikely to occur due to a lack of suitable habitat.

Table 3.5. Migratory¹ bird species known or predicted to occur in Main Range National Park and its immediate environs

Species	Comments
Eastern Osprey <i>Pandion cristatus</i>	There is a single Historical Bird Atlas record with no date and very imprecise coordinates, decimal degrees -28, 152.4 (ALA 2016). Occurs along the entire Australian coastline and extends far inland, typically along major rivers or on large lakes and reservoirs (Debus 1998). There is no suitable habitat for this species in the project area and it is not expected to occur.
Latham's Snipe <i>Gallinago hardwickii</i>	1 WN record. Occurs in a wide variety of permanent and ephemeral wetlands, preferring open freshwater wetlands with fringing vegetation. Also recorded from swamps, billabongs, lakes, edges of creeks and some artificial waterbodies. It will occur in any vegetation around wetlands, including Grasslands, Heath, Woodland and Forest (Higgins & Davies 1996). This species would, at best, be a rare and irregular visitor to the area.
Common Greenshank <i>Tringa nebularia</i>	1 WN record. Occurs on a wide variety of coastal habitats and inland wetlands. Uses permanent and ephemeral terrestrial wetlands including swamps and dams (Higgins & Davies 1996). Very rare and irregular visitor to the area.
Oriental Cuckoo <i>Cuculus optatus</i>	2 ALA records and 2 WN records, which may be the same records. Occurs in Rainforest, Vine Thicket and Open Forest and Woodland. The species is often recorded in gardens and plantations (Higgins 1999).
White-throated Needletail <i>Hirundapus caudacutus</i>	6 ALA records. 6 WN records. In Australia, almost completely an aerial species, possibly even sleeping on the wing. The species is sometimes found roosting in trees and may on rare occasions rest in trees and on the ground during the day. Found over a wide variety of habitat, including open areas, modified land and the ocean but most often recorded over wooded areas (Higgins 1999).
Fork-tailed Swift <i>Apus pacificus</i>	1 WN record. In Australia, almost exclusively an aerial species, probably even sleeping on the wing, though individuals are occasionally recorded roosting in trees. Foraging occurs over a wide variety of habitats including towns and cities, open areas, farmland, coastal areas and sometimes forest (Higgins 1999).

Species	Comments
Rufous Fantail <i>Rhipidura rufifrons</i>	153 ALA records. 123 WN records. Occurs in moist habitats, including Rainforest and along watercourses and gullies (Higgins <i>et al.</i> 2006a). The field survey confirmed the species is a common inhabitant of rainforest throughout the project area.
Spectacled Monarch <i>Symposiachrus trivirgatus</i>	17 ALA records. 22 WN records. Occurs in low dense vegetation, mainly in Rainforest, but also in wet sclerophyll forests and other dense vegetation (Higgins <i>et al.</i> 2006a). The species was not detected during the field survey.
Black-faced Monarch <i>Monarcha melanopsis</i>	133 ALA records. 117 WN records. Occurs in Rainforest, wet sclerophyll forest and deep gullies (Higgins <i>et al.</i> 2006a). The field survey confirmed the species is a common inhabitant of rainforest and adjacent wet sclerophyll forest throughout the project area.
Satin Flycatcher <i>Myiagra cyanoleuca</i>	4 ALA records. 2 WN records. Occurs in wet, dense forests, often at high elevations, and also in gullies and near watercourses (Higgins <i>et al.</i> 2006a). The species was not detected during the field survey.
Yellow Wagtail <i>Motacilla flava</i>	Predicted by the PMST. No ALA or WN database record. Species or species habitat may occur within area (DoE 2016e). Occurs in open areas with low vegetation, especially in cultivation and on lawns, sporting fields and air fields (Higgins <i>et al.</i> 2006b). Very rare in southern Queensland and not expected to occur.

1. Species listed as Migratory under the EPBC Act 1999 and Special Least Concern under the NC Act 1992.

A referral of the proposal to the Commonwealth government for assessment under the EPBC Act will include assessment of the project on EPBC Act listed fauna species.

3.2.2.3. Feral Species

There are database records for 15 feral species, comprised of one amphibian, five bird and nine mammal species. Feral deer are apparently also present (DNPRSR 2013), though the species is not documented. The PMST (DoE 2016c) predicts the occurrence of an additional six feral species (Table 3.6). Of the species for which there is no database record, Brown Rat *Rattus norvegicus* is considered very unlikely to occur given that it is rarely found away from human habitation, especially in coastal areas (Van Dyck *et al.* 2013), there is no suitable habitat for Mallard *Anas platyrhynchos*, Common Blackbird *Turdus merula* is very poorly established in Queensland and is largely associated with gardens, Nutmeg Mannikin *Lonchura punctulata* is a coastal species and European Goldfinch *Carduelis carduelis* has undergone substantial declines in Queensland in recent decades. The likelihood of occurrence of feral species in the proposed project area is provided in Table 3.6.

Table 3.6. Feral terrestrial vertebrate species known or predicted to occur in Main Range National Park and its immediate environs and likelihood of occurrence in the project area.

Species	Database record ¹	Likelihood of Occurrence
House Mouse <i>Mus musculus</i>	Yes	Likely
Brown Rat <i>Rattus norvegicus</i>	No	Not expected
Black Rat <i>Rattus rattus</i>	Yes	Likely
Wild Dog <i>Canis lupus familiaris</i>	Yes	Possible
Red Fox <i>Vulpes vulpes</i>	Yes	Expected
Cat <i>Felis catus</i>	Yes	Expected
European Rabbit <i>Oryctolagus cuniculus</i>	Yes	Not expected
European Brown Hare <i>Lepus europaeus</i>	Yes	Unlikely, across the forested portions. Known from the Mt Mistake Farmhouse.
Pig <i>Sus scrofa</i>	Yes	Known (in significant numbers)
Cattle <i>Bos taurus</i>	Yes	Unlikely
Deer sp.	No	Expected
Mallard <i>Anas platyrhynchos</i>	No	Not expected

Species	Database record ¹	Likelihood of Occurrence
Rock Dove <i>Columba livia</i>	Yes	Unlikely, across the forested portions. Known from the Spicers resort
Spotted Dove <i>Spilopelia chinensis</i>	Yes	Unlikely, other than around the Mt Mistake Farmhouse.
Common Myna <i>Sturnus tristis</i>	Yes	Unlikely
Common Starling <i>Sturnus vulgaris</i>	Yes	Unlikely
Common Blackbird <i>Turdus merula</i>	No	Not expected
House Sparrow <i>Passer domesticus</i>	Yes	Unlikely
Nutmeg Mannikin <i>Lonchura punctulata</i>	No	Not expected
European Goldfinch <i>Carduelis carduelis</i>	No	Not expected
Cane Toad <i>Rhinella marina</i>	Yes	Expected

1. Atlas of Living Australia and/or WildNet database record.

3.2.2.4. Threatening Processes

The conservation significant fauna species potentially present in the project area are subject to a variety of threatening processes, some of which are relevant, to varying degrees, to the project both initially and as on-going management issues. Both *Eucalyptus* Open Forest and Rainforest are subject to fire, though in the latter fire is typically only of consequence under extremely hot and dry conditions. Altering a fire regime will affect both the plant and animal species present, though winners and losers can be difficult to predict. For example, fires in dry conditions that degrade or even destroy suitable habitat threaten Rufous Scrub-bird. But cooler fires may also restore habitat suitability for the species as ground cover declines with habitat maturation, i.e. as the preferred dense groundcover is shaded out by canopy species (DoE 2016a). Conversely, Eastern Bristlebird, threatened by too frequent fires, suffers from vegetation becoming too dense without fire (Bain *et al.* 2008). Human activity potentially increases the likelihood of accidental fire and maintenance of tracks within the Open Forest habitats may alter natural mosaic burning patterns through tracks acting as fire breaks. Fourteen species of conservation significant fauna possibly present in the project area are known to be affected by altered fire regimes. This may be direct, through loss of shelter, food resources and/or nesting resources (e.g., tree hollows, fallen logs) or indirect, through the loss of prey species dependent on tree-hollows.

Associated with altered fire regimes is weed invasion. One possible consequence of weed infestation is an increased fuel load and the creation of feedback loops, fire subsequently facilitating encroachment of weed species that further increase fuel loads. Fire also enhances weed invasion of roadside vegetation (Milberg & Lamont 1995). Weed infestations and habitat degradation can have deleterious impacts on fauna, particularly reptiles, small mammals and insectivorous birds that forage on the ground (Adair & Groves 1998; Woinarski & Ash 2002; Maron & Lill 2005). Weeds displace food species for some fauna and can alter the structure of habitats. For example, Lantana *Lantana camara* deleteriously affects Albert's Lyrebird (Garnett & Crowley 2000) and Eastern Bristlebird (DoE 2016c).

The creation and maintenance of tracks and roads, in addition to increasing the likelihood of weed invasion, facilitates access to natural habitats by feral mammalian predators and Cane Toads *Rhinella marina*. Feral predators are known to use roads and tracks for hunting (Edwards *et al.* 2000) and for moving through woodland and forest (May & Norton 1996; Forman & Alexander 1998). Cane Toads are also known to use roads, tracks and other linear clearing to disperse (Seabrook & Dettmann 1996; Brown *et al.* 2006). Cane Toads have caused extensive mortality, through poisoning, of native frog-eating species (Phillips *et al.* 2003), including through consumption of eggs and tadpoles (Crossland & Alford 1998). The effects of Cane Toads do vary substantially between native species, as well as spatially and temporally for the same species. Some native species are known to benefit, either directly or indirectly, from the presence of Cane Toads (Crossland 2000; Shine 2010). The indirect effects of Cane Toads are poorly understood (Shine 2010). Their impact is greatest on an advancing front, with native species unfamiliar with toads, which is not the case at Main Range.

Although feral Dogs *Canis lupus familiaris*, Cat *Felis catus* and Red Fox *Vulpes vulpes* are all significant predators of native fauna, especially the latter two species, feral Pig *Sus scrofa*, better regarded as an omnivore, may be potentially more significant to some of the conservation significant fauna likely to occur in the project area. Pigs degrade habitat through surface soil destruction due to their foraging techniques. They up-root plants, facilitating erosion. Most damage occurs in areas where the soil is soft such as around wetlands, swamps, lagoons, creeklines and associated watercourses or in low-lying areas after rain. This reduces regenerating forest plants and facilitates the invasion of weed species (Alexiou 1983; Statham & Middleton 1987; Hone 1995). Pigs are largely omnivorous, favouring succulent vegetation, fruit, grain and animals including invertebrates, reptiles, eggs of ground-nesting birds or reptiles, small or young mammals and some carrion (Choquenot *et al.* 1993; Heise-Pavlov 2008) but are probably not significant predators of most fauna except local populations of earthworms (Choquenot *et al.* 1996). Although there is potential for direct predation of frogs by Pigs, the greatest impact is likely to be from increased silt on embryos and tadpoles (Hines & SEQTFRT 2002). Pigs may spread rootrot fungus (*Phytophthora cinnamomi*), responsible for dieback disease in native vegetation (Choquenot *et al.* 1996). There are no recent recorded occurrences *Phytophthora cinnamomi* in the survey area. Pigs are known from several areas in the park (DNPRSR (2013)). The field survey for this project confirmed that pigs are relatively common in the Thornton to Mt Mistake portion of the project area, including within Main Range National Park, and recent pig diggings were also detected at several locations in the Goomburra area, including on the escarpment between Cascades and Bald Rock. Relatively low levels of pig presence were observed in the Mt Mistake section.

Phytophthora is not the only pathogen or parasite that threatens fauna. Species such as Brush-tailed Rock-wallaby may be susceptible to toxoplasmosis and hydatidosis infection, carried by Cats (DoE 2016d). And a major threat to frogs is chytridiomycosis, the amphibian chytrid fungus disease. How the disease spreads has been a major topic for research. It is possible that Cane Toads may be a vector (Berger *et al.* 1999) and that chytrid may survive for extended periods in moist soil (Johnson & Speare 2005). There is also the possibility Chytrid is spread by humans (Mendez *et al.* 2008). Chytrid is widespread in the park (Harry Hines *pers comm.*). A Pest Plant and Pathogen Spread Prevention management strategy has been developed and implemented for Main Range National Park (DNPRSR 2013). Similarly, the project would install chemical footbaths and implement a pathogen mitigation policy for vehicles, equipment and humans.

Other threats include fragmentation of habitat as a result of disturbance to vegetation, disturbance of animals due to human presence and activities and altered hydrology and reduced water quality. Changes to local hydrology and water quality will be minimized through mitigation and management measures. Species particularly susceptible to the effects of fragmentation include Brush-tailed Rock-wallaby and Greater Glider. However, the clearing associated with the project would be restricted to regrowth on a disused forestry road. Less than one ha of *Eucalyptus* forest and 0.3 ha of rainforest would be modified (only where necessary, through brush-cutting) to allow passage along an unformed trail of up to 0.6 m width. Any effects associated with fragmentation will be negligible. The species most at risk of disturbance by humans is Eastern Bristlebird, which may abandon its nest simply due to human presence (DoE 2016c).

The Eastern Bristlebird occurs around Mallacoota in Victoria, in southern New South Wales from Barren Grounds to Jervis Bay and around the Queensland/New South Wales border (Higgins & Peter 2002; Garnett *et al.* 2011). The northern subspecies *monoides* is found in 12 locations (Garnett *et al.* 2011), including Conondale, Lamington, Mount Barney and Main Range national parks. The subspecies is thought to number less than 40 individuals (OEH 2012). A survey in 2007 found only 15 birds, distributed between Lamington, Conondale and Main Range national parks (Stewart 2012). There is possibly only a single pair remaining in the Conondale Ranges. The largest known colony, just south of Cunningham's Gap, was wiped out by fire in 1991 (Gregory 2007). The Mt Mitchell SRT section is proposed in part of this area on existing tracks and trails that are currently used by hikers. Figure 3.2 shows the locations and dates of historical records in this area.

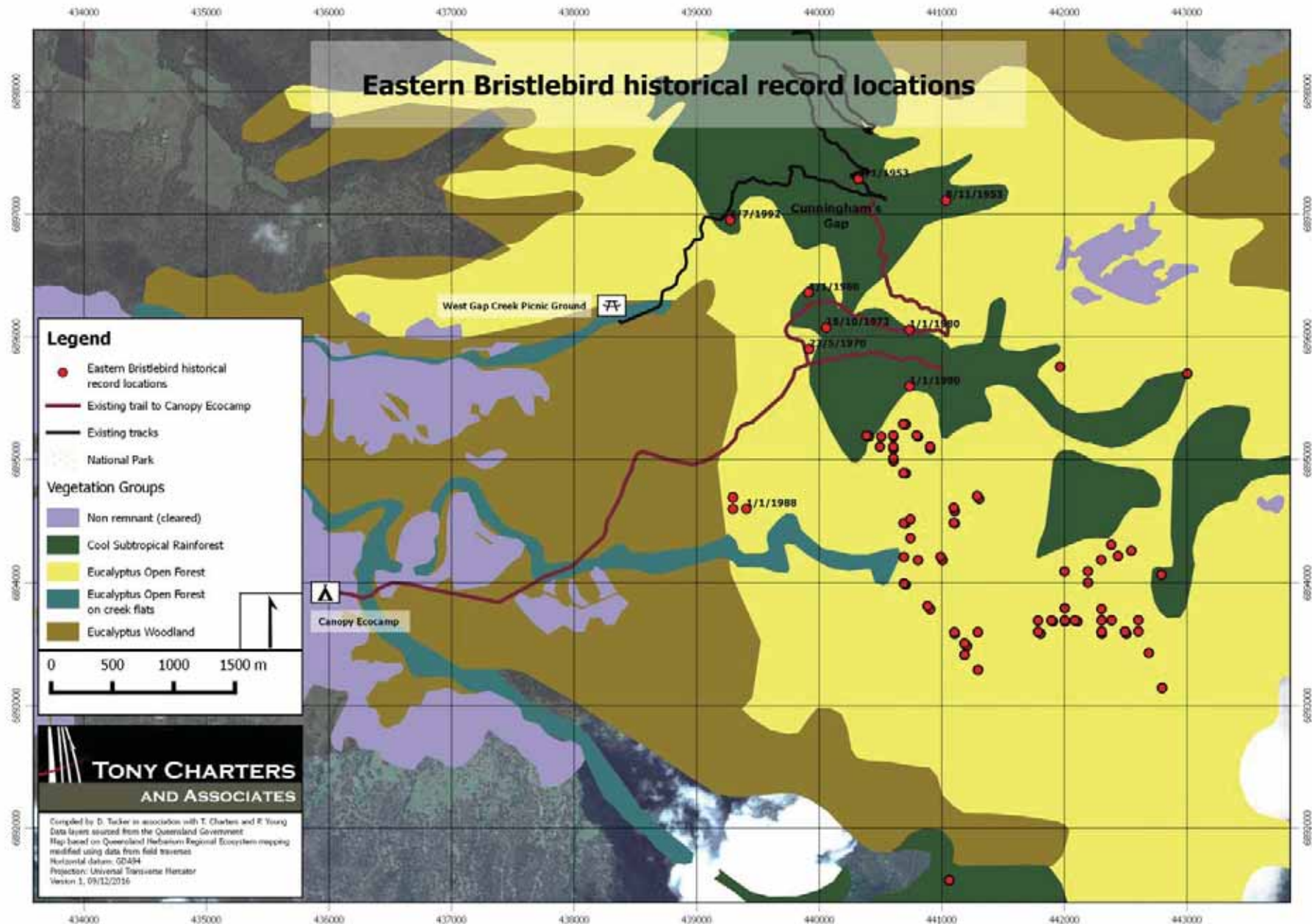


Figure 3.2 Eastern Bristlebird historical record locations

Red Goshawk, Glossy Black-Cockatoo and Coxen's Fig-parrot may all be subject to the illegal collecting of eggs and nestlings. Red Goshawk may also be susceptible to disturbance by bird-watchers through prolonged time spent too close to a nest (Marchant & Higgins 1993; DERM 2009) but with home ranges of 120 km² and 200 km² for females and males, respectively (Marchant & Higgins 1993), the likelihood of a nest visible from the proposed trail is very low. Glossy Black-cockatoo is remarkably tolerant of the presence of humans, especially when they are feeding. Little is known with regard to the level of egg and nestling collection (Holmes 2012). Coxen's fig-parrot is currently only known in the wild in Queensland from approximately 90 reliable records since 1970 and nest site surveys have detected evidence of current or past Coxen's fig-parrot breeding activity in 11 instances at eight localities, including Main Range National Park in 1996 (Coxen's Fig-Parrot Recovery Team 2001). The likelihood of a nest visible from the proposed trail is very low.

