

SHIRE OF YORK

**MOUNT BROWN  
TRAIL  
MAINTENANCE  
GUIDE**

**2019**



SHIRE OF YORK  
**MOUNT BROWN  
TRAIL  
MAINTENANCE  
GUIDE**  
2019

Prepared by Common Ground Trails Pty Ltd for the Shire of York

**Acknowledgements:**

The authors of the Mount Brown Maintenance Guide acknowledge the Traditional Custodians of the land on which we work and live, and recognise their continuing connection to land, water and community. We pay respect to Elders past, present and emerging.

**Photography:**

See images for credits.

Cover image: View from Mount Brown. Image credit Common Ground Trails

**Disclaimer:**

Common Ground Trails Pty Ltd, its employees, directors and associated entities shall not be liable for any loss, damage, claim, costs, demands and expenses for any damage or injury of any kind whatsoever and howsoever arriving in connection with the use of this document or in connection with activities undertaken on trails generally.

While all due care and consideration has been undertaken in the preparation of this document, Common Ground Trails Pty Ltd advise that all recommendations, actions and information provided in this document is based upon research as referenced in this document.

Common Ground Trails Pty Ltd and its employees are not qualified to provide legal, medical or financial advice. Accordingly, detailed information in this regard will require additional professional consultation in order to adequately manage and maintain the facilities and reduce risk.





# CONTENTS

INTRODUCTION	4
TRAIL ASSESSMENT	4
FUNDING AND RESOURCES	6
KEY RESPONSIBILITIES	6
HAZARD INSPECTION AND REPORTING	6
AUDIT PROGRAM	7
MAINTENANCE FREQUENCY	7
MAINTENANCE STANDARDS	7
SIGNS OF TYPICAL TRAIL WEAR	7
MAINTENANCE ACTIVITIES	7
EXISTING TRAIL AUDIT	8
APPENDIX A TRAIL MAINTENANCE INSPECTION SCHEDULE	15
APPENDIX B TRAIL ASSESSMENT FORM	16
APPENDIX C HAZARD RATING MATRIX	17

## INTRODUCTION

The purpose of this guide is to provide the shire of York with information to help in the management of the mountain bike trails on Mt Brown. It comes in response to the growing popularity of the trails and increased facilitation of successful MTB events on the hill. In presenting general principles of trail maintenance and applying them to the unique context of Mt Brown, this guide aims to help assess trail condition and the potential impact of mountain bike events. A key aim of the document is to promote healthy working relationships between the shire, trail volunteers and event organisers to ensure trails remain fit for purpose.

It is important to note that the informal nature of the trails on Mt Brown pose challenges to the application of trail management guidelines for the area (including the information presented in this document). The trails are not officially mapped, signed or graded (for trail difficulty), a situation which allows for greater amounts of ambiguity in the way guiding principles of trail maintenance be applied to the area.

The Shire of York trails master plan 2019 – 2028 (2019) highlights the importance of a trails concept plan for Mt Brown which will allow “for proper management of the reserve and offers opportunity for community involvement in design, management, maintenance and rehabilitation programs” and recommends an official network of trails be established in the short term as a high priority. This Maintenance Guide should be viewed as an interim measure only and it is important that the concept plan is progressed and a full assessment of risk and maintenance is undertaken.

## TRAIL ASSESSMENT

Mountain bike trail maintenance involves the implementation of construction methodologies to effect change on trail predictability, ride quality, trail sustainability and ongoing environmental impact. Any decision to perform work on a mountain bike trail is made on balance. Mountain bike trails are unique in that they occupy a point between the built environment and the wild and any decision to work on a trail should be made in balance against preserving elements of desirable “trail character”. Elements of trail character develop over time through the interaction of bikes with the natural environment. They are a large factor in what makes a mountain bike trail unique and can be of great benefit in determining whether a trail has “worn in” or “worn out”. Performing a trail assessment before carrying out any work to an existing trail is the best way to help ensure the most considered (most correct) outcome is achieved. The following elements should be considered when assessing a trail.

### TECHNICAL DIFFICULTY (GRADE)

A trails technical difficulty is graded (and sign posted) through the application of an objective classification process. A trails grade is based upon the on technical features present, the exposure risk and trail gradient both average and maximum. The most relevant document to establish trail grading in Western Australia is the [Western Australian mountain bike management guidelines](#).