3.2.3. Aquatic Environment

The proposed trail traverses the watersheds of four major catchments. Along the eastern escarpment there is little or limited development of stream channels before run-off plunges over the steep rock face into the Laidley Creek catchment in the north, and Warrill Creek – Bremer River catchment south of the Little Liverpool Range. Consequently the east-flowing stream heads near the scarp are limited in extent and ephemeral.

The west flowing streams are well defined and have downcut extensive incised valleys which extend close to the scarp in places. Streams north of the Great Dividing Range (Dry, Flaggy, Blackfellow Creeks) form tributaries of Lockyer Creek. To the south, Dalrymple and North Branch Creeks flow into the Condamine River. The west flowing streams become permanent or semi-permanent close to their headwaters, for example the tributary of Dalrymple Creek which forms the Cascades.

The Winder Management Road follows the crest of the Mistake Range and does not cross any streams. The walking trails are largely confined to ridges. However, there are two crossings with permanent-semi-permanent water - the headwaters of Blackfellow Creek (Lockyer Creek catchment) between The Winder and Amphitheatre View Wilderness Ecocamp and the Cascades (headwaters of Dalrymple Creek) on the section linking the route along the scarp to the Woodcutters Ecocamp. These locations are shown on Figure 2.4. A small headwater gully is also crossed (Figure 2.6). The walking trail also crosses a semi-permanent watercourse (Millar Vale Creek) in two locations immediately below the Spicers Canopy Ecocamp within the Spicers Peak Nature Refuge. This creek holds small pondage areas comprises mostly rock based pools and steep weathered banks indicating they become relatively fast flowing during higher rainfall periods.

The Management Statement for Main Range National Park and Spicers Gap Conservation Reserve (State of Queensland, 2013) indicates that the Mt Mistake Spiny Cray *Euastacus jagara* is confined to the headwaters of a few streams within the park and is threatened by drought, fluctuating temperatures and pest animals including pigs and foxes (McCormack 2010). The River Blackfish *Gadopsis marmoratus* and Mountain Galaxias *Galaxias olidus* also occur in the upper reaches of streams in the park. Both species have restricted distributions in Queensland.

3.2.3.1. Mt Mistake Spiny Cray

Mt Mistake Spiny Cray *Euastacus jagara* is assessed by the IUCN as Critically Endangered (Coughran & Furse 2010a, b). All *Euastacus* species in Queensland are officially *no take* species under the *Fisheries Act 1994* and must be released if captured (DPIF 2007), though the species is not otherwise protected. The species was described in 1988 from six museum specimens collected in 1973 (McCormack *et al.* 2010). The species is known only from the headwater reaches of five streams in rainforest in the Mistake Mountains and its estimated extent of occurrence is very small, if apparently uncertain. Coughran & Furse (2010b) state that it is less than 10 km² but Coughran & Furse (2010a) state that it is approximately 21.5 km². There is no population information for the species, which is known from only the original six specimens (Coughran & Furse 2010b), though the species has been recorded in reasonably high numbers (Coughran & Furse 2010a).

Originally described only from Flaggy Creek, the species was subsequently found in Shady Creek. Both creeks are upper tributaries of Blackfellow Creek. It has also been found in three branches of Dalrymple Creek (McCormack 2010). There is no WildNet record for Main Range National Park but there are four records in the ALA database (ALA 2016). These are for Araucaria Falls, Dalrymple Creek and two records for the one location on an un-named tributary of Dalrymple Creek.

The species is threatened by fire, collecting, changes to hydrology, and habitat loss. Cane Toads are considered a potential threat and other *Euastacus* species are vulnerable to feral predators. The species is highly vulnerable to climate change, an increase in temperature could eradicate the species (Coughran & Furse 2010b). No specific conservation measures exist for the species, despite its range falling within a national park (Coughran & Furse 2010a).

3.2.3.2. Fish

A search of the ALA (ALA 2016) and WildNet (DEHP 2016c) databases identifies four species of fish occurring in or near Main Range National Park. The PMST (DoE 2016c) predicts the occurrence of two additional species (Table 3.7).

Table 3.7. Fish species known or predicted to occur in Main Range National Park and its immediate environs. Status: E = Endangered, V = Vulnerable

Species	Status		Comments ²
	EPBC Act	NC Act	
Australian Smelt <i>Retropinna semoni</i>	-	-	One ALA record (ALA 2016) and one WildNet (WN) record (DEHP 2016c).
Mountain Galaxias <i>Galaxias olidus</i>	-	-	207 ALA records and 260 WN records.
Mary River Cod <i>Maccullochella mariensis</i>	E	-	Predicted by the PMST. No ALA or WN record. Occurs mainly in relatively undisturbed tributaries (Wager & Jackson 1993), preferring relatively large and deep (>0.8 m) shaded pools with abundant, slowly flowing water (Simpson & Jackson 2000). No suitable habitat in the project area and the species is not expected to occur.
Murray Cod <i>Maccullochella peelii</i>	V	-	Predicted by the PMST. No ALA or WN record. Occurs in a wide range of habitats from clear rocky streams to slow-flowing, turbid lowland rivers and billabongs. Considered a main-channel specialist, favouring deeper water around boulders, logs and undercut banks ((Allen <i>et al.</i> 2002; National Murray Cod Recovery Team 2010). No suitable habitat present and the species is not expected to occur.
River Blackfish <i>Gadopsis marmoratus</i>	-	-	One WN record.
Southern Purplespotted Gudgeon <i>Mogurnda adspersa</i>	-	-	One WN record.

The Mountain Galaxias is widely distributed in south-eastern Australia and may be abundant in locations without trout. The species occurs in clear pools in small flowing streams. Australian Smelt, River Blackfish and Southern Purplespotted Gudgeon are more common in slow-flowing streams (Allen *et al.* 2002) and may be absent from most, or all, of the project area.

3.2.4. Aesthetic Values

The aesthetic values of the region through which the Scenic Rim Trail will be traversing are quite diverse. While all of the physical values of the Scenic Rim Trail have aesthetic values, those that would be regarded as having the greatest aesthetic value may include:

- The escarpment and peaks

- Sub-tropical rainforest and Warm-Temperate Rainforests
- Cascades, Mountain streams
- Rock ‘gardens’ with a diversity of plant forms creating a lush tropical environment
- Very large single species forest trees – individual specimens and groups of single species
- Dramatic viewsapes mainly to the valley below and surrounding Scenic Rim Mountains to east and south (but also to the west at some points)
- Pure Picabeen Palm and Walking Stick Palm stands
- Abundant birdlife
- Large buttressed trees
- Pure groves of soft ferns
- Clumps of flowering Spear Lily and Blue-leaved Grass Tree.

The protection and presentation of these values will be of paraMt consideration. The trail will deviate to enable walkers to appreciate a range of these significant aesthetic values. Such deviations would be very short (around 20 m in length) and would be planned in consultation with QPWS.

3.2.5. Heritage

3.2.5.1. Cultural Heritage

There are a number of Traditional Owner groups that associate with the broader area, including the Githabul people, whose lands extend into New South Wales; the Western Wakka Wakka to the west; and the Jagera People to the east of the escarpment. It has been reported that about 200 Githabul people live in the Queensland towns such as Warwick, Killarney and Rathdowney (Trevor Close, Githabul spokesperson, quoted in *The Australian*, 28-2-07). The forests, streams and landforms of Main Range National Park are of intrinsic value to the local Aboriginal people as part of the cultural landscape of their country. Aboriginal place names are known for some of the prominent landforms in the area. Jirramun – Wilsons Peak; Barguggan - Spicers Peak; Cooyinnirra - Mount Mitchell Niamboyoo - Mount Cordeaux; and Mount Roberts (Bunkoo) (Steele, 1984).

Gainsdale Pty Ltd is acutely aware of its obligations under the Aboriginal Cultural Heritage Act 2003 (Qld) regarding the management of Indigenous cultural heritage and its legislative “Duty of Care”. Gainsdale Pty Ltd will comply with its legislative obligations. This document makes no assessment of indigenous cultural considerations at this stage. Such assessment will be undertaken within the context of the legislative framework, the Aboriginal Cultural Heritage Act 2003 (Qld), with the involvement of the Traditional Owners for the area. Gainsdale Pty Ltd has contacted Traditional Owners that may have an interest in the Project area and will continue to consult with Traditional Owners with the aim of presenting the project in a way that respects the Indigenous heritage values and provides a valuable interpretive experience. Gainsdale Pty Ltd’s strategy is to communicate with Traditional Owners as part of the planning process with a view to proactively:

- informing them of the Scenic Rim Trail proposal;
- discussing the management of Indigenous cultural heritage;
- meeting with the appropriate people to discuss the project and to see how they would like to become involved in the assessment of cultural values;
- sharing Gainsdale Pty Ltd’s aspirations in relation to involving Aboriginal people with land management, accommodation management and guest services; and
- establishing some agreed lines of communication and information sharing.

For its part, Gainsdale Pty Ltd hopes that Traditional Owners will wish to be involved with:

- cultural assessment of trail alignments;
- interpretive content development (spiritual significance, bushfoods and medicine, Aboriginal trails, hunting, festivals, shelters etc.);
- employment opportunities; and
- contracted services. Given the large land holdings of Gainsdale Pty Ltd, employment opportunities extend beyond tourism into agriculture and protected area management, providing a diversity of opportunity.

Indigenous cultural interpretation will be a highly desirable part of the interpretive theming.

Gainsdale Pty Ltd specialists will follow guidelines set out by the Australian Heritage Commission Ask First publication and the Queensland Department of Aboriginal and Torres Strait Island and Multicultural Affairs Protocols for consultation and negotiation with Aboriginal People.

3.2.5.2. Historical Heritage

The steep scarps of the Mistake Mountains have remained a significant barrier to human access. Since European settlement, access has been largely confined to two main routes, Dalrymple Creek/Goomburra Valley on the south-eastern Darling Downs and the Laidley Creek Valley on the north-eastern side. Spurs on private land have also been used to provide access to timber and grazing on the peripheral spurs.

The upper reaches of the Goomburra Valley were initially part of a cattle run operated by Ernest Dalrymple, a close friend of the Darling Downs pioneers the Leslie brothers (<http://www.npsr.qld.gov.au/parks/main-range/culture.html>website). The upper-most reaches of the catchment were excised as state forest in the 1920's. Logging of rainforest timber had commenced in the 1870's. After the change of tenure to state forest, harvesting of native softwood and hardwood species occurred and experimental plantings of native and introduced conifers were established. The Mistake Mountains provided cabinet timbers especially Red Cedar (*Toona ciliata*) and Rosewood (*Dysoxylum fraserianum*) as well as timbers used in flooring and other internal uses, railway carriage construction and plywood.

An area of state forest on the northern end of the plateau was converted to national park when public interest in a conservation estate along the Scenic Rim gathered momentum in the 1960's-1970's. Around this time, logging of rainforest species was winding down as most accessible timber had been removed. Some limited logging of *Eucalyptus* and Brush Box continued. The national park was extended in 2006 through the South East Queensland Forest Agreement when the remaining state forest (Goomburra section) was incorporated into an expanded Main Range National Park. This conversion saw an end to logging on state lands on the plateau.

The logging, haulage and sawmilling history of the area has resulted in a colourful legacy of innovation and hardship and reminders of the era remain evident in places – examples include the location of a chute down the side of plateau, former sawmill sites and the Winder site. The dangerous working conditions resulted in serious injury and death among the pioneering timber families. The use of bullock teams and then dozers, trucks and tractors that were small in comparison to modern counterparts has probably had an important outcome as the activities often left a comparatively small imprint of disturbance on the landscape.

The more open types of *Eucalyptus* country have been grazed by cattle utilising native grasses and herbs, and there has also been a focus upon honey production. The Mistake Range has a reputation as an attractive and challenging destination for bushwalking and orienteering.

The Scenic Rim Trail has a number of historical cultural themes which would be developed as part of the presentation strategy and incorporated into interpretive materials and guide commentary. Interpretive themes would include:

- Forestry
 - the forestry history of the area
 - prized species – red cedar, hoop pine,
 - methods of extraction – backed up by specific relics along this section of the trail that demonstrate the forestry practices:
 - old bullock wagon
 - surveyor's shield tree
 - stumps
 - woodcutters hut
 - road construction
 - snigging tracks
 - log ramps
 - chute
 - the winder
 - research plots – plantation (species exotic and native).

The unlogged areas provide a opportunity for interpretation around the themes of conservation and world heritage management.

- Mining and transport:

The old gold mining shafts (unsuccessful) at Mt Cordeaux facilitates a discussion about pioneering endeavours. As walkers come closer to Cunningham's Gap the noise of trucks on the road becomes apparent and opens up an opportunity to interpret themes around access to the coast and transport. This has both Indigenous and European relevance. The memorial to Cunningham the explorer is located near the end of the Mt Cordeaux Track and contributed to the historical interpretation.
- Agriculture:
 - Agriculture land allocation
 - grazing
 - honey production.

These elements are located along the trail and provide the guides with the ability to build the theme as the trail continues.

- Conservation: The story of the origins of the national park listing, the subsequent expansion of the national park estate over the entire range and the World Heritage listing are key components of the cultural history of the area. Conservation as a theme would be woven through the interpretive elements of the Scenic Rim Trail.
- Protection of cultural finds: Cultural elements that belong to post European settlement have been will be photographed, located by GPS, noted and reported to QPWS. Over time other elements such as timber getting equipment, farm equipment, road building equipment, and items such as fences are very likely to be encountered. These items represent significant local historical interest.

Guests would be briefed on the strict requirement of not touching or removing items of heritage significance.

3.2.6. Natural Hazards

3.2.6.1. Fire

The Scenic Rim Trail is located within a sub-tropical climate and, for the most part is in high altitude areas approximately 900-1150 m. The region normally experiences summer rains. From Mt Mistake the Scenic Rim Trail traverses primarily closed forest environments where fire risk is low and the trail

is both shady and moist under foot. The greatest risk of fire is in Open Forest and Woodland areas, principally the walk from Thornton to the start of the closed forest south of Mt Mistake Farmhouse. Around 10% of the trail route through National Park is *Eucalyptus* Open Forest.

QPWS undertakes prescribed burning operations in the milder months and these operations will require liaison to ensure walkers are not present during burning operations.

3.2.6.2. Other Natural Hazards

Branch and Tree Fall

Branch fall occurs on a regular basis in both Rainforest and *Eucalyptus* forest. It is more common on windy days but can occur at any time posing a constant risk. Tree fall occurs under high wind conditions associated with severe thunderstorms, late summer low pressure systems and strong south-westerly winds. Thunderstorms occur regularly in the Scenic Rim ranges in the summer half year. Strong south-westerlies are often associated with winter fronts and although exposed ridgetops are unpleasant during these conditions, the rainforest understorey can remain relatively sheltered. Users need to be made aware of the increased risk of falling branches during windy conditions.

Landslips

The eastern scarp has sheer cliffs which are approached in places along the route. Landslips occur during heavy rain events and recent slips are present. The trail by-passes the unstable heads of slips.

Dangerous Plants

Giant Stinging Tree and plants armed with spines occur widely in the rainforest. They pose a high risk and need to be taken onto account in Safe Work Practices and duty of care during construction and operation of the road and trail network, through provision of relevant information.

4. POTENTIAL EFFECTS AND THEIR MANAGEMENT

4.1. POTENTIAL EFFECTS, MITIGATION AND MANAGEMENT MEASURES

4.1.1. Risk Assessment

The assessment of potential effects on conservation significant flora and fauna are discussed in the following sections. Risk assessment has been undertaken for those values known or likely to be present in the project area, and the results are provided in Sections 4.1.3, 4.1.4 and 4.1.5.

This process has been undertaken to identify potential impacts and enable appropriate avoidance, mitigation and management measures to inform project design where moderate or higher impacts were predicted. This has been an iterative process involving project modification throughout the planning stages and the adoption of management measures resulting in a “low” risk assessment for all potential threats/impacts.

Risks are assessed by identifying potential impacts, determining the likelihood of those impacts occurring, and describing the consequences of those impacts should they occur, applying the categories shown in Table 4.1.

Table 4.1 Qualitative Risk Matrix

Likelihood Level	Consequence Level					Risk Rating
	Insignificant	Minor	Moderate	Major	Catastrophic	
Almost certain	Orange	Red	Red	Red	Red	Extreme
Likely	Yellow	Orange	Orange	Red	Red	High
Possible	Yellow	Yellow	Orange	Red	Red	Moderate
Unlikely	Yellow	Yellow	Yellow	Orange	Red	Low
Very Unlikely	Yellow	Yellow	Yellow	Yellow	Orange	Low

The consequence of each impact is categorised as ‘catastrophic’, ‘major’, ‘moderate’, ‘minor’ or ‘insignificant’ in terms of its effect on the element in question. Briefly put,

- ‘catastrophic’ impacts would result in the extinction of a species
- ‘major’ impacts may be notably detrimental to the species on a population scale
- ‘moderate’ impacts may result in a substantial change to a local population
- ‘minor’ impacts may result in small decreases to a local population that would be overcome without mitigation, and
- ‘insignificant’ impacts are those that are likely to be undetectable.

4.1.2. Vegetation

4.1.2.1. Regional Ecosystems

Potential Impacts

The placement of trails will largely be confined to brushing of ground layer species where dense, and cutting a narrow path up to 0.6 m wide through dense viny plant growth in formerly logged and wind affected areas. There is no requirement for any removal of canopy, sub-canopy and mid-storey trees within remnant native vegetation or removal of larger sized trees at any site. The proposed disturbance, whilst affecting localised patches of ground layer vegetation, is not likely to have any major impacts on the local composition or ecological integrity of the surrounding vegetation. The brushing and cutting to create a definable path through thick fern and viny

regrowth is ephemeral and vegetation will quickly fill the gaps created if the passage becomes unused. Bare footpads formed by trail use will repair over a longer time frame, based upon the types of soil described as being present which are relatively friable and not prone to erosion.

The new sections of walking trail pass through three regional ecosystems (12.8.7, 12.8.8, 12.8.16) with a Vegetation Management status Of Concern (Table 4.2). Within National Park, approximately 0.2 ha of ground disturbance (stabilisation of loose boulders as well as the formation of a linear bare pad due to constant trampling by hikers along with some soil compaction) is expected to occur within RE 12.8.7 Warm-Temperate Rainforest (Table 4.2). A similar linear pad (total area 0.02 ha) is expected to develop on the ground surface where the trail traverses two small patches of Wet Sclerophyll Forest with Sydney Blue Gum and Brush Box (RE 12.8.8). North of the National Park boundary, there will be localised ground disturbance (0.04 ha) within RE 12.8.16 for Class 4 trail construction on short sections of very steep slope.

The formation of linear bare patches and localised trail construction is expected to disturb around 0.18 ha of the ground stratum of Cool Subtropical Rainforest (Least Concern RE 12.8.4/5). The requirement for trail construction is limited to several short sections of very steep slope and steep creek banks with loose soil and rock. Installation of permanent raised board walks or comparable structures has been recommended in these areas (Macnish and Schneider 2016, Appendix 4) due to soil creep. The Winder Management Road will require removal of colonising vegetation and soil disturbance from a further 1.5 ha of Cool Subtropical Rainforest and 0.05 ha of Eucalyptus Open Forest (RE 12.8.14).

Table 4.2 Estimated extent of vegetation disturbance within regional ecosystems traversed by Winder Management Road, accommodation nodes and new Class 5 trails (all disturbance indicated in table is within national park apart from RE 12.8.16).

Regional Ecosystem	Description	VMA Status	Approx. area with rainforest coloniser species removed to re-open Winder Management Road	Approx. area of remnant vegetation subject to ground disturbance	Approx. area of non-remnant vegetation subject to ground disturbance
12.8.1	New England Blackbutt Tall Open Forest	Least Concern		0.07 ha	
12.8.4/5	Cool Subtropical Rainforest	Least Concern	1.5 ha	0.18 ha	0
12.8.7	Warm-Temperate Rainforest with Lilly Pilly	Of Concern	-	0.2 ha	0
12.8.8	Wet sclerophyll forest with Sydney Blue Gum	Of Concern	-	0.02 ha	0
12.8.14	Grey gum – Thin-leaved Stringybark, Black Box, Yellow Box Open Forest	Least concern	-	0.14 ha	0
12.8.16	Narrow-leaved Ironbark – Forest Red Gum Woodland (confined to private land)	Of Concern	0	0.04 ha	0
12.8.19	Heathland and rock pavement	Of Concern	-	0	0
Non-remnant	Cleared				0.02
TOTAL			1.5 ha	0.65 ha	0.02

The Amphitheatre View Wilderness Ecocamp and viewing platform, Woodcutters Ecocamp and the 250 m long deviation around Woodcutters Ecocamp on the Cascades Trail will necessitate removal of ground stratum vegetation and shrubs from a small area (around 0.14 ha) of RE 12.8.14, a Least Concern *Eucalyptus* Open Forest. The placement of trails will largely be confined to brushing of ground layer species where dense, and cutting a narrow path up to 0.6 m wide through dense viny plant growth in formerly logged and wind-affected areas.

There is no requirement for any removal of canopy, sub-canopy and midstorey trees within remnant native vegetation or removal of larger sized trees at any site. The proposed disturbance, whilst affecting localised patches of ground layer vegetation, is not likely to have any major impacts on the local composition or ecological integrity of the surrounding vegetation. The brushing and cutting to create a definable path through thick fern and viny regrowth is ephemeral and vegetation will quickly fill the gaps created if the passage becomes unused. Bare footpads formed by trail use will repair over a longer time frame, based upon the types of soil described as being present which are relatively friable and not prone to erosion.

Mitigation and Management

A Construction Management Plan for the project is provided as Appendix 8 and a draft Workplace Health and Safety Plan is provided as Appendix 9. Specific Construction Environmental Management Plans are provided for the Ecocamps (Appendix 10), Trails (Appendix 11) and reopening of the Winder Management Road (Appendix 12).

The application of avoidance and mitigation strategies will minimise the extent of vegetation disturbance required. However, disturbance of vegetation is required within an area of 2.16 ha most of which is associated with removing regrowth vegetation from the disused road. Brushing and cutting of narrow linear footpads and paths through dense ground and near-ground vegetation to avoid diffuse effects of trampling represents a more ephemeral impact as these areas will regrow if left untraversed.

The impact on individual ecological communities and species assemblages as a result of construction of the road, trails and overnight nodes will be negligible. The proposed impacts will not interfere with ongoing plant reproduction, dispersal and regeneration except at a highly localised scale. The project has taken the largely weed free status of the area into account, and the mitigation measures for construction and subsequent operation of the trails aim to minimise the risk of new weed introductions as well as limiting the spread of weeds which are present. The risk of introducing plant pathogens especially Myrtle Rust will also be dealt positively with by implementing a number of risk-reducing measures. The ecoguides accompanying hikers will play an important role in ensuring walkers adopt cleaning regimes to reduce weed dispersal and providing feedback on the condition and health of vegetation along the route.

The proposed impacts to Of Concern regional ecosystems are highly localised and reversible. They include stabilisation of the route where it descends or ascends steep rocky slopes in Warm-Temperate Rainforest to prevent hikers dislodging material. An example of a rocky slope traversed by a Class 5 standard trail is present between Sylvester's Lookout and Hole-in-the-Wall exit (Photo 5).

Proposed impacts within the Sydney Blue Gum Wet Sclerophyll forest will be confined to brushing a short path through dense Gristle Fern to prevent diffuse trampling. Disturbance to smaller, woody plants will be avoided by detouring the route around individuals. A similar approach is feasible in the Of Concern *Eucalyptus* Woodland as the stems of woody species are widely spaced.

The following mitigation measures will be employed against the risk of the introduction and spread of weeds through material and equipment and through the passage of construction personnel:

- externally sourced material (rock and gravel) will be obtained from a source certified as low risk for weed and disease contamination;

- construction equipment and vehicles cleaned before entering the national park utilising procedures described in https://www.daf.qld.gov.au/_data/assets/pdf_file/0011/58178/IPA-Cleanup-Procedures.pdf
- When operational, clean footwear before entering the National Park.

In addition, the proponent will be responsible for conducting annual surveys for weeds along the track and at the overnight nodes immediately after construction, and annually for two years. It is recommended that Scenic Rim Trail ecoguides receive training in weed identification and report weed outbreaks and any indicators of declining health of vegetation along the route.

The following mitigation measures will be employed against the risk of the introduction and spread of Myrtle Rust and other pathogens:

- chemical footbaths provided at Mt Mistake Farmhouse or nearby boundary of National Park and at Amphitheatre View Wilderness Camp and Woodcutters Ecocamp;
- users advised of risks and safeguards; and
- ensuring hikers who have come from myrtle-rust affected areas wear clean clothing within the National Park.

4.1.2.2. Winder Management Road

Potential Impacts

The expected and potential impacts of re-opening of the disused section of the Winder Management Road on flora values include:

- removal of understorey grasses, forbs and shrubs in the *Eucalyptus* Open Forest section in the far northern extremity of the road;
- removal of regrowth rainforest trees, shrubs, vines, ferns and forbs;
- damage to living plants from piling of removed material;
- possible loss of individuals belonging to species listed under the *Nature Conservation Act 1992* within the road footprint;
- mechanical damage to buttresses and butts of large roadside trees;
- risk of spread of weeds and introduction of new weeds in the *Eucalyptus* forest section;
- risk of introduction of shade tolerant weeds in the rainforest;
- risk of introduction and spread of pathogens; and
- secondary impacts that may result from altered drainage and root disturbance.

The potential impacts of the operational component of the proposal on flora values are:

- risk of spread of weeds and introduction of new weeds in the *Eucalyptus* forest section and potential for introduction of shade tolerant weeds in the rainforest;
- risk of introduction and spread of pathogens; and
- damage to roadside vegetation.

Construction Mitigation and Management

The former road width was generally 3.5-4 m but in places is up to 8-10 m in width, providing scope for avoiding and detouring larger regrowth rainforest trees (>15-20 cm dbh) within the proposed 2.5 m wide corridor. Mulching of felled woody plants is the preferred disposal method with mulch spread evenly over the ground surface adjacent to the road. The road has been cut into the contour on slopes. Generally it has stood up well to erosion. However, earthworks will be

required to repair localised wash-outs on long slopes and alter drainage to prevent recurrence of erosion. Similar management roads in the national park are colonised with ferns, forbs, shade-tolerant grasses apart from wheel ruts and this process should be allowed to take place after the surface has been re-profiled. A Construction Management Plan is provided as Appendix 8 and a specific Construction Environmental Management Plan for the reopening of the Winder Management Road is provided in Appendix 12. Specific mitigation measures include:

- Removal of regrowth vegetation – minimise impacts to vegetation by confining vegetation removal to a 2.5m wide corridor within the original footprint. Retain larger regrowth trees close to road edges.
- Disposal of felled woody vegetation – mitigate impacts by using preferred disposal method (conversion to mulch). Mulch is to be evenly spread over ground surface away from road. Avoid piling mulch against tree bases. Any material not mulched, e.g. Giant Stinging Tree (see below) to be spread thinly over ground surface adjacent to road.
- Tree buttresses and bases – avoid mechanical damage to buttresses and butts of trees adjacent to the road alignment.
- Places where former road no longer evident – minimise further impacts in these heavily disturbed areas by applying same measures as other parts of route, i.e. confine vegetation removal to width of 2.5 m.
- Slopes – minimise impacts of erosion on road surface and adjacent forests by repairing washed out patches, constructing whoa-boys to restrict and divert surface flow and appropriate off-road drainage. Sediment traps to be used where diversion risks wash of soil into adjacent watercourse until bare soil has been re-stabilised by vegetation.
- Seasonally wet, boggy patches – mitigate impacts (e.g. pig wallows) in localised areas by using drainage and resurfacing to maintain serviceability of road. Minimise weed and pathogen contamination risk by using suitable rock or gravel obtained from a certified source.
- Lay down of material or equipment and any over-nighting by construction personnel – minimise disturbance by confinement to road alignment or to small pad located within the more heavily disturbed ridgetops.
- Weeds and pathogens – minimise risk by wash down of equipment and vehicles to be used on site and removal of dried mud and dirt from footwear. Wash down to follow recommendations provided at https://www.daf.qld.gov.au/data/assets/pdf_file/0011/58178/IPA-Cleandown-Procedures.pdf.
- Salvage of Christmas Orchid, Matrush, juvenile Tree Ferns in rainforest and Tussock in Open Forest – mitigate roadside disturbance by using salvaged plants for replanting on exposed soils where feasible, or for use in other places as advised by QPWS.
- Giant stinging tree and plants armed with spines – minimise injury risk by making personnel aware of their presence and recognition prior to commencement of work. Avoid mulching Giant Stinging Tree as stinging hairs become airborne and can result in severe irritation and bleeding from nasal passages.

Operation Mitigation and Management

Weeds – minimise risk by removal of dried mud from footwear prior to accessing road and walking trail. Within the Eucalyptus forest-Rainforest ecotone near the start of the Winder Management Road – minimise spread of possible recently arrived weed Broom Milkwort (*Polygala virgata*) through working with QPWS to eradicate this small infestation.

Pathogens - minimise risk by removal of drier mud from footwear prior to accessing road and walking trail. Provide and maintain chemical footbath at or near northern entrance to Main Range National Park.

Vegetation – Use signage to prevent access to any other tracks (e.g. former snig tracks) present along route.

Fallen timber – avoid vehicle damage to roadside vegetation from detouring around fallen timber by removing debris from road prior to passage.

Giant Stinging Tree and plants armed with spines – minimise risk by providing information to users.

4.1.2.3. Class 5 Walking Trail

Potential Impacts

The expected and potential impacts of establishing the Class 5 trail network include:

- brushing of footpad through dense patches of ground layer plants;
- trimming/cutting a narrow path through low viny regrowth in logged rainforest/former snig tracks and wind-prone rainforest on exposed upper slopes and ridges;
- removal of ground layer vegetation on very steep slopes and banks (for path construction);
- re-arrangement of rocks/boulders (stabilisation on steep rocky slopes)
- risk of introduction of shade tolerant weeds; and
- risk of introduction and spread of pathogens.

The potential impacts of the operational component of the proposal on flora values are:

- trampling and ripping of ground stratum plants and vines;
- risk of introduction and spread of shade tolerant weeds; and
- risk of introduction and spread of pathogens.

Construction Mitigation and Management

A Construction Management Plan is provided as Appendix 8 and a specific Construction Environmental Management Plan for Trail Construction is provided in Appendix 11. Prior to establishing any trail, the proposed area would be flagged and assessed by relevant experts, including a highly experienced forest ecologist and interpretive planner. Track alignments will be designed to minimise vegetation removal and avoid any species that may be compromised by the existence of a trail. QPWS would be invited to be engaged in the final route selection and design.