As Mt brown has no formal trails, no trail grading currently exists and trail work cannot be carried out in accordance with trail grade.

There are risks in allowing the continued use of trails without grading and signage. This should be addressed by undertaking the concept plan which will lead to a trail development plan outlining trail recommendations, trail classifications and signage.

## TRAIL STYLE

A trail's style is a description of both the technical specification of the trail and likely rider experience. For example, A trail may be built in a heavily profiled way with the use of machinery to remove natural features and enhance a bike riders movements (flow trail) or it may be a trail which is minimally constructed, drawing experiential value from the natural landform to create a more technically demanding trail (natural profile single track). Understanding a trail's style will help greatly in making appropriate choices in which construction techniques are applied in trail maintenance. Elements of trail style are not necessarily mutually exclusive. For example, flow and natural technical elements may exist in the same trail. It is important however to maintain predictability in how the trail can be read by the rider. This is generally achieved by packaging certain styles of trail into sections of experience with obvious signifiers of a change in style at transition points.



Figure 1 Trail Classification types (refer to WA MTB management Guidelines)



Figure 2 Flow trail example



Figure 3 Natural profile trail style

## TRAIL CONTEXT

In determining how a trail is to be maintained, the trail must not be assessed in isolation. Usually a mountain bike trail will have a localised context, that is a part of a trail network or riding area or town. Also important is the broader social context of what mountain biking is as an activity from place to place.

### Local

What function does a trail have in relation to other trails in the area? Is it the only downhill trail? Is it the easiest trail on the hill? What are the other trails like in the area or town. Is this trail predictable or readable in relation to other trails in the area? Or is it deliberately different?

### Social context

What is "mountain biking" to the riders of the town, state or country where the trails exist? Is mountain biking seen to be a progressive sport or a recreational activity? Are there other sports or elements in the society which influence the average rider's view on what riding a mountain bike involves?

For example the snow and mountain sport focused cultures of Canada and New Zealand have generally fostered a more progressive environment for mountain bike trail development than we have in Australia where safety culture has generally seen a more conservative approach to trail planning, design and construction. No matter the destination, all sanctioned trails have a classification which is typically based on the International Mountain Bike Association (IMBA) Trail difficulty Rating System.

### Environmental

Environmental considerations are extremely important in deciding on which construction techniques are employed during trail panning, construction and maintenance. During the concept planning process, environmental consultants will provide map overlays of areas which are free from constraints, areas to be avoided or areas which have particular considerations in how mountain bike trails be built. The ecological value of the flora and fauna present, the identification of threatened species or larger trees are examples of environmental considerations which may have an impact on where mountain bike trails are constructed, what style of trails are preferable and will greatly inform the guidelines around how the trails in an area are maintained. The Geological stability of the landscape, the soil types and how prone the soil is to weathering and erosion is another important consideration in the management plan for an area.

An example of environmental context informing trail maintenance guidelines would be in areas where spread of phytosphthora dieback is a concern. As dieback spreads via the transportation of loose muddy soil, the prevention or rectification of puddling will be a high priority. Maintenance programs will have a heavy focus on trail armouring and trail profiling to maintain a well-draining trail tread. In areas where the spread of dieback is less of a concern, then a maintenance program with less focus on controlled water management, in favour of retaining elements of natural trail character may be more appropriate.

The Shire of York is currently in the process of engaging in environmental surveys of the Mt Brown reserve, however no information is currently known on the potential impact of mountain bike trails in the area.

## Tenure

The Governance and management policies of the owner or manager of a land area will have an impact on the style of mountain bike tracks constructed and the guidelines for their ongoing maintenance.

The environmental classification of the area will also play a big role in the styles of mountain bike trails in an area and how they are maintained. The styles of trail appropriate to an area are identified by the projected environmental impact of trail, the anticipated user groups of a style of trail (including potential conflict between new and existing users) and the expected increase in traffic a mountain bike trail is likely to bring into an area.

Beyond planning decisions, there are also legal elements which must be considered in regard to land title. There are areas of land where the development of mountain bike trails is not legal. In these areas, the law states that mountain biking is not an appropriate activity and the development of mountain bike trails is not a legal consideration, unless the title of the land area is changed.

The [Western Australian Mountain Bike Management Guidelines](#) provide a comprehensive body of information in regard to assessing mountain bike trail difficulty, trail sustainability and in forecasting the environmental impact a trail will be likely to have into the future.

## FUNDING AND RESOURCES

Funding or management and maintenance of the trails will be sourced from a combination of Shire of York's ongoing parks and facilities budget, fundraising by community groups and works by event organisers in the lead up to and following events.

## KEY RESPONSIBILITIES

MANAGEMENT TASK	RESPONSIBLE PARTIES
Hazard inspection and reporting	<p>Volunteer Stakeholders will report hazards on an adhoc basis through receiving community feedback on the trails, via social media or regular club activities.</p> <p>Volunteer Stakeholders will remedy any minor hazards (such as fallen branches, blocked drainage) as part of routine maintenance activities or in preparation for events.</p> <p>Major hazards such as fallen trees, areas of erosion, illegally built features, can be reported to the Shire via email, phone, or in person at the Shire office, and will subsequently be inspected by the Shire of York staff.</p> <p>A professional trail construction contractor should inspect the trail on an annual basis, to assess major issues and risks.</p>
Trail Maintenance	<p>Volunteer Stakeholders will perform minor preventative and reactive maintenance works. Some minor works may require prior Shire approval.</p> <p>Shire of York will assess, manage and perform major maintenance works, refer to maintenance schedule.</p>

## HAZARD INSPECTION AND REPORTING

Trails will be subject to varying weather conditions, wear and tear and potentially vandalism, which may create hazards to trail users. Hazards on the trail should be recorded under the Shire's parks asset management system and high risk hazards should be eliminated as soon as discovered.

During trail auditing hazards should be rated, using a pre-agreed risk rating system outlined in a Trail Adoption Agreement (refer Appendix C for example). This can be done by carrying out a risk assessment on each hazard as it arises. Should the hazard be deemed high risk measures should be taken to prevent injury. This may take the form of temporary trail closure, or in some circumstances warning signage and bunting may suffice.

Communication protocols are typically outlined in the Trail Adoption Agreement and the reporting party should let all other relevant parties know of any trail closures or hazards. Temporary signage at trail accesses, social media posts, a Trails WA trail alert and email updates to stakeholders are all methods of communication that should be considered if there is a need to close the trail for maintenance. Any works on the trail should also display relevant warning signage to protect both the worker and the trail user.

Hazard reporting should be consistent and all data should be retained for future reference. Hazard reporting should be conducted using the template within the Trail Adoption Agreement (refer WA MTB Management Guidelines) and maintenance inspections should be carried out at the agreed intervals, and by the agreed parties, specified in the Trail Adoption Agreement.

Please note there is currently no Trail Adoption Agreement for the existing informal trails, in the interim the information provided here and the matrix in Appendix C provides some guidance.

## AUDIT PROGRAM

While the audit program aims to prevent the need for major maintenance works, it is important to ensure that ad hoc maintenance activities are undertaken from time to time as required. The trail audit will detail any issues that require maintenance, such as:

- Trail surface issues
- Drainage problems
- Vegetation regrowth on the trail
- Condition of signage
- Condition of technical trail features (TTFs)

Refer to appendix B for a sample Trail Assessment Form.

## MAINTENANCE FREQUENCY

Frequency of trail maintenance depends on factors such as the amount and type of use, soil type, vegetation type and where the trail is located. Extreme weather events may necessitate unscheduled maintenance and hazard checks. Trail maintenance should be recorded in the Trail Maintenance Schedule (refer appendix A).

## MAINTENANCE STANDARDS

All trail work must adhere to the WA Mountain Bike Management Guidelines specifications and dimensions.

Trails and TTFs should be maintained to the original classification, as per the documented trail design. When undertaking maintenance works, the following standards should be adhered to:

- No material, apart from drainage clearing, is moved without prior approval by the Shire of York.
- Trail surface should be maintained to the original classification.
- Signage should be maintained to the style and in locations as per the documented signage design.
- Visitor risk management processes should be in accordance with Shire of York requirements, e.g. site closures, signage and notification of works.
- Drainage should be maintained to minimise the pooling of water or erosion on or adjacent to the trail.