The establishment of the trail will result in large sections where no modification of the natural environment is required. Localised impacts are associated with construction of an appropriate cut path on two very steep sections of slope (40⁰) and an incised creek crossing to avoid degradation of the ground surface and ground layer plants and subsequent rain-wash of the disturbed soil surface, and, forming a stabilised route on a small number of steep, bouldery slopes. Construction equipment will be limited to hand-held items. While a marker system is generally not used with Class 5 trails, a simple marker system consistent with QPWS signage standards is recommended for use in places. This is largely for safety; markers will reduce risk of hikers unaccompanied by ecoguides (i.e. users other than Scenic Rim Trail hikers) becoming lost or disorientated, as there are places where ridge convergence and lack of a visible horizon make determining the direction difficult without navigation aids. In addition, rapid summer growth flush of ferns and other ground layer vegetation and tree and branch fall is likely to obscure the type of rudimentary footpad likely to develop with use. Mitigation measures include:

- General route - avoid disturbance of vegetation and tree roots as per guidelines for Class 5 trails. Limit vegetation disturbance to brushing footpad in limited areas with very dense ground layer vegetation (mainly Shield Fern or Gristle Fern).
- Dense low vegetation, usually with abundant vines – avoid diffuse hiker impacts by cutting narrow path (0.6 m wide).

- Very steep grades with soil – avoid removal any woody plants. Minimise erosion risk and diffuse damage to vegetation by hikers by constructing a formed track. Use raised galvanised frame steps, stone steps or contoured walking track based on site-specific engineering advice in the steep sections.
- Steep grades with boulders – avoid removal of woody plants. Minimise diffuse damage to plants, and mosses and lichens covering boulders by stabilising rocks along a defined path. Route may require temporary markers until it becomes evident from use which smooths rock surfaces (a reference area is the track worn on the steep slope between Sylvesters Look-out and the Hole in the Wall track).
- Creek crossing on Winder Management Road - Amphitheatre View Wilderness Ecocamp link track – avoid removal of woody plants. Minimise erosion and sedimentation risk by selecting crossing point where bank is less steep and cutting track into bank. Install large stepping stones to enable walkers to cross the watercourse without stepping onto the creek bed.
- Converging ridgetops in dense rainforest/regrowth rainforest – minimise risk of unaccompanied hikers becoming disoriented by using markers.
- Viewing points along scarp edge – avoid diffuse impacts on ground layer vegetation by hikers walking to scarp edge by providing marked access to 2-3 locations for views/rest-points (potential sites shown on Figures 2.1 & 2.3). No access to scarp edge in other places.
- Weeds and pathogens – minimise risk by cleaning hand equipment to be used on site and removal of dried mud and dirt from footwear. Avoid any patches of recently dead trees when placing the walking trails. Use of signage in these areas may be appropriate.
- Giant stinging tree and plants armed with spines – minimise risk by making personnel aware of their presence and recognition prior to commencement of work.

Operation Mitigation and Management

A professionally developed track monitoring program would be developed and funded by Gainsdale Pty Ltd. The intent would seek to develop a cooperative, longitudinal monitoring program with the University of Queensland to monitor track conditions at key points along the trail. This monitoring program would be funded by Gainsdale Pty Ltd under an Augmentative Research Grant or similar to achieve ongoing monitoring and an excellent applied research study for undergraduates and postgraduates. In the event that UQ did not want to engage in the project, Gainsdale would engage contractors to conduct the monitoring program.

The monitoring program would:

- Establish a fixed-point camera position at key points along the trail (e.g. steep sections, creek crossings, ecotone boundaries) to capture change over time;
- Establish fixed-point camera positions at key points around the two Ecocamps on National Park;
- Survey of plants and weed species at several key points, including Bunya Mountains Bluegrass habitat, to measure any impacts on species composition and introduction of weed species;
- Survey track condition, width, drainage, soil loss, etc.; and
- Other parameters as recommended by QPWS and our specialist team.

Practical measures to manage the impacts of operation include:

Vegetation and soil – avoid damage from trampling and ripping (vines) by maintaining paths cut through dense regrowth and vine.

Viewing points along scarp edge – avoid diffuse impacts on ground layer vegetation by using 2-3 marked access points.

Weeds – minimise risk by removing dried mud from footwear prior to accessing walking trails.

Pathogens - minimise risk by removing drier mud from footwear prior to accessing walking trail. Provide and maintain chemical footbath at or near entrance to route.

Giant stinging tree and plants armed with spines – minimise risk by providing information to hikers.

Large tree falls and land slips – avoid these areas. Liaise with QPWS to re-route trail as soon as feasible. Ecoguides responsible for reporting affected areas.

4.1.2.4. Amphitheatre View Wilderness Ecocamp and Lookout and Woodcutters Ecocamp

Potential Impacts

The expected and potential impacts of establishing Ecocamps in the understorey of *Eucalyptus* Open Forest include:

- removal of ground layer vegetation and shrubs to accommodate structures;
- growth flush of ruderal weeds on exposed soil and risk of introduction of new weeds;
- risk of introduction and spread of pathogens; and
- changes in understorey species composition and increased abundance of Lantana due to cessation of periodic planned burning (e.g. 8-20 year intervals) in patches containing the facilities.

The potential impacts of the operational component of the proposal on flora values are:

- risk of introduction of weeds;
- risk of introduction and spread of pathogens;
- increased local nutrient loads; and
- damage to plants.

Construction Mitigation and Management

A Construction Management Plan is provided as Appendix 8 and a specific Construction Environmental Management Plan for Ecocamp construction is provided in Appendix 10.

Removal of vegetation – avoid removal of larger woody plants. Avoid damage to surrounding vegetation by spreading cut material over surrounding ground surface rather than piling.

Weeds and pathogens – minimise risk by clean/wash-down of equipment to be used on-site and removal of drier mud from footwear.

Operation Mitigation and Management

Vegetation and soil – avoid damage to vegetation surrounding the Ecocamp by disposing of organic waste in designated facility and using access paths.

Pathogens - minimise risk of spread by removal of mud from footwear and prior to accessing road and walking trail. Provide and maintain chemical footbaths at both Ecocamps for use at start of days walk.

4.1.2.5. Banshee Fire Line and Cascades Trail deviation at Woodcutters Ecocamp

Potential Impacts

The expected and potential impacts of establishing the walking trail in the understorey of *Eucalyptus* Open Forest include:

- removal of ground layer vegetation and shrubs including the weed Lantana;
- risk of introduction and spread of pathogens;
- growth flush of ruderal weeds on exposed soil and risk of introduction of new weeds;

The potential impacts of the operational component of the proposal on flora values are:

- risk of introduction of weeds although there will be a local reduction in the abundance of Lantana;
- risk of introduction and spread of pathogens;
- secondary impacts that may result from altered drainage; and
- damage to plants.

Construction Mitigation and Management

Removal of vegetation – avoid removal of larger woody plants. Avoid damage to surrounding vegetation by mulching or spreading cut material over surrounding ground surface rather than piling.

Weeds and pathogens – minimise risk by clean/wash-down of equipment to be used on-site and removal of drier mud from footwear.

Operation Mitigation and Management

Vegetation and soil – avoid damage to vegetation by disposing of organic waste in designated facility and using access paths.

Pathogens - minimise risk of spread by removal of mud from footwear and prior to accessing road and walking trail. Provide and maintain chemical footbath at Woodcutters Ecocamp for use at start of the days walk.

4.1.3. Flora Species of Special Conservation Significance

Potential Impacts

The Winder Management Road passes through around 150m of *Eucalyptus* Open Forest where survey confirmed the general presence of Bunya Mountains Bluegrass *Bothriochloa bunyensis*. The species has been recorded from similar habitat 3 km further north. It is likely to also occur in grassy Open Forest close to the scarp edge between these two locations. The Mistake Range is one of the few places where the grass has been found to occur away from the Bunya Mountains where it grows in Woodland and Grassland of the “Balds”. The flowering stems of Bunya Mountains Bluegrass grow off runners or stolons. Cut sections of the runners are likely to be easy to transplant. The area where the grass is growing is relatively steep and rocky and will require resurfacing and drainage works to re-open the road to a useable standard. Consequently any plants found to occur along the route of the old road can potentially be moved for use in regeneration of verges. Tussock (*Poa labillardieri*), a grass growing in the same area is an excellent ground stabiliser and can be transplanted to play a similar role.

Other NCA and EPBC listed plants (see Sections 3.2.3.2 and 3.2.3.3) with a likelihood of occurrence within habitats present in the project area are listed in Table 4.3.

Table 4.3 EVNT taxa with a likelihood of occurrence within or in proximity to proposed activities.

Listed plant species	NC Act Status	EPBC Act Status	Likelihood of Occurrence
<i>Austral Toadflax Thesium australe</i>	V	V	Possible
Bunya Mountains Bluegrass <i>Bothriochloa bunyensis</i>	V	V	Certain
Cliff Orchid <i>Sarcochilus hartmanii</i>	V	V	Possible
Northern Clematis <i>Clematis fawcettii</i>	V	V	Possible
<i>Muellerina myrtifolia</i>	NT	-	Possible

Mitigation and Management

The removal/destruction of individual plants of Bunya Mountains Bluegrass that may be present within the short section of road corridor through known habitat of the species will be avoided. Any plants present are to be identified prior to earthworks, salvaged and re-used post road reconstruction. The identification of plants will need to be conducted during spring-summer when the species is flowering. Plants can be identified with a small marker. The site is close to stored water at Mt Mistake Farmhouse and it is feasible to conduct a heavy post-transplant watering to maximise survival of plants.

Bunya Mountains Bluegrass is also likely to occur along the scarp between the re-opened section of the Winder Management Road, Mt Mistake Farmhouse and new trail along the scarp north from Mt Mistake Farmhouse *en route* to Thornton Trailhead. In these areas the trail is planned to utilise existing tracks (Northern Fire Line and 300 m of private road) and cattle pads along the scarp edge, avoiding any requirement for ground disturbance.

The *Eucalyptus* Open Forest containing Bunya Mountains Bluegrass is periodically burnt on a planned basis and it is important that use of fire to maintain habitat condition is continued. This will check replacement of native grasses and forbs by vines and woody rainforest pioneers. The area is also prone to invasion by habitat modifier weeds especially Crofton Weed *Ageratina adenophora* and Broom Milkwort *Polygala virgata*. Annual monitoring of weeds will be carried out within Bunya Mountains Bluegrass habitat traversed by the Winder Management Road and control measures (e.g. hand-pulling) implemented on an as-required basis in consultation with QPWS.

The recommended procedures for managing vegetation and soil during construction and operation of the trail will mitigate risk of adversely affecting populations of other listed species with a likelihood of occurrence in the project envelope.

Risk Assessment

Table 4.4 provides the results of a qualitative risk assessment process whereby known threats to EPBC Act threatened flora species that are known or likely to be present are assessed against the relevant aspects of the SRT Project. This process has been undertaken to highlight potential impacts and enable a focus on appropriate avoidance, mitigation and management measures where moderate or higher impacts are predicted. This has been an iterative process with the project planning team and the assessment of risks shown in Table 4.4 includes measures required to ensure all potential impacts are “low”.

Table 4.4. Potential impacts¹ of the project on conservation significant species with a likelihood of occurrence within or in proximity to proposed activities.

Risk rating code:

Extreme



High



Moderate



Low



Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
Bunya Mountains Bluegrass <i>Bothriochloa bunyensis</i>	Destruction of a small number of individuals	Small reduction in local population or no net loss.	The re-opening of the Winder Management Road would require removal of shrubs and ground layer species that have become established in the former road corridor since it became unused. An area of 0.05 ha will be disturbed (200 m x 2.5 m). Any Bunya Mountains Bluegrass plants located within the road corridor would be identified prior to ground disturbance and either avoided or salvaged and translocated to the verges of the 200 m long section of the re-built road. Post construction weed monitoring and control measures are included within this Project.	Possible	Insignificant
	Competition from weeds especially along open verges of rebuilt road	Reduction in local population	The habitat of Bunya Mountains Bluegrass in northern Main Range National Park is presently considered to be in good condition based upon observations as part of field surveys associated with this Project, although some weeds are present locally (Appendix 1). A major weed is Crofton Weed which was noted as favouring the moist sunny conditions near the boundary with Rainforest. Broom Milkwort <i>Polygala virgata</i> , a possible recent arrival, was also noted along with ruderal species (Grime 1979) (e.g. short-lived colonisers of bare ground), which come and go with disturbance (e.g. appearing for a period after fire). The road verges would be mulched with converted woody material removed from the roadway to reduce the extent of bare mineral soil prone to weed invasion especially by ruderal species. Post construction weed monitoring and control measures are included within this Project. A strategy to limit risk of weed introductions in the operational phase of the project (e.g. cleaning of footwear) will also be implemented.	Unlikely	Minor

Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
	Altered fire management of the <i>Eucalyptus</i> Open Forest habitat	Change in understorey species composition and abundance (Tran and Wild 2000)	There are no factors associated with the Project which would be likely to influence the prevailing fire management (periodic use of planned fire by QPWS) which maintains the health and integrity of the high altitude basalt <i>Eucalyptus</i> Open Forest/Woodland ecological community in which the species occurs.	Unlikely	Insignificant
Northern Clematis <i>Clematis fawcettii</i>	If present, potential for cutting or removal of individual plants	Loss of small number of plants; resprouting of cut stems	Low probability of occurrence	Possible	Insignificant
Cliff Orchid <i>Sarcochilus hartmannii</i>	Destruction of a small number of individuals	Small reduction in local population.	There is some likelihood that Cliff Orchid could occur locally along parts of the proposed Class 5 trail route on very steep, bouldery slopes >1100m altitude. It was not recorded during reconnaissance of the proposed route. Any potential impacts will be avoided by selecting the placement of the route to avoid any rocks where lithophytic orchids are present.	Unlikely	Minor
	Introduction of weeds	Loss of habitat	The Warm Temperate Rainforest ecological community which occupies the higher ridges and slopes where suitable boulder substrate occurs is currently weed-free. This includes a section that is traversed by a long-used rough walking track similar to a Class 5 trail. The dense shade and cool conditions would inhibit the establishment of many rainforest weeds occurring in southern Queensland. However, temperate adapted weed species are present along the more open conditions of internal roads in the national park which indicate that there is a potential for introductions of species adapted to the cooler climate. Risks along the trail as it is developed are to be minimised by prior wash down/ cleaning of hand-held equipment, footwear etc. A strategy to limit risk of weed introductions in the operational phase of the project will also be implemented.	Unlikely	Insignificant

Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
	Introduction of pathogens	Change in habitat, especially overstorey cover (e.g. due to tree death)	The pathogen Myrtle Rust has not been observed within the Project envelope. However, patches of dead trees were observed in inaccessible parts of the route (e.g. a localised patch of Hoop Pine) which may indicate attack by fungal pathogens. Localised patches of dead trees present along the route will be avoided/detoured as a precautionary measure.	Unlikely	Minor
			Risks along the trail as it is developed are to be minimised by prior wash down/ cleaning of hand-held equipment, footwear etc. A strategy to limit risk of pathogen introductions in the operational phase of the project will also be implemented.	Unlikely	Minor
Austral Toadflax <i>Thesium australe</i>	Inadvertent destruction of a very small number of individuals	Small reduction in local population	There is a small chance that Austral Toadflax could be growing in the same 200 m section of disused roadway as Bunya Mountains Bluegrass. It is not an easy species to detect amongst the grasses where it grows. However, it was not recorded from a 0.1 ha vegetation plot located near the 200 m section of roadway where the Bunya Mountains Bluegrass is likely to occur (Appendix 1). No other suitable habitat of the species is proposed to be disturbed as part of this Project.	Unlikely	Minor
	Competition from weeds	Reduction in local population	The habitat where Austral Toadflax may grow within the Project envelope in Main Range National Park is presently considered to be in good condition based upon observations as part of field surveys associated with this Project, although some weeds are present locally. The most serious weed locally is Crofton Weed which was noted as favouring the moist sunny conditions near the boundary with Rainforest. Broom Milkwort <i>Polygala virgata</i> , a possible recent arrival, was also noted along with ruderal (short-lived colonisers of bare ground) species which come and go with disturbance (e.g. appear for period after fire). The road verges would be mulched with woody material removed from the roadway to reduce the extent of bare mineral soils prone to weed invasion.	Unlikely	Minor

Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
			Post construction weed monitoring and control measures are included within this Project. A strategy to limit risk of weed introductions in the operational phase of the project will also be implemented.		
	Altered fire management of the <i>Eucalyptus</i> Open Forest habitat	Change in understorey species composition	There is no reason to alter the prevailing fire management (periodic use of planned fire by QPWS) which maintains the health and integrity of the high altitude basalt <i>Eucalyptus</i> Open Forest/Woodland ecological community in which the species could occur.	Unlikely	Insignificant

4.1.4. Terrestrial Vertebrate Fauna

Potential Impacts

There are 37 species or subspecies listed as Critically Endangered, Endangered, Vulnerable and Near Threatened under the EPBC Act 1999 and/or the NC Act 1992 known or predicted to occur in Main Range National Park and its immediate environs. Of these, Corben's Long-eared Bat, Australasian Bittern, Australian Painted Snipe, Squatter Pigeon (southern subspecies), Southern Emu-wren, Regent Honeyeater, Painted Honeyeater, Black-throated Finch (southern subspecies), Five-clawed Worm-skink, Condamine Earless Dragon and Dunmall's Snake are not expected to occur in the project area based on known habitat use and distribution. Grey-headed Flying-fox and Swift Parrot are highly mobile species that may occur very occasionally but the project area is not considered to be of any significance to these species. There are two and one WildNet records for these species, respectively. Any possible impacts as a result of the proposed project will, in any case, be addressed under other species. Giant Barred Frog possibly no longer occurs in the project area but is included as any potential impacts are addressed for Fleay's Barred Frog.