## SIGNS OF TYPICAL TRAIL WEAR

Trails typically change over time with use. Trail surface change is acceptable provided:

- The original trail classification is maintained. This means the trail dimensions, corridor clearance, specifications and features on the trail remain within the required standard. (Refer WA Mountain Bike Management Guidelines for further information regarding trail classifications).
- No environmental issues have been caused, such as erosion, track creep, excessive pruning/damage to vegetation.
- All TTFs are of sound construction.
- Standing water is not settling on the trail surface.

## MAINTENANCE ACTIVITIES

Refer to Appendix A for Trail Inspection and Maintenance Schedule which outlines things to look for and frequency of inspection/maintenance required

### Minor Works

Minor works are considered to be those which can be performed by hand using small non-powered hand tools (i.e. shovels, rakes, secateurs).

### Minor Works for approval

Minor works requiring the Shire of York's approval include:

Those which require powered tools or machinery

Trail head and orientation signage modifications and installation

### Major Works

Major works are considered to be those which require a section of trail to be closed temporarily, where there is no alternative re-route available, and/or require use of machinery and/or specialised equipment. All major works will require Shire of York approval and supervision, the community should be notified of all trail closures.

## USEFUL RESOURCES

The following resources provide further information regarding trail planning, development, construction and management:

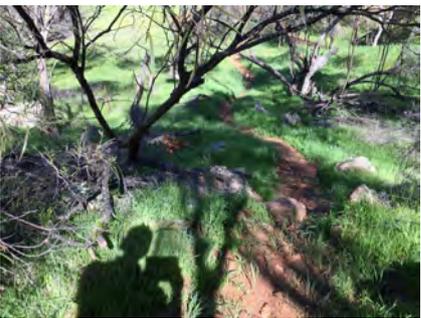
- [Western Australian mountain bike management guidelines.](#)
- Trail Solutions - IMBA's Guide to Building Sweet Singletrack by the International Mountain Bicycling Association
- Managing Mountain Biking - IMBA's Guide to providing great riding by the International Mountain Bicycling Association
- Natural Surface Trails by Design, Physical and human Design Essentials of Sustainable, Enjoyable Trails by Troy Scott Parker

## POTENTIAL ISSUES ON MOUNT BROWN

As an interim measure, prior to development of a sanctioned network of trails on Mount Brown, a basic trail audit of existing trails was undertaken, Table 1, Table 2 and Figure 4 outline the identified existing and potential issues and recommended remediation measures.

Please note this audit was not comprehensive and serves as an example of issues to be looking for in management of existing informal trails prior to development of a sanctioned network.

Table 1. Existing issues

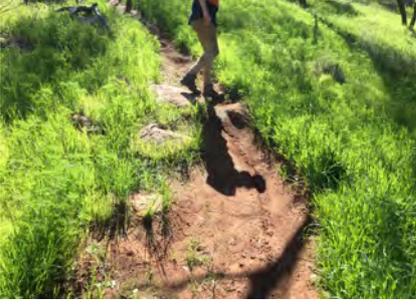
ISSUE ID	PHOTO	DESCRIPTION	RECOMMENDATION
E01		Suspended dead tree	Remove tree
E02		Dead tree	Remove tree
E03	N/A	Dead tree cluster	Remove tree
E04		Pedal snag, impale risk	Prune vegetation
E05		Impale hazard	Prune vegetation
E06		Risk of stabbing	Prune vegetation

ISSUE ID	PHOTO	DESCRIPTION	RECOMMENDATION
E07		Water scour	Remediate trail surface to improve drainage

Table 2. Potential issues

ISSUE ID	PHOTO	DESCRIPTION	RECOMMENDATION
P01		Drainage issues	Remove lower edge of cupped trail profile to make best use of grade reversal to enhance drainage
P02		Drainage issues	Remove lower edge of cupped trail profile
P03		Monitor breaking points for acceptable trenching.	Armour when necessary.
P04		Hanging tree may get lower and become an issue	Monitor and remove tree if necessary

ISSUE ID	PHOTO	DESCRIPTION	RECOMMENDATION
P05		Water scour and breaking.	Armour when necessary
P06		Natural off camber profile. Watch for excessive soil movement/soft spots post high traffic periods/events	Re-profile when needed
P07		Potential soft spot/water catch.	Armour if needed
P08		Rebuild catch with stone to extend life if showing excessive wear	Armour if needed

ISSUE ID	PHOTO	DESCRIPTION	RECOMMENDATION
P09		Potential soft spot	Armour if needed
P10		Profile to minimise water run	Re-profile when needed
P11		Potential for scour.	Armour if needed
P12		If rut gets beyond reasonable, reset profile	Re-profile when needed
P13		If rock becomes too exposed, reface corner	Re-profile when needed

ISSUE ID	PHOTO	DESCRIPTION	RECOMMENDATION
P14		Potential soft spot	Armour if needed
P15		Potential soft spot	Armour if needed
P16		Tight corner after fast straight potential blown profile and trail widening	Re-profile when needed
P17		Tight turn potential trail widening	Re-profile when needed

ISSUE ID	PHOTO	DESCRIPTION	RECOMMENDATION
P18		Monitor post event for any unpredictable holes or in turns or features	Re-profile when needed
P19		Potential soft spot	Armour if needed
P20		Potential soft spot	Armour if needed
P21		Cupping potential soft spot	Armour if needed
P22		Potential widening of trail exit post event	Re-profile when needed



Figure 4 November 2019 general trail audit - examples of existing and potential identified issues

APPENDIX A TRAIL MAINTENANCE INSPECTION SCHEDULE

MAINTENANCE	FREQUENCY				NOTES	WHO		
	MONTHLY	QUARTERLY	ANNUALLY	AFTER STORM		OTHER	Volunteers	SoY
<b>SIGNAGE</b>								
Inspection condition and location			●		Are the signs in good condition? Are the markers appropriate to the trail classification? Are the signs coherent at intersections?		✓	✓
<b>TREAD</b>								
Inspect surface			●		Are there signs of erosion? Is water pooling on the tread? Is there debris to remove? Is extra drainage required?		✓	✓
<b>TECHNICAL TRAIL FEATURES</b>								
Inspect Condition		●			Is the feature structurally stable? Is it maintained to original specifications? Have alternative lines been created?		✓	✓
Check fall zones		●			Are fall zones clear of hazards e.g. sharp rocks or logs?		✓	✓
<b>DRAINAGE</b>								
Check condition of drains		●		●	Are drains full of leaf litter or silt? Are culverts clogged?		✓	✓
<b>VEGETATION</b>								
Check sight lines			●		Does vegetation need to be cleared from trail corridor to maintain sightlines?		✓	✓
Check intersections			●		Are intersections and signage visible?		✓	✓
Check trail corridor and overhead			●		Is the trail corridor clear of vegetation appropriate to its classification?		✓	✓
Check signage			●		Is signage visible?		✓	✓



## APPENDIX C HAZARD RATING MATRIX

			INSIGNIFICANT	MINOR	MODERATE	MAJOR	SUBSTANTIAL
		SAFETY	can keep riding /walking	minor injury/ sickness	moderate injury/sickness	major injury	permanent injury/death
		ENVIRONMENTAL	can remedy without tools	remedy with tools	repairable damage < 1 day work to modify	Repairable damage > 1 day work to rectify	irreversible damage
		QUALITY	meets relevant trail standards	acceptable alternative to relevant trail standards	some work needed to meet standards and create sustainable trail/feature	not acceptable below standard major works needed to meet standards	not acceptable below standard major works needed to meet standards
LIKELIHOOD	ALMOST CERTAIN	This will most likely happen every time the trail is used	MEDIUM	HIGH	HIGH	EXTREME	EXTREME
	LIKELY	It has happened	MEDIUM	MEDIUM	HIGH	HIGH	EXTREME
	POSSIBLE	It's possible if you don't know what you're doing, or you're unlucky	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
	UNLUCKY	Not likely, but it could happen	LOW	LOW	MEDIUM	MEDIUM	HIGH
	RARE	I've never heard of it happening, practically impossible	LOW	LOW	LOW	MEDIUM	MEDIUM