Potential impacts as a result of the project, their potential consequences, likelihood and severity are discussed for 24 species in Table 4.5. The likelihood of the impact occurring refers to the actual process. The severity of the impact refers to any effects on the species in question should the impact actually occur. In many instances potential impacts are dramatically reduced by the very narrow (0.6 m), linear nature of the proposed trail with minor potential for habitat fragmentation, and the fact that a significant proportion of the trail (such as the Mt Mitchell section that traverses historical Eastern Bristlebird habitat) is already in use.

Mitigation and Management

Construction contractors will prepare Construction Environmental Management Plans (CEMPs) specific to their tasks. These CEMPs will include the commitments for environmental protection set out in this report.

Gainsdale Pty Ltd will prepare a Fauna Management Plan for the operational phase of the project, which will incorporate the following:

- A requirement to record all sightings and signs of species of special conservation significance to be kept in a single database for annual reporting.
- Preparation and implementation of a Feral Animal Management Plan. This will include monitoring and control actions to reduce numbers of feral Pigs, European Foxes, feral Dogs and Cane Toads in and around the Scenic Rim Trail and associated infrastructure. The Feral Animal Management Plan will include a requirement to consult and cooperate with QPWS, local governments and surrounding landholders to ensure that relevant monitoring information is passed on and received and that control measures are coordinated. Ecoguides will be continuously present along the Scenic Rim Trail and will be trained to recognise the signs and effects of feral animal presence, and will report all instances (including species and GPS location) as monitoring records, and for management action where necessary.
- Gainsdale Pty Ltd will consult with QPWS regarding appropriate Chytrid fungus hygiene protocols for bushwalkers and for frog surveys and the agreed protocols will be included in the Fauna Management Plan.
- Gainsdale Pty Ltd will develop educational material for guests and training programs for ecoguides and scientists regarding the required Chytrid fungus hygiene protocols.
- Gainsdale Pty Ltd will facilitate baseline surveys of key species that are known or have potential to occur (e.g. Hastings River Mouse, Fleay's Barred Frog, Eastern Bristlebird, Mt Mistake Spiny Cray), comprising annual surveys for the first three years of construction/operation, reporting to QPWS, and subsequent review to establish appropriate monitoring intervals.

Any disturbance to fauna habitat under the guidance of a DEHP approved Species Management Program to manage animals breeding places. This includes low-impact activities such as brush cutting ground cover for the Class 5 trail.

Risk Assessment

Table 4.5 provides the results of a qualitative risk assessment process whereby known threats to EPBC Act threatened fauna species that are known or likely to be present are assessed against the relevant aspects of the SRT Project. This process has been undertaken to highlight potential impacts and enable a focus on appropriate avoidance, mitigation and management measures where moderate or higher impacts are predicted. This has been an iterative process with the project planning team and the assessment of risks shown in Table 4.5 includes measures required to ensure all potential impacts are “low”.

Planning and constructing the stream crossing locations to avoid hydraulic and water quality impacts on streams and avoid impacts on frog habitat will be required. Monitoring of stream condition, threatened frogs and Mt Mistake Spiny Cray at locations where the trail crosses watercourses is proposed annually for the first three years reporting to QPWS, then reviewed to establish appropriate ongoing monitoring interval.

While the Hastings River Mouse habitat adjacent to the proposed Woodcutters Ecocamp site represents the edge of a significant area of likely habitat for the species, shielding the upslope habitat from night time activities that generate noise and light at the Woodcutters Ecocamp will be required to minimise impacts. Baseline survey and ongoing monitoring of the species and habitat is proposed.

There are historical Eastern Bristlebird records (>20 years old) from the area around Cunningham’s Gap and southward, including from around the proposed Mt Mitchell Trail section (Figure 3.1). Baseline population assessment, habitat condition and long term monitoring for calls within habitat adjacent to the trail are proposed. Should the species be found to be present now, or found to recolonise suitable habitat in the future, active management is required to assess potential impacts of SRT and general public use of the existing tracks and trails in cooperation with QPWS.

The monitoring and management of feral animals, including feral predators will be important. Feral Pigs were noted throughout the project area, although more concentrated activity was recorded in the northern section. Feral Pigs can have a significant impact on habitat quality for a number of species and while the project would not particularly facilitate greater numbers, it can have an important role in monitoring and managing Feral Pig numbers to reduce current levels of impact.

Educational material reaffirmed with presentation/discussion of the potential impacts of fire will be provided to guests and the general public. Open fires will not be allowed in the overnight nodes.

Monitoring of feral animal activity and vegetation health along the route and surrounding the overnight nodes will be continuous via the ecoguides, and management responses will be adaptive according to needs.

Table 4.5. Potential impacts¹ of the project on conservation significant terrestrial vertebrate fauna species known or considered likely to occur in Main Range National Park and its immediate environs

Risk rating code: Extreme  High  Moderate  Low 

Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
Spotted-tailed Quoll <i>Dasyurus maculatus maculatus</i>	Increased access for feral predators.	Increased predation. Increased competition for prey.	Tracks increase access for feral Dog <i>Canis lupus familiaris</i> , Cat <i>Felis catus</i> and Red Fox <i>Vulpes vulpes</i> . These species already occur in the national park, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. A Feral Animal Management Plan will be implemented which is expected to have a net positive impact.	Unlikely	Minor
	Increased access for Cane Toads.	Poisoning, potentially fatally, by attempted ingestion.	Tracks facilitate the spread of Cane Toads. Cane Toad is already present in the national park, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. Cane Toads may be a threat (Burnett & Meyer-Gleaves 2012), though this is uncertain (Woinarski <i>et al.</i> 2014).	Unlikely	Insignificant
	Altered fire regime.	Reduced number of refuge sites. Reduced prey abundance.	Human activity potentially increases the likelihood of accidental fire. The likelihood of accidental fires started by walkers/campers is considered very low. Access to the public trails as part of the Project is limited to supervised walkers sleeping in custom built lodgings. No detectable increase in fire risk is expected.	Unlikely	Minor
Koala <i>Phascolarctos cinereus</i>	Increased access for feral predators.	Predation.	Tracks increase access for feral Dog. The species is already present in the national park, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. Koalas are present in the more open areas. A Feral Animal Management Plan will be implemented which is expected to have a net positive impact.	Unlikely	Minor

Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
Greater Glider <i>Petauroides volans</i>	Altered fire regime.	Loss of hollow-bearing trees for shelter. Loss of food trees.	Greater Glider is most abundant in forests that are infrequently burnt. Human activity potentially increases the likelihood of accidental fire. Access to the public trails as part of the Project is limited to supervised walkers sleeping in custom built lodgings. No detectable increase in fire risk is expected.	Unlikely	Minor
	Fragmentation of habitat.	Decreased dispersal.	Greater Gliders disperse poorly across non-native vegetation. The 0.6 m unformed trail would be insufficient to act as a barrier to movement.	Unlikely	Insignificant
	Introduction or spread of <i>Phytophthora</i> root fungus.	Loss of food trees.	Affects the health of eucalypts. Causes dieback. Construction mitigation measures and operation procedures will minimise any likelihood.	Unlikely	Minor
Long-nosed Potoroo <i>Potorous tridactylus tridactylus</i>	Increased access for feral predators.	Predation.	Tracks increase access for Cat and Red Fox. These species already occur in the national park, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. A Feral Animal Management Plan will be implemented, which is expected to have a net positive impact.	Unlikely	Minor
Brush-tailed Rock-wallaby <i>Petrogale penicillata</i>	Increased access for feral predators.	Predation.	Predation by Red Fox. Predation by feral Dog (low risk due to lack of agility). Juveniles are possibly subject to predation by Cats. These predators are already present in the national park and there is an existing road to the location on the proposed trail route where Rock-wallabies have been sighted previously. Furthermore, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. A Feral Animal Management Plan will be implemented, which is expected to have a net positive impact.	Unlikely	Minor
	Increased access for feral herbivores.	Competition for food. Loss of food species.	Feral herbivores, e.g. Pigs and deer species, compete with native herbivores, spread weed species and disturb waterbodies. These species are already present in the park, and feral pigs are particularly abundant in the northern section of the project area. A Feral Animal Management Plan will be implemented, which is expected to have a net positive impact.	Unlikely	Minor

Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
	Weed invasion.	Loss of food species due to replacement.	Pest plants are most likely to become established in areas that are disturbed through grazing by feral animals, track construction or fire. Invasion by Lantana alters habitat structure and reduces habitat quality. A weed management plan will be implemented with a focus on monitoring and removing weeds at the entry points.	Unlikely	Minor
	Introduction or spread of pathogens.	Reduced fitness.	Possibly susceptible to toxoplasmosis and hydatidosis infection, carried by Cats. Cats are already present in the park.	Unlikely	Minor
	Fragmentation of habitat.	Decreased dispersal.	The 0.6 m trail is insufficient to act as a barrier to movement. Improved foraging opportunities, albeit limited, may be created at Ecocamps. Any disruption to the natural process of low level gene flow resulting from recent human induced change would be in no way assisted by the Project.	Unlikely	Insignificant
Large-eared Pied Bat <i>Chalinolobus dwyeri</i>	Increased access for feral herbivores.	Reduced breeding success.	Maternity sites are subject to disturbance by feral Goat <i>Capra hircus</i> . Goat is not known to occur in the park. No maternity site for <i>C. dwyeri</i> is known in the national park.	Very unlikely	Insignificant
	Disturbance by humans in maternity caves.	Reduced breeding success.	No maternity site is known in the national park.	Very unlikely	Insignificant
New Holland Mouse <i>Pseudomys novaehollandiae</i> Hastings River Mouse <i>P. oralis</i>	Increased access for feral predators.	Predation.	Tracks increase access for feral Dog, Cat and Red Fox. These predators are already present in the national park, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. Removal of regrowth along the existing road and creation of a trail, albeit with minimal vegetation disturbance, will facilitate movement to a minor extent. A Feral Animal Management Plan will be implemented, which is expected to have a net positive impact.	Unlikely	Minor
	Noise and lighting disturbance at Woodcutters Ecocamp	Reduced occupancy of habitat	Noise and lighting disturbance may affect a very small area of known habitat for Hastings River Mouse. Design of the Ecocamp is to focus common areas away from this habitat, with the location of the sleeping cabins shielding the habitat from the low levels of intermittent light and noise that would be generated.	Possible	Insignificant

Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
	Weed invasion.	Replacement of food species.	Pest plants are most likely to become established in areas that are disturbed through grazing by feral animals, track construction or fire. A weed management plan will be implemented with a focus on monitoring and removing weeds at the entry points and controlling weeds at Ecocamp locations.	Unlikely	Minor
	Altered fire regime.	Loss of habitat.	Lack of habitat patches of suitable successional age. Human activity potentially increases the likelihood of accidental fire. The likelihood of accidental fires started by walkers/campers is considered very low. Access to the public trails as part of the Project is limited to supervised walkers sleeping in custom built lodgings. No detectable increase in fire risk is expected.	Unlikely	Minor
	Introduction or spread of <i>Phytophthora</i> root fungus.		Affects the health of eucalypts. Causes dieback. Construction mitigation measures and operation procedures will minimise any likelihood.	Unlikely	Minor
Red Goshawk <i>Erythrotriorchis radiatus</i>	Disturbance at nest by birdwatchers.	Reduced breeding success.	Main Range NP is the centre of a recognised territory historically but the likelihood of an active nest visible from the proposed trail is very low, particularly since the species may no longer breed in South East Queensland. Eco-guides will be aware of such a possibility.	Very unlikely	Insignificant
	Egg-collecting.	Failed breeding.	There is expected to be no increased risk of egg-collecting resulting from the Project. Ecoguides will be instructed to prevent any egg-collecting.	Very unlikely	Insignificant
	Increase in fire frequency.	Reduced number of potential breeding sites. Reduced prey abundance.	Human activity potentially increases the likelihood of accidental fire. Access to the public trails as part of the Project is limited to supervised walkers sleeping in custom built lodgings. No detectable increase in fire risk is expected.	Unlikely	Minor
Black-breasted Button-quail <i>Turnix melanogaster</i>	Increased access for feral herbivores.	Reduced food abundance.	Grazing and trampling may degrade habitat. There is no mention of a Main Range population in the national recovery plan. The closest identified population is at Mount French, c. 20 km to the east.	Unlikely	Insignificant
	Increase in fire frequency.	Reduced food abundance. Habitat loss.	Too frequent burning of leaf litter. Human activity potentially increases the likelihood of accidental fire. The closest identified population is at Mount French, c. 20 km to the east. Access to the public trails as part of the Project is limited to supervised walkers sleeping in custom built lodgings. No detectable increase in fire risk is expected.	Unlikely	Insignificant

Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
	Increased access for feral predators.	Predation.	Ground-nesting bird. Tracks increase access for Cat, Red Fox and feral Pig <i>Sus scrofa</i> . These species are already present in the park, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. A Feral Animal Management Plan will be implemented, which is expected to have a net positive impact. Closest identified population of Black-breasted Button-quail is at Mt. French, c. 20 km to the east.	Possible	Insignificant
Swift Parrot <i>Lathamus discolor</i>	Increased access for feral predators.	Predation.	Occasionally predated by Cats, though the impact is low. Tracks increase access for Cats, though the species is already present in the park. A Feral Animal Management Plan will be implemented.	Very unlikely	Insignificant
	Collisions with windows.	Death.	This is recognised as a threat in the breeding season, when the species is in Tasmania. Collision with windows in the eco-camps is a very remote possibility.	Very unlikely	Insignificant
	Increased competition with aggressive and invasive native species due to habitat fragmentation.	Reduced foraging.	Noisy Miner <i>Manorina melanocephala</i> , Bell Miner <i>M. melanophrys</i> and Red Wattlebird <i>Anthochaera carunculata</i> are all present and common in the National Park. The nature and extent of the proposal should not cause an increase in these species.	Very unlikely	Insignificant
Coxen's Fig-parrot <i>Cyclopsitta diophthalma coxeni</i>	Weed invasion.	Degradation of habitat.	A weed management plan will be implemented with a focus on monitoring and removing weeds at the entry points.	Unlikely	Insignificant
	Loss of isolated fig trees.	Reduced food resources.	The construction phase will not include the loss of any such trees.	Very unlikely	Insignificant
	Egg and chick collecting.	Reduced or failed breeding success.	Nest site surveys detected evidence of breeding activity in only 11 instances. The likelihood of a nest visible from the proposed trail is very low.	Very unlikely	Insignificant
Rufous Scrub-bird <i>Atrichornis rufescens</i>	Increase in fire intensity (Garnett <i>et al.</i> 2011).	Loss or degradation of habitat.	The Project is not expected to increase fire intensity in any way. Fire may also restore habitat suitability as ground cover declines with habitat maturation.	Unlikely	Insignificant

Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
Eastern Bristlebird <i>Dasyornis brachypterus</i>	Altered fire regimes.	Loss or degradation of habitat. Mortality due to poor mobility.	Intense and/or extensive fires can remove suitable habitat. Frequent fires may prevent vegetation from becoming sufficiently dense for the species. Infrequent fires can allow vegetation to become too dense to be inhabited. Human activity potentially increases the likelihood of accidental fire. The likelihood of accidental fires started by walkers/campers is considered very low. Access to the public trails as part of the Project is limited to supervised walkers sleeping in custom built lodgings. No detectable increase in fire risk is expected.	Unlikely	Minor
	Increased access for feral herbivores.	Degradation of habitat.	Feral Pigs degrade habitat. This species is already present in the park, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. A Feral Animal Management Plan will be implemented, which is expected to have a net positive impact.	Unlikely	Insignificant
	Increased access for feral predators.	Predation.	Predation by Cat and Red Fox. These predators are already present in the national park, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. A Feral Animal Management Plan will be implemented, which is expected to have a net positive impact.	Very unlikely	Minor
	Weed invasion.	Degradation of habitat.	Lantana reduces habitat suitability. A weed management plan will be implemented with a focus on monitoring and removing weeds at the entry points.	Unlikely	Minor
	Introduction or spread of <i>Phytophthora</i> root fungus.	Degradation of habitat.	Construction mitigation measures and operation procedures will minimise any likelihood.	Unlikely	Minor
	Disturbance by humans.	Reduced or failed breeding success.	The presence of humans can result in nest abandonment. No known Eastern Bristlebird population occurs in proximity to the proposed trails other than a portion of the Mt Mitchell trail. In this portion there are no recent records. There are historical records (over 20 years old) in close proximity to the proposed trail in this area, and the habitat is thought to be abandoned following a fire event. The trail is this section	Unlikely	Minor

Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
			follows existing tracks that are currently in use and no further possible disturbance is predicted from small, guided walking parties along these existing tracks.		
Collared Delma <i>Delma torquata</i>	Removal or fallen timber and rocks.	Loss of shelter sites.	There is no database record of these species and the likelihood of its occurrence is unknown. There will be minimal disturbance to fallen timber and rocks as a result of the proposed trail and Ecocamps.	Very unlikely	Minor
	Increased access for feral predators.	Predation.	Predation by Cat and Red Fox. These species are already present in the park, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. Collared Delma occurs in open habitats. A Feral Animal Management Plan will be implemented, which is expected to have a net positive impact.	Very unlikely	Minor
	Altered fire regimes.	Loss or degradation of habitat. Mortality due to poor mobility.	Threat is uncertain. Human activity potentially increases the likelihood of accidental fire. The likelihood of accidental fires started by walkers/campers is considered very low. Access to the public trails as part of the Project is limited to supervised walkers sleeping in custom built lodgings. No detectable increase in fire risk is expected.	Very unlikely	Minor
	Weed invasion.	Degradation of habitat.	Lantana reduces habitat suitability. A weed management plan will be implemented with a focus on monitoring and removing weeds at the entry points.	Unlikely	Minor
Three-toed Snake-tooth Skink <i>Coeranoscincus reticulatus</i>	Increase in fire frequency.	Loss of shelter and foraging habitat.	Loss of fallen logs and leaf litter. Human activity potentially increases the likelihood of accidental fire.. Fire penetration is only likely during very dry conditions. Access to the public trails as part of the Project is limited to supervised walkers sleeping in custom built lodgings. No detectable increase in fire risk is expected.	Very unlikely	Minor
	Increased access for feral herbivores.	Degradation of habitat.	Feral Pigs degrade habitat. The species is already present in the park, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. A Feral Animal Management Plan will be implemented, which is expected to have a net positive impact.	Unlikely	Minor

Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
	Increased access for feral predators.	Predation.	Cat and Red Fox are known to kill skinks. These predators are already present in the national park, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. A Feral Animal Management Plan will be implemented, which is expected to have a net positive impact.	Unlikely	Minor
Fleay's Barred Frog <i>Mixophyes fleayi</i>	Spread of pathogens.	Reduced population.	Chytridiomycosis affects this species. The fungus is widespread in the park. Humans are not the only vectors. Operation procedures such as footbaths will minimise any likelihood.	Unlikely	Minor
	Increased access for feral Pigs.	Degradation of habitat through siltation. Predation.	Feral Pigs degrade habitat. The species is already present in the park, the hiking trail will follow existing trails for a large portion of the route and sections of new trail typically follow existing animal tracks along sections that follow the contour on the escarpment rim, meaning that the potential for increased access is minor. A Feral Animal Management Plan will be implemented, which is expected to have a net positive impact.	Unlikely	Minor
	Habitat disturbance at stream crossing	Degradation of habitat through trampling and siltation	Construction involving a walkway or stepping stones at a stream crossing has the potential to degrade habitat and human access to pools may degrade habitat. The crossing point will be selected to ensure there are no nearby pools potentially suitable as swimming holes and limited potential for soil erosion causing siltation. Crossing design and construction undertaken in consultation with QPWS will ensure there is no disturbance to the stream riffle zone and adjacent moist banks, and no soil disturbance that might result in sediment runoff.	Unlikely	Minor
	Weed invasion.	Degradation of habitat.	Mistflower <i>Ageratina riparia</i> and Crofton Weed <i>A. adenophora</i> reduce habitat suitability. A weed management plan will be implemented with a focus on monitoring and removing weeds at the entry points.	Unlikely	Minor

1. Potential impacts are taken from the *Species Profile and Threats Database* (DoE 2016d) unless otherwise referenced.

4.1.5. Aquatic Environment

Potential Impacts

The Mt Mistake Spiny Cray *Euastacus jagara* is threatened by fire, collecting, changes to hydrology, and habitat loss. Cane Toads are considered a potential threat and other *Euastacus* species are vulnerable to feral predators. The species is highly vulnerable to climate change, an increase in temperature could eradicate the species (Coughran & Furse 2010b).

The low impact Class 5 Trail will not alter hydrological regimes or affect water quality in habitat where this species may be present. During operation, it is possible that the trail would enable those wanting to collect the species for aquarium purposes may have improved access to their habitat. A response to the presence of the species during baseline survey may be to relocate the track further from known habitat.

Mitigation and Management

It is proposed to monitor stream condition in the few locations where the trail meets watercourses. While a comprehensive monitoring program at these locations is intended to be implemented annually, the ecoguides will provide weekly feedback on the condition of these locations and will immediately report any need for maintenance should it be required.

If baseline surveys indicate that the Mt Mistake Spiny Cray may be present at or near any of the locations where the trail meets watercourses, annual monitoring for this species and the condition of its habitat would be implemented.

Risk Assessment

Table 4.6 provides a risk assessment for potential project impacts on aquatic fauna species of conservation significance.

Considered to be 'moderate' risks for the Mt Mistake Spiny Cray are:

- Altered hydrological processes and sedimentation
- Illegal collection
- Altered fire regime.

Cane Toads are considered to represent a 'low' risk to the species.

The risk assessment process allows for identification and targeting of additional planning, management, monitoring and education measures for the project.

In particular, the monitoring and management of track condition and erosion/sedimentation is important.

Educational material reaffirmed with presentation/discussion of the potential impacts of fire and illegal species collection will be provided to guests and the general public. Open fires will not be allowed in the overnight nodes.

Cane Toads may already be present, and a baseline and ongoing monitoring program with corresponding management measures will be necessary.

Table 4.6. Potential impacts of the project on conservation significant aquatic species known or considered likely to occur in Main Range National Park and its immediate environs

Risk rating code: Extreme  High  Moderate  Low 

Species	Potential Impact	Potential consequences	Comments	Likelihood of the impact occurring	Expected severity of the impact
Mt Mistake Spiny Cray <i>Euastacus jagara</i> (IUCN Red List Critically Endangered)	Altered hydrological processes and sedimentation.	Degradation of habitat.	Changes to local hydrology will minimized through mitigation and management measures.	Unlikely	Minor
	Illegal collection.	Reduced population.		Unlikely	Minor
	Altered fire regime.	Degradation of habitat.	Human activity potentially increases the likelihood of accidental fire. The likelihood of accidental fires started by walkers/campers is considered very low. Penetration of fire into suitable habitat would occur only under very dry conditions.	Very unlikely	Minor
	Increased access for Cane Toads.	Predation.	Cane Toads are known to be a threat at the genus level but their threat for <i>E. jagara</i> is unknown.	Unlikely	Minor

4.2. RESIDUAL BIODIVERSITY IMPACTS

4.2.1. Flora

The residual impacts associated with the road, trails and accommodation nodes are likely to be limited. The major post-construction impact is identified as weed growth. Road re-construction aims to restrict vegetation disturbance within the existing corridor which leaves a fringe of regrowth species. The shaded canopy cover above the road remains unaffected limiting establishment of weeds. There is potential for colonisation of weeds on bare ground created by the road in the sunny Open Forest – Rainforest ecotone in the extreme north of the road where several weed species are present. A recommendation for co-operation between Scenic Rim Trail and QPWS would remove an infestation of Broom Milkwort *Polygala virgata* in this area which appears to be a recent arrival.

The limited proposed disturbance of soil and rock along the trail is within remote places which are presently weed free, and the requirement for cleaning of footwear and equipment aims to minimise risk of introductions. The cool shaded conditions prevailing at these sites are also likely to inhibit the weed species able to establish.

The disturbance at the Amphitheatre View Wilderness Ecocamp carries a risk of maintaining small patches of bare ground suited to ruderal weeds especially daisies.

4.2.2. Terrestrial Vertebrate Fauna

Management protocols, especially in response to information from ecoguides on weed establishment, presence of feral herbivores and predators, presence of Cane Toads, locations of deteriorating track condition and any nesting close to the trail or Ecocamps by species such as Glossy Black-Cockatoo and Red Goshawk will significantly reduce most residual impacts. Ecoguides ensuring appropriate behaviour by walkers will also minimise or, more likely, completely remove any likelihood of unplanned fires. The disturbance of fauna through the presence of walkers is an unavoidable and on-going impact, though education of walkers about appropriate behaviour and the immediate advice of ecoguides will minimise any disturbance. Any sensitivity to walkers by resident fauna will lessen over time or any particularly sensitive species will move from the disturbance corridor. Species such as the Endangered Rufous Scrub-bird continue to maintain territories immediately adjacent to long established tracks in parks such as Lamington National Park, with birds moving across tracks within their territory.

There are historical records of Eastern Bristlebird south of Cunninghams Gap that are close to the trail route. However; the species has not been recorded from this area for over 20 years following a fire event. Field assessment indicates that the habitat appears to be suitable for the species. While the proposed SRT route follows existing well-used trails and tracks through this habitat, it is proposed to conduct long-term monitoring for the species through the deployment of song meters, and to regularly survey the structure and condition of habitat in the vicinity of the trail. There are opportunities to link these surveys to research planned by the Hidden Vale UQ Wildlife Centre, supported by Gainsfield Pty Ltd, with potential for captive breeding and reintroduction of the species into suitable habitat at Mt Mitchell.

Planning and constructing the stream crossing locations to avoid hydraulic and water quality impacts on streams and avoid impacts on frog habitat will be required to prevent impacts on Fleay's Barred Frog and Mountain Frog. The crossing location, approach and type should be designed in consultation with QPWS frog expert/s.

While the Hastings River Mouse habitat adjacent to the proposed Woodcutters Ecocamp site represents the edge of a significant area of likely habitat for the species, shielding the upslope habitat from night time activities that generate noise and light at the Woodcutters Ecocamp will be required to minimise impacts.

There will remain a possibility that walkers may spread pathogens such as Chytrid fungus but the fungus is already widespread in the park and humans are not the only vector for transmission. The hygiene protocols and walker education programs (Section 4.2.1.1) will minimise the likelihood of any spread. Cane Toads spread through areas of disturbance and the most likely residual impact with regard to this species would be its invasion into an area supporting Common Death Adder. It will be important to ensure that breeding sites are not created around eco-camps. The most significant of any possible impact will be the potential spread of feral predators along the trails. Trails provide opportunities for easy movement and hunting for feral predators, although the proposed trail follows existing roads, tracks, informal footpads and animal tracks and the opportunity for feral animal access is unlikely to be enhanced by the project. Species most at risk from feral animals are ground-dwelling mammals, especially Brush-tailed Rock-wallaby, though Three-toed Snake-tooth Skink and Common Death Adder will also be susceptible. The feedback from ecoguides regarding any sign of use, typically tracks and scats, will be important to aid in implementation of the park's pest species management plan. Ongoing monitoring for feral predators, including through use of infra-red cameras along track sections and at the Ecocamps, and management responses to the detection of feral predators set out clearly in a Feral Animal Management Plan, will mitigate potential impacts on native species and may work to decrease existing feral animal numbers in the project area. Development of the Feral Animal Management Plan should be in consultation with QPWS.

4.2.3. Aquatic Environment

Due to the location and low impact of the proposed trail and overnight nodes, and with the implementation of construction and operation environmental management plans, it is unlikely that there will be significant residual impacts on the aquatic environment.

4.3. GEOMORPHOLOGY AND GEOLOGICAL HISTORY

Major features of geological significance include the actively retreating eastern escarpment, the outcropping basalt at Bare Rock and the deeply incised west-flowing streams. The side tributaries in the headwaters of the major streams form ephemeral waterfalls after heavy rainfall events. These features can be viewed from parts of the route and an existing path free of vegetation crosses Bare Rock. There will be no detrimental effects to geological features along any part of the route.

4.4. VISUAL IMPACT

As the Scenic Rim Trail involves the use of existing infrastructure and tracks/roads, this discussion relates only to new infrastructure and trails.

The discussion is based upon the finished construction project once minor rehabilitation work has been undertaken after the construction process. The construction process is discussed in other sections but involves minimal disturbance principles and the use of solely local endemic species in any rehabilitation of sites used.

4.4.1. Visual Impact of the Trail on Main Range National Park

The Scenic Rim Trail will create negligible visual impact due to several factors:

- as a Class 5 walking trail the track width would be no more than 600 mm wide and will not involve the removal of trees
- where the trail follows existing tracks and trails there is no widening of original road works to be undertaken
- the trail is under forest canopy for the majority of its alignment, all new sections of trail are under forest canopy, and
- the trail is not visible from any existing lookout.

4.4.2. Visual Impact of the Overnight Nodes on Main Range National Park

Four new Ecocamps will be constructed, two on National Park and two on private land. One, Mt Mistake Farmhouse involves the re-purposing of a large farmhouse, and is therefore quite different to the design approach undertaken at the other three sites.

Mt Mistake Farmhouse

The Mt Mistake Farmhouse is a large semi-modern farmhouse that was built around the 1980's. The house is located far enough from the escarpment not to be visible from the valley below. The Ecocamp is in a large clearing that forms part of the farm. The new item of infrastructure is the Sunrise Viewing Deck. While close to the edge of the escarpment the deck is some metres back from the edge and therefore will not be visible from the valley below.

Amphitheatre View Wilderness Ecocamp

This site is on the southern flank of the ridgeline and will not be visible from any vantage point. Buildings will be located under the trees. The proposed Amphitheatre View lookout deck overlooks the very steep drop-off, but is set back from the edge. It may be partially visible if viewed from the corresponding ridge several hundred metres to the north. However there are no walking tracks in that area and the lookout deck will be of a small scale and constructed in natural material in natural colour tones. The Ecocamp will be visible from the western management road, however this road is behind a locked gate. Walkers using the road would only sight the Ecocamp as they approach it.

Woodcutters Ecocamp

This Ecocamp is located along the Cascades Trail. Walkers, mainly more adventurous campers at the nearby QPWS Manna Gum and Poplar Flat camping areas at Goomburra and campers at Gordon Country sites, use this track. The Ecocamp will be visible from the existing track and a 250 m long deviation is proposed which would enable the facility to remain unseen by Cascades Trail hikers.; The Ecocamp will be finished in low reflectivity natural colours and will be unobtrusive. The Ecocamp is located on a north-east facing slope and would not be visible from any ground-based vantage point other than the adjoining Cascades Circuit.

Canopy Ecocamp

Located within the Spicers Nature Refuge, this site is largely cleared. The site is visible from a number of very remote vantage points however the buildings are very low key, small scale and finished in natural colour tonings. The building will be seen in the context of them being part of a grazing property, along with water tanks, windmills and farm buildings.

4.5. HISTORIC AND CULTURAL HERITAGE

4.5.1. Assessment of Impact

The route does not intersect any places contained on statutory heritage lists. However, infrastructure and artefacts associated with the area's logging history are situated along or close to the route (the site of a former log chute used for conveying logs to the base of the scarp and the remains of "The Winder") and there is also a probability that pieces of machinery and other logging era relics occur in the vicinity of the route in places. Historical survey markers have also been observed along the trail.

4.5.2. Mitigation

During construction, the priority option for Aboriginal or other historical artefacts identified from within the corridor is to re-route the trail to avoid the site. Artefacts are not to be removed or interfered with during construction and operation of trails. Visiting historical features (e.g. the log chute) should be avoided in the absence of detailed site assessment and trail access.

4.6. WASTE AND HAZARDOUS MATERIALS

4.6.1. Fuels and Dangerous Substances

All construction activities will be undertaken in compliance with approved Construction Environmental Management Plans that will detail the required treatment of hazardous substances to protect the environment.

During operations, all accommodation locations will have separate storage structures for flammable liquids and other hazardous substances. Chemicals for weed treatment will be managed by specialist contractors and will not be stored on site.

4.6.2. Water and Liquid Waste

Subject to full engineering assessment and approval processes the following are intended for the two ecocamps on National Park - Amphitheatre View Wilderness and Woodcutters Ecocamps.

Rainwater collection

- Site population: 10 guests and 2 guides.
- Daily water usage: 10 litres/person/shower, 5 litres/person/meals, 6 litres/person/wc (2 x 3 litre flushes), 3 litres/personal water refill.
- Total daily water usage: 24 litres/person.
- Total Camp daily water usage: 288 litres (assuming 100% occupancy).
- Total annual water usage (based on 154 overnight stays per year): 44,352 litres.

Install 3 x 10,000 litre (corrugated iron) storage tanks with 1 x 1,000 litre elevated day tank filled via a solar powered pump. An activated carbon filter installed on the water supply.

In this location 100 - 120 square metres of roof area will be able to capture this volume of rainwater.

In addition install a 20,000 litre reserve fire (corrugated iron) tank (for supplying a portable fire unit Mted on a 4WD).

Hot water would be solar with a gas backup.

Black water, grey water and toilet facilities

Two 4000 L plastic sealed septic tanks will be installed. One primary tank and one as an overflow tank (in the event of a prolonged period of wet water which precludes tanker access). The primary tank will be pumped out when approaching capacity, leaving the second tank as a purely emergency back-up. The tanks would collect both grey and black water. The tanks will be pumped out via a pipe that the tanker connects to (with an on-board vacuum pump). Toilets will be ultra low flush units (2 litre flush).

As such there is no proposal to release any waste water from the Ecocamp sites and no impacts from waste water are predicted.

4.7. LAND USE

During the construction phase, shared access roads and tracks will need to be utilised by vehicles and personnel. The increased road and foot traffic may inconvenience hikers for short periods. The proposed work will be carried out within areas inaccessible to or rarely traversed by the public. However, construction site signage may be appropriate at entry points.

The Scenic Rim Trail is likely to bring additional back country hiking north of Cunningham's Gap due to increased awareness of the route. The impacts of increased usage (e.g. camp pads, waste disposal) will require monitoring and an annual assessment of the condition of the route is proposed.

4.8. HEALTH AND SAFETY

4.8.1. Fire Management

The *Eucalyptus* Open Forests are burnt on a planned basis to maintain understorey diversity and promote regeneration of trees. Planned burns are likely to be undertaken periodically by QPWS in the northern part of the route and in the vicinity of Amphitheatre View Wilderness Camp. The timing of burns should coincide with periods when the trails are not in use. Smoke from nearby fires may also cover the route at times, and there is a risk of wildfires during warm dry weather, particularly from the west. Consequently liaison between Scenic Rim Trail, QPWS and local fire wardens will be required during the annual fire season to monitor conditions and fire events.

Fire rarely enters rainforest except under extremely hot dry conditions when there has been heavy defoliation of trees. The rainforest which accounts for most vegetation along trails can be regarded as a shelter from fire under most conditions. However, use of trails is not recommended during periods of extreme fire weather which occurs infrequently during late spring and early summer.

Risk assessment and mitigation for elements of the Scenic Rim Trail project are addressed in the following sections.

4.8.1.1. The Trail

Thornton to Mt Mistake Rainforest

Grassy *Eucalyptus* Woodland and Open Forest occurs along most of this section and as such is susceptible to fire events. As it is at the start of the trail, walkers are likely to be forewarned of fire events. Under extreme and catastrophic ratings the trail would be closed. A fire rating sign will be installed at the Trailhead entry.

Mt Mistake Closed Forest to Amphitheatre View Wilderness Ecocamp

This section is walking almost entirely in a low fire risk closed canopy except for the very short sections of trail to the east of the Amphitheatre View Wilderness Ecocamp (approximately 200 m). In the event of a wildfire guides would either:

- call in ATVs using the management track to evacuate guests to the closest exit, or
- walk them out to the nearest safe exit, or
- take refuge deep within a rainforest gully preferably where water is available.

Amphitheatre View Wilderness Ecocamp to Woodcutters Ecocamp

This section is walking almost entirely in a low fire risk closed canopy except for the very short sections of trail east of the Amphitheatre View Wilderness Ecocamp (approximately 200 m). In the event of a wildfire guides would either:

- call in ATVs using the management track to evacuate guests to the closest exit, or
- walk them out to the nearest safe exit, or
- take refuge deep within a rainforest gully preferably where water is available.

Woodcutters Ecocamp to Mt Cordeaux

This section is walking almost entirely in a low fire risk closed canopy except for the very short sections between Bare Rock and Mount Cordeaux (approximately 400 m) and the walk down from Mt Cordeaux to Cunningham's Gap. In the event of a wildfire guides would either:

- walk guests out to the nearest safe exit, or
- ensure guests take refuge deep within a rainforest gully preferably where water is available.

Cunningham's Gap to Canopy Ecocamp

This section uses formal National Park walking track and a short link track to the Spicers Peak Nature Refuge. In the event of a wildfire guides would either:

- walk guests out to the nearest safe exit, or
- ensure guests take refuge deep within a rainforest gully preferably where water is available.

4.8.1.2. Ecocamps

Mt Mistake Farmhouse

This Ecocamp also has two 4WD/ATV routes that could provide for escape should a wildfire threaten the Mt Mistake area:

- The northern access road and easement from Thornton Nature Refuge
- The Winder Management Road and Winder Trail to Lookout Road along the re-opened road alignment.

Helicopter evacuation will be conducted from the helipad or numerous other cleared paddocks in the vicinity of the Ecocamp if weather circumstances permit.

All construction and operational staff will be trained in the fire evacuation procedures, operation of fire equipment and prevention policies and communication protocols in the event of a fire.

Amphitheatre View Wilderness Ecocamp

This Ecocamp also has three 4WD/ATV routes that could provide for escape should a wildfire threaten the Goomburra area:

- Mt Castle West Fire Line back east to The Lookout Road and descending to the Forestry Reserve Road
- Mt Castle West Fire Line to the west descending to the North Branch Creek on private land
- The Winder Management Road to Mt Mistake along the re-opened road alignment.

Additionally escape by foot into the rainforest gully to the northwest (part of the new Winder Trail diversion) provides protection through deep, steep sided rainforest gully and semi-permanent water.

Weather permitting, helicopter evacuation can be conducted from Manna Gum or Poplar Flat camping areas.

All construction and operational staff will be trained in the fire evacuation procedures, operation of fire equipment and prevention policies and communication protocols in the event of a fire.

Woodcutters Ecocamp

The Ecocamp has three 4WD/ATV routes that could provide for escape should a wildfire threaten the Goomburra area:

- Cascades and Ridge Trails and Banshee Fire Line to the west and descending to the Forestry Reserve Road;
- The Cascades Trail, descending to the Manna Gum Camping Area and linking to Forestry Reserve Road;
- The Winder Track to Mt Mistake along the re-opened Winder Management Road.

Additionally escape by foot into the Cascades (Dalrymple Creek) provides protection through deep, steep sided rainforest gully and permanent water.

Helicopter evacuation can be conducted from Manna Gum or Box Flat Camping Area.

All construction and operational staff will be trained in the fire evacuation procedures, operation of fire equipment and prevention policies and communication protocols in the event of a fire.

Canopy Ecocamp

The Ecocamp has one 4WD/ATV route and numerous off-road routes through cleared agricultural lands that could provide for escape should a wildfire threaten the Spicers Peak Nature Refuge:

- Fire line to the north and returning to Cunningham Highway
- Internal tracks that return to open country.

All construction and operational staff will be trained in the fire evacuation procedures, operation of fire equipment and prevention policies and communication protocols in the event of a fire.

4.8.1.3. Additional Management and Mitigation Measures

Engagement with QPWS, Rural Fires and local Bush Fire Brigades

Gainsdale Pty Ltd will actively participate in local bush fire brigades, the district Rural Fires and QPWS. At the beginning of summer and at key changes to fire ratings, Gainsdale Pty Ltd will liaise with local fire authorities. Gainsdale Pty Ltd will co-operate (and assist where of value) in relation to prescribed burns.

Suspension of Operations

In the event of an extreme or code red fire rating construction, maintenance other than fire protection related maintenance and tours/operation of the Scenic Rim Trail will be suspended.

Guest Briefings

All guests will be provided with a briefing on arrival at each Ecocamp as to the fire safety plan, the location of the marshaling area, the location of equipment and an overview of the current fire rating.

Open Fires and Wood Stoves

Open fires and wood fires will not be used at the Ecocamps. Heating for cooking and warmth will be supplied via gas units.

4.8.2. Workplace Health and Safety

A Draft Workplace Health and Safety Plan for the project has been prepared and is provided as Appendix 9.

4.8.3. Emergency Response

4.8.3.1. Fire

Communications

Gainsdale Pty Ltd will maintain a radio network that enables continual contact between Gainsdale Pty Ltd and the construction team and after opening with maintenance crews and ecoguides. Communications should also be established with QPWS local field personnel. Construction and maintenance crews, and guides will carry GPS equipped EPERBs. A battery powered portable AM/FM radio should be included in the fire safety kit of each Ecocamp.

Emergency Contacts List

Each building contractor, maintenance crews and guides will be supplied with emergency contact lists. Each Ecocamp will have a clearly visible emergency contact list.

Manifest

Gainsdale Pty Ltd shall maintain an accurate manifest of all guests on the Scenic Rim Trail along with a contact list of a family member or friend.

4.8.3.2. Other Emergencies

High rainfall events which result in the flooding of major creek systems such as Dalrymple Creek could affect both walkers and access to the Ecocamps by management staff. Additionally the road from Thornton to Mt Mistake is prone to land slips in very high rainfall events.

In the event of high rainfall walking trips would normally be cancelled or postponed. In the event of a high rainfall event while a walking group is already on the Scenic Rim Trail it may be necessary to suspend the walk and have walkers return to the nearest Ecocamp. There will be occasions when Dalrymple Creek rises significantly rendering access across the creek from Sylvester's Lookout to Woodcutters Ecocamp unsafe. An alternative, longer route using bush navigation can be utilised to get to Woodcutters Ecocamp by tracking above the creek system.

Ecocamps will be equipped with back-up food supplies to enable walking groups to wait out local flooding events.

In the event of flooding, walkers can be evacuated by ATV along the Winder Management Road and Winder Trail and by helicopter evacuated from Mt Mistake.

4.9. SOCIO-ECONOMIC

4.9.1. Overview

The Scenic Rim Trail and its associated Ecocamps provide an expansion to the range and diversity of recreation and tourism products in the region. Apart from the direct benefits of infrastructure spending and operational management of the Scenic Rim Trail, the project will lift the tourism profile of the region and provide opportunities that are associated with catalyst projects.

The Scenic Rim Trail project and the broader conservation projects of the Turner Family (via Gainsdale Pty Ltd) in the region contribute to the protection of the World Heritage values of the

Gondwana Rainforests of Australia and the broader values recognised within the Main Range National Park.

4.9.2. Employment

In the planning and construction phase of the Scenic Rim Trail employment in the planning, design, approvals and building stages will involve a wide range of specialists across:

- Strategic tourism planning
- Ecological services
- Fire management
- Tourism research
- Survey
- Landscape design/architecture
- Stakeholder engagement
- Legal
- Financial modelling
- Marketing and media
- Building.

During construction employment falls into two key components: trail/track construction; and Ecocamp/Wilderness Ecocamp construction. There will be a number of support staff involved in supporting these components. At the operational stage the employment profile will move to a trail/track maintenance function and a guest services function.

Once operational the Scenic Rim Trail will involve maintenance crews for both the trail/tracks and the Ecocamps. It will also involve the employment of guides, food and beverage, housekeeping and marketing staff.

4.9.3. Broader Economic and Community Benefits

The Turners have taken a long term view to the Scenic Rim Trail project, the Wildlife Centre and their other existing lodge properties in the vicinity of the Scenic Rim – Hiddenvale, Hidden Peaks, Spices Canopy and Spicers Peak Lodge. The investment in 8,000 ha bushland in the region, the creation of Nature Refuges, the development of a network of lodges and now the concept of the Scenic Rim Trail are part of an overall vision to present the heritage values of the Scenic Rim, in a way that will also achieve financial sustainability in the medium to long term. The Turner family appreciates that long range walking products are a niche market and that the development of a reputation as an iconic experience takes time, and must involve excellence at every level. Primarily however, they see the project as a contribution to conservation and the broader community, with the medium-term financial objective being operational cost recovery. The investment by Gainsdale Pty Ltd creates a catalyst for other economic and social enterprises in the region.

There will be many indirect benefits from this project for the local economy and community. In the construction phase these will come mainly from the multiplier effect of wages, capital and infrastructure spending, as well as from the marketing effects of building anticipation and interest in the new product offering. In the operational phase, the indirect economic benefits of the project will be generated via:

- providing additional recreation and accommodation infrastructure and opportunities – this contributes to increased visitation to the region in general, longer stays, as well as the ancillary use of Scenic Rim Trail by independent walkers. (A high proportion of these visitors

- will likely purchase local accommodation at the start and finish of the trail as well as spend locally on transport, fuel, food supplies and other miscellaneous goods and services);
- diversifying the tourism product range in the region – which improves resilience by broadening the appeal of the destination to different market segments;
- improving accessibility to, and linkages between, products and attractions – which makes the destination more attractive and contributes to higher visitation and longer stays;
- lifting the ecotourism standards in innovation and best practice – which makes the destination as well as the product more competitive in the eyes of discerning customers;
- expanding ecotourism training, skills development, business experience and operational knowledge of staff – this contributes to the overall quality and capacity of the local workforce; and
- Additional tourism marketing – which helps to attract more visitors and spending to the region in general.

4.9.4. Main Range National Park

Under the proposal Gainsdale Pty Ltd will fund and build approximately 18 km of new Class 5 walking trail to link up with existing walking tracks and internal management tracks. In total a walking trail of some 53 km will be created. This trail building will be available to the public to use under QPWS management regimes. Gainsdale Pty Ltd will also undertake the ongoing maintenance and monitoring on the sections that it constructs.

Additionally Gainsdale Pty Ltd will work in collaboration with QPWS over the entire Scenic Rim Trail to ensure that it is maintained in a condition that provides a high quality walking experience and the protection of the World Heritage and National Park values.

The re-opening of the 7 km narrow management track (locked gate entry) from Mt Mistake to Mt Castle Lookout road provides access to the northern sections of the National Park which will be of value in fire management, feral animal control (wild pigs are present in the northern areas) and emergency evacuation in times of flood or fire. It should be noted that the alternative route to traverse from Mt Castle Lookout to Mt Mistake is approximately 250 km.

The proposed Scenic Rim Trail is in alignment with the Management Statement for the Main Range National Park.

Under the commercial terms of the Scenic Rim Trail, the State will receive revenue based on Gainsdale Pty Ltd's use of the trail Ecocamp sites, contributing to State revenues.

4.9.5. Social Impact

4.9.5.1. Potential Social Impact at Regional Level

The Scenic Rim Trail project will not displace any existing economic or social activity in the region. It contributes to emerging ecotourism activity in the region and will create both direct and indirect employment in the region. As part of the total agricultural, conservation and tourism activities of Gainsdale Pty Ltd the Scenic Rim Trail is contributing to the sustainability of the regional economy and broadening the base upon which the economy is based. Economic activity will be enhanced both in the Lockyer Valley and Southern Downs Regional Council areas.

4.9.5.2. Potential Social Impact for Users of the Main Range National Park

The Scenic Rim Trail will expand the range of walking opportunities in the Main Range National Park. With the provision of some 53 km of continuous trail from Thornton to Mt Mitchell the Trail links up existing QPWS walking tracks and incorporates an additional 18 km of new trail.

The Scenic Rim Trail will attract additional walkers on to the existing QPWS tracks, specifically:

- Bare Rock Track
- Cascades Trail
- Ridge Trail
- Winder Trail.

There is no plan at present to modify these existing tracks. Any modifications considered in the future would require consultation with and approval from QPWS.

The social impact of the additional numbers is believed to be negligible as the low overall numbers of visitors that would use the Scenic Rim Trail. Based on 3.5 departures a week the existing tracks would have up to 32 additional ‘Scenic Rim Trail’ walkers per week generated by Gainsdale Pty Ltd.

5. MONITORING AND REVIEW

5.1. BIODIVERSITY

Ongoing monitoring programs of weeds, frog assemblage, *Euastacus jagara* population (should it be present), stream condition, water quality and trend and condition of vegetation and soil along the route will be undertaken to allow for an adaptive approach to the management of the potential impact of the proposal on biodiversity. These are summarised in Table 5.1. A pre-construction survey of stream sections downstream from each crossing will be conducted. Survey for frogs and *Euastacus jagara*, sample for water quality parameters and document stream structure through photographs. Frog survey would include sampling for evidence of Chytrid fungus.

Table 5.1. Proposed Monitoring Program

Monitoring	Extent and Frequency	Comment
Weed presence around all infrastructure and trails	Post construction baseline weed survey, then annual survey and reporting for first two years then five yearly. Ongoing feedback from ecoguides for any new weed occurrences. Weeds to be monitored and treated in accordance with an approved Weed Management Plan.	Post rain during growing season
Weed presence around Bunya Mountains Bluegrass population	Annual Assessment and reporting with ongoing feedback from ecoguides for new outbreaks especially from Broom Milkwort.	Post rain during summer growing season
Feral animal presence around all infrastructure and trails	Annual assessment and reporting with on-going feedback from ecoguides for feral animal signs and sightings. Feral animals to be monitored and managed in accordance with an approved Feral Animal Management Plan that will be developed in consultation with QPWS.	Control of existing level of Feral Pig presence would be a positive benefit of the project. Control required year-round.
Vegetation health and condition of trail	Regular assessment during operation by ecoguides. Structured annual assessment.	Conduct in conjunction with weeds for first 2 years
Hastings River Mouse population at Woodcutters	Baseline survey and annual survey for first three years of construction/operation then review. Reporting to QPWS. Survey most suitable habitat extent with 400 trap nights of trapping survey effort per survey as per survey guidelines (NSW DECC 2005), using 4 transects of 25 traps stratified by distance from the Ecocamp site.	Conduct in late summer (March-April), at the end of the breeding season

Monitoring	Extent and Frequency	Comment
Eastern Bristlebird habitat in the Mt Mitchell Trail Section	Baseline population and habitat condition surveys and annual surveys for first three years of construction/operation then review. Reporting to QPWS. Recommend the long term deployment of Song Meters to detect calls in suitable habitat near the trail.	Baseline survey outside of Aug-Feb breeding times (survey between Mar-Jan). Long term deployment of Song Meters is non-invasive and can be conducted year-round.
Stream condition adjacent to crossings	Continuous assessment during operation by ecoguides. Structured annual assessment.	Conduct in summer or early autumn
Frog assemblage adjacent to stream crossings	Baseline survey and annual survey for first three years of construction/operation then review. Reporting to QPWS.	Conduct in summer or early autumn
<i>Euastacus jagara</i> population	Baseline survey and annual survey for first three years of construction/operation then review. Reporting to QPWS.	Conduct in summer or early autumn

5.2. INFRASTRUCTURE

Monitoring	Extent and Frequency	Comment
Condition of constructed trail sections (steep slopes and a creek crossing)	Annual assessment with ongoing feedback from ecoguides for maintenance requirements.	Conduct in conjunction with vegetation health and general condition of route and vicinity.
Winder Management Road	Annual assessment of track condition with ongoing feedback from ecoguides for maintenance requirements.	Conduct annual assessment following rainfall between spring and early autumn.

5.3. OPERATION

Monitoring	Extent and Frequency	Comment
General condition of trail and precinct	Annual assessment with ongoing feedback from ecoguides (e.g. large tree fall)	Conduct in conjunction with vegetation health along route
National Park track user numbers	Monitoring of walker numbers on existing tracks that are part of the Scenic Rim Trail prior to and following commencement of operation.	Can be undertaken remotely using fixed cameras.

6. COMMITMENTS

The key commitments for environmental protection through the avoidance of disturbance, and environmental management and monitoring are set out in Table 6.1. These commitments have been developed through:

- understanding the environmental values of the Main Range National Park and Gondwana Rainforests of Australia;
- understanding the existing threats to the identified values; and
- determining the likelihood and severity of impacts that the project may present to the identified values.

The monitoring and management of all infrastructure associated with the Scenic Rim Trail, including new trails and overnight facilities, will be the responsibility of Gainsdale Pty Ltd. Gainsdale Pty Ltd will work with QPWS to monitor and manage those national park tracks and other facilities that form part of the Scenic Rim Trail route.

All construction contractors will be required to prepare and submit a Construction Environmental Management Plan (CEMP) that details measures to implement the commitments set out in Table 6.1 for the construction phase of the project. As a minimum, the CEMP must:

- Identify and assess the risk from, provide protection from, and provide a remedy for, any adverse environmental impact that may result from the construction and performance of any component of the works;
- Define the environmental responsibilities of the Contractor and of each person within the Contractor's management team;
- Include schedules of available resources, including personnel to deal with environmental incidents;
- Define the environmental safeguards and systems to be implemented for the works for reporting, monitoring, corrective action, auditing and the adoption of environmentally sensitive work practices. This must include:
 - Environmental awareness and induction
 - Storage and handling of dangerous goods
 - Storage, maintenance and refuelling of construction plant and equipment
 - Waste management and minimisation
 - Detection, treatment and disposal of contaminated materials and water
 - Water quality control measures
 - Erosion and sediment control plans
 - Hygiene prescriptions to prevent the spread of weeds, Phytophthora and other pathogens
 - Protection of aboriginal and historical cultural values
 - Protection of ecological values (e.g. threatened flora and fauna, animal breeding places) and
 - Incident response strategies for emergency conditions.

Regular progress reporting and incident reporting will be required from contractors.

A designated Scenic Rim Trail building and trail supervisor will oversee compliance.

An Environmental Management Plan (EMP) will be prepared for the ongoing monitoring and management of the Scenic Rim Trail operation phase. The EMP will incorporate those commitments set out in Section 5, Section 6 and Table 6.1 for the operation phase of the project. The EMP is to be reviewed every two years to ensure its suitability and effectiveness.

The far northern end of The Winder Management Road has been subject to weed invasion in the disturbance-prone Rainforest – Eucalyptus Open Forest ecotone. Additionally, the Winder Track has weed management challenges in open sunny areas around the clearing containing the 'winder' winch. Once the track enters the heavily shaded Rainforest sections, the occurrence of weeds is negligible. The proponent is committed to developing a weed management plan developed by its consultant botanist in collaboration with QPWS to rehabilitate the areas that have weed problems and to ensure that the weed free areas remain that way. ATV access to these areas will be essential to undertake weed control and rehabilitation work. The proponent is prepared to contribute \$35,000 per year in kind in weed control and rehabilitation work on the Winder Management Road and Winder Track. Weed control programs may involve groups such as Conservation Volunteers. Additionally, weed patrols along the entire length of The Winder Management Plan will be undertaken by Trail ecoguides on each walk to report on weeds which may have germinated.

Table 6.1 Environmental Outcomes and Project Commitments to Environmental Monitoring and Management

No	Commitment	Project Phase
Conservation Values		
1	The construction and operation of the project will be undertaken without affecting the integrity of the area and ensuring the maintenance and protection of conservation values.	Construction/ Operation
2	Gainsdale Pty Ltd will work with QPWS and will be responsible for the on-going management and monitoring of the effects of all infrastructure associated with the project.	Construction/ Operation
3	The World Heritage values of the area will be the focus of the development, and education of all guests will be part of the experience. Gainsdale Pty Ltd will consult with QPWS in the development of the educational program.	Operation
Flora		
4	Road re-construction constrained within a 2.5m wide corridor	Construction
5	Minimisation of clearing during re-construction	Construction
6	No net loss within Bunya Mountains Bluegrass population	Construction
7	Avoid/minimise removal of woody plants along Class 5 trail and Ecocamp sites	Construction
8	Avoid degradation along route	Operation
Weeds and Pathogens		
9	Equipment, vehicles, footwear cleaned before entering NP	Construction
10	Externally sourced material (rock or gravel) obtained from a source certified as low risk for weed and disease	Construction/ Operation
11	Trail route to detour patches of dead trees	Construction
12	Post construction weed survey, then annual survey for first two years then five yearly	Operation
13	Removal of dried mud from footwear and prior to entering NP	Operation
14	Chemical footbath at NP entry and Amphitheatre View and Woodcutters Ecocamp	Operation
15	Weed identification and plant health training (e.g. myrtle rust symptoms) for eco-guides	Operation
16	Annual survey of vegetation health and condition of trail	Operation
Terrestrial Vertebrate Fauna and Aquatic Environment		
17	No introduction of pests and pathogens via the project construction or operation	Construction/ Operation
18	Monitor stream condition, threatened frogs and Mt Mistake Spiny Cray at locations where the trail crosses watercourses annually for the first three years reporting to QPWS, then review to establish appropriate monitoring interval	Operation
19	Conduct a baseline survey of Hastings River Mouse at the Woodcutters Ecocamp site, annual surveys for the first three years of construction/operation, reporting to QPWS, then review to establish appropriate monitoring interval.	Pre- construction Operation
20	Conduct a baseline survey of Eastern Bristlebird population and habitat condition in the Mt Mitchell Trail section, annual surveys for the first three years of construction/operation, reporting to QPWS, then review to establish appropriate monitoring interval. Consider the long term deployment of song meters to detect the calls of Eastern Bristlebird in suitable habitat traversed by the trail.	Pre- construction Operation
21	Should Eastern Bristlebird be detected through survey and monitoring or reported by other sources from the vicinity of the proposed trail, preparation and implementation of a management strategy would be required. Gainsdale Pty Ltd has the capacity to develop a Breeding Program for Eastern Bristlebird at their Hidden Vale UQ Wildlife Facility for reintroduction to the Mt Mitchell habitat, if such a measure is considered prudent by stakeholders.	Construction/ Operation
22	Gainsdale Pty Ltd to continue to support the Brush-tailed Rock-Wallaby essential habitat mapping being undertaken by Healthy Waterways and Catchments Ltd.	Pre- construction/ Construction/
23	Avoid damage to or loss of habitat of fauna species of special conservation significance and minimise impacts of the Project on the habitat of commonly occurring fauna species	Construction/ Operation
24	Consult with QPWS regarding appropriate Chytrid fungus hygiene protocols for bushwalkers and for frog surveys. Include agreed protocols in a Fauna Management Plan for the operation of the Scenic Rim Trail.	Operation
25	Gainsdale Pty Ltd in cooperation with QPWS will conduct feral animal control programs on its adjoining land and will monitor and report on evidence of feral	Operation

No	Commitment	Project Phase
	animal activity along the Scenic Rim Trail on an ongoing basis	
26	Prepare and submit a Species Management Program to DEHP for approval to disturb animal breeding places	Prior to construction
27	Brush-tailed Rock-Wallabies are known from habitats on the northern boundary of Main Range National Park, and within private lands owned by the Turner family. While the SRT is not expected to have any impact on habitat for this species, Gainsdale Pty Ltd is funding the completion of Essential Habitat mapping of Brush-tailed Rock Wallabies in Queensland in partnership with Healthy Catchments and Waterways Ltd (formerly SEQ Catchments), in order to contribute to the understanding and conservation of the species.	Pre-construction/ Construction/ Operation
Cultural Heritage		
28	Consultation to take place. Gainsdale Pty Ltd specialists will follow guidelines set out by the Australian Heritage Commission Ask First publication and the Queensland Department of Aboriginal and Torres Strait Island and Multicultural Affairs Protocols for consultation and negotiation with Aboriginal People	Project planning stage
29	The priority option for Aboriginal or other historical artefacts identified from within the corridor is to re-route the trail to avoid the site	Construction/ Operation
30	Artefacts are not to be removed or interfered with during construction and operation of trails	Construction/ Operation
31	Visiting historical features (e.g. the log chute) will not occur in the absence of detailed site assessment and trail access.	Operation
Soil and Water		
32	Preparation of individual Erosion and Sediment Control Plans for construction of each overnight node and for any trail construction sections greater than Class 5 level	Construction
33	Continual survey of trail condition by ecoguides to inform any requirement for stabilisation/remediation.	Operation
34	Confinement of all hazardous materials to suitably designed structures (e.g. bunded enclosures).	Construction/ Operation
35	Monitoring of walker numbers on existing tracks that are part of the Scenic Rim Trail prior to and following commencement of operation.	Prior to operation
Health and Safety		
36	All construction and operational activities to be carried out under an approved Health and Safety Plan	Construction/ Operation
Construction		
37	All contractors will prepare a Construction Environmental Management Plan for their works	Construction
38	The track is to be constructed to the requirements of Australian Standard 2156 Class 5 track	Construction
39	Any areas disturbed during construction that are not required for operational purposes to be rehabilitated using local provenance species under an approved Rehabilitation Plan	Construction
Operation		
40	Preparation of an Environmental Management Plan for the Operation of the Scenic Rim Trail and associated accommodation nodes	Operation
41	Monitoring of walker numbers on existing tracks prior to and during operation of the Scenic Rim Trail	Operation
42	Prepare and implement a Solid Waste Management Plan	Operation
43	Prepare and implement a Water and Waste Water Management Plan	Operation
44	Prepare and implement a Fire Management Strategy and Emergency Management Plan	Operation
45	Gainsdale Pty Ltd will consult with QPWS in the development of signs and interpretive displays to ensure consistency of signage and messages with those of the National Park and WHA	Operation

7. CONCLUSION

The Master Plan for Queensland's parks and forests to 2025 includes among the QPWS core service areas: (i) managing parks and forests for conservation and for people, and (ii) facilitating ecotourism, recreation and heritage experiences within the protected area estate. One of the challenges emphasized in the Master Plan is that of balancing improved conservation with the growth of the tourism industry, and providing better access for all Queenslanders and visitors.

This is the core of the assessment of the suitability of the Scenic Rim Trail project - balancing the opportunity for the development of a world class ecotourism experience within the Main Range National Park and Gondwana Rainforest World Heritage Area with achieving the goal for improved conservation outcomes.

The proposal is for low-intensity recreation activities, with predominantly least structured (Class 5) walking trails and low-impact overnight accommodation along the approximately 53 km trail. The proposal makes use of existing tracks and roads, and requires the establishment of approximately 22.9 km of new trails. Some sections of the trail make use of existing National Park tracks, and overnight accommodation nodes would be sited in two locations within the National Park. There is no requirement to remove any remnant canopy or mid-story vegetation for the trail and accommodation nodes.

Assessment of the potential impacts of the project on the biodiversity values of the National Park finds that there are known and potential species of special conservation significance present in the project area, and that appropriate design, mitigation and management actions will avoid significant impacts on those species. Potential impacts assessed as requiring particular attention are:

- Ensuring there are no impacts on aquatic environments to protect habitats for stream-dwelling frogs and the Mt Mistake Spiny Cray;
- Ensuring there is no impact on the habitat of the Hastings River Mouse adjacent to the Woodcutters Ecocamp;
- Ensuring there is no impact on the habitat of the Eastern Bristlebird and no disturbance to nesting Eastern Bristlebirds south of Cunningham's Gap should the species be recorded in the future;
- Preventing the introduction and/or spread of weeds, pathogens and feral animals;
- Controlling the existing Feral Pig population.

The specific management of Main Range National Park is set out in the Main Range National Park and Spicers Gap Road Conservation Park Management Strategy 2013 which stresses the conservation values of the National Park for flora and fauna habitat and wildlife movement, and as the northern-most extent of the World Heritage listed Gondwana Rainforests of Australia, which make up 77% of the total National Park area.

This proposal addresses the desired outcomes of the Master Plan through stating responsibility to those outcomes through project design and committing to management actions for:

- Fire management and fire safety
- Cooperation with QPWS and surrounding landholders
- Pest (weed, feral animal and pathogen) management
- Protection and restoration of biodiversity values
- Programs for better understanding biodiversity values through a range of monitoring programs
- Maintaining landscape integrity through sensitive, low-key design.

The Master Plan indicates that the Strategic Overview for Management of the Gondwana Rainforests of Australia World Heritage Area also applies to management of Main Range National Park. The Strategic Overview identifies the World Heritage Area as an important recreational resource, attracting a growing number of local and overseas visitors and contributing significantly to the economies of local communities. It also recognises that the level of visitation places extra responsibilities on managers to provide additional recreational opportunities without compromising ecological sustainability or the values that lie behind the listing.

The required management responses to relevant issues set out in the Strategic Overview that are relevant to the project are addressed in this report. The proposal is able to meet the necessary management responses through a combination of design, planning, consultation and formulation of appropriate management and monitoring actions. Through the presence of ecoguides on the trail on a very regular basis, there is a significant opportunity for continuous monitoring and adaptive management.

An assessment of the potential impact of the project on World Heritage Values and other matters of national environmental significance will be the subject of a referral of the project to the Commonwealth government.

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