



**MONKEY ROCK SPEED RUN MONITORING REPORT:
AUGUST 2018**

REPORT No. CENRM149 (2018)



**Prepared for:
The Shire of Denmark**

**Prepared by:
The Centre of Excellence in Natural Resource Management**

August 2018

18 June 2019 - Attachment 8.2.2

Centre of Excellence in Natural Resource Management, The University of Western Australia.

TITLE Monkey Rock Speed Run Monitoring Report: August 2018

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DATE September 2018

PUBLICATION DATA Benson, J. (2018). Monkey Rock Speed Run Monitoring Report. Results from monitoring in August 2018. Report No CENRM149. Centre of Excellence in Natural Resource Management, University of Western Australia. Cover Photograph: Firebreak - Site 14, August 2018.

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Introduction

Monkey Rock is one of two prominent granite outcrops within the Shire of Denmark's Mount Hallowell Reserve, along with the peak of Mount Hallowell itself (GS 2008). It is a highly visible and iconic feature of the region, and provides expansive views of the southern coastline. The surrounding area has significant ecological and cultural values, and while it is not known to include any threatened or priority ecological communities there is a diverse range of flora, fauna and fungi, and a number of threatened species are present (GS 2008, Syme 2011, McQuoid, 2012). *Phytophthora cinnamomi* (dieback) is present in parts of the Reserve, and preventing further spread is a priority for the protection of rare plant species and the broader ecological community (GS 2008, Spencer 2014). Ongoing population growth and development on the south coast has placed greater pressure on the area. Monkey Rock is a popular point for hikers on the Bibbulmun track, and is used for nature-based site-seeing as well as abseiling and rock climbing (GS 2008). It is important that the values of Monkey Rock and the wider Reserve are appropriately managed and maintained.

The Denmark Mountain Bike Club (DMBC) held the inaugural Monkey Rock Speed Run at Mount Hallowell on Sunday 5 August 2018. Beginning at the Monkey Rock Lookout, the course descended the granite outcrop before entering a firebreak and continuing down to the Lights Road car park. The organisers put in place a number of measures to safeguard the area from damage from riders and spectators (pers. comm. DMBC President). For example, before accessing the course all attendees were given a pre-race briefing, which highlighted the various values of the area and the mitigation measures that were in place; access to the granite outcrop required an additional induction, and only a restricted number of people were permitted; the outcrop was managed by four marshals, and a maximum of ten riders were allowed at any time with no more than five on the summit; contact between bikes and mossy areas was prevented by installing small timber-steel bridges, with a carpeted base to prevent damage to the surrounding granite; the course was limited to 2.5-3m width which was clearly defined by cones on the outcrop, and bollards and tape on the firebreak; use of the firebreak rather than the adjacent Bibbulmun track prevented damage to the track and surrounding woodland; a three-stage system for dieback prevention, consisting of an initial water scrub for the bikes, followed by hosing

down with fire-fighting gear, and finally a boot cleaning station for spectators and riders. The event attracted 55 riders, which exceeded the 30-50 anticipated by the DMBC, as well as 100-150 spectators. The organisers considered the Speed Run to be a success, and hope to run it again in 2019. This report was commissioned by the Shire of Denmark leading up to the event. The aim was to collect various parameters to assess any impact on the area. The objective was to establish sites that could be used for preliminary and ongoing assessment in order to guide management of the area should future events be approved.

Methods

The Monkey Rock Speed Run was held on Sunday 5th of August 2018. The course was ~2.5-3m wide, defined by cones or bollards and barrier tape. It included a 100m section of granite outcrop and a 700m section of firebreak leading to the carpark on Lights Road. The outcrop contained occasional shrubs and small trees, as well as lichens and mosses which were most prominent in gaps and incisions in the granite. The firebreak ranged from approximately 4-8 m wide, and was clay/gravel surrounded by woodland. Vegetation along the firebreak was largely *Eucalyptus diversicolor* and *Allocasuarina* species, with *Bossiaea linophylla* and various sedges in the understory. *Agonis flexuosa*, *Taxandria* and *Lepidosperma* species became more prevalent in the lower lying areas.

Baseline sampling was undertaken on the Thursday prior to the Speed Run, with follow up sampling on Thursday 16th of August. Bollards were not in place during sampling so we used our best judgment to ensure quadrats and transects would fall within the course. The weather during baseline sampling was very wet, with hail during some parts of the day, while during follow up sampling the weather was mostly fine with some drizzle. The upper (granite) and lower (firebreak) sections have been treated separately because sampling methods differed for the two areas.

Sampling on the granite: During baseline sampling we haphazardly selected seven photo-points where moss and lichens were likely to be impacted by the bike-trail, and took photographs with a digital camera from ~900mm high, parallel to the slope of the rock, laying a tape measure on the rock for scale. The procedure was repeated at those photo-points during follow up sampling, and each photo-pair was used to qualitatively assess impacts at each point.

Sampling on the firebreak: Transects were collected at ~30m intervals along the length of the firebreak. At each transect we measured the firebreak width, the maximum incision depth, and slope (rise/drop over 180cm distance). The course was intended to run down the left hand two thirds of the firebreak for the majority of its length (pers comm. DMBC President), so we restricted incision and slope measurements to that area. We then assessed a 1m strip of vegetation on either side of the firebreak, 5m up and downhill of the transect for (1) number of trees, and (2) number of trees with scarring, and made note of any evidence of trampling. Changes in parameters are described and discussed, and where possible, assessed using paired t-tests in R Studio.

Results

Granite: There was no evidence of any impact from bikes in any of the photo quadrats (Figure 1). The only obvious damage to moss was from kangaroo tracks near location six (Figure 2a). A faint trail of dirt from tyre-tracks was still evident in places, which highlighted that the course generally avoided mossy areas. Where the course crossed such areas, the small bridges that were implemented on the day prevented contact from the bike-tyres (evident in Figure 2b).

Firebreak: There was a significant change in incision depth ($P < 0.05$) and slope ($P < 0.05$) (Figure 3), however there was almost no evidence of incisions from bike-tyres, with car-tyres tracks being more obvious (although only minimal). Erosion from runoff was far more obvious than effects from either bikes or cars, and caused obvious changes in slope including build up from sedimentation in some places (Figure 4 a-c).

There were few trees within 1m of the firebreak (mean = 1.3/transect), and there was no evidence of tree-scarring from bikes (data not presented). Bark was missing from a few trees along the course, however this may have been from natural weathering. These trees were not within our sampling areas so there were no pre-race photos for comparison, and they may have been in similar condition during baseline sampling (Figure 4 d-f). There was no evidence of trampling in the vegetation adjacent to the firebreak. Debris that had been cleared from the firebreak for the event was piled up in some places, but this only impacted vegetation which was clearly within the firebreak.

Before

After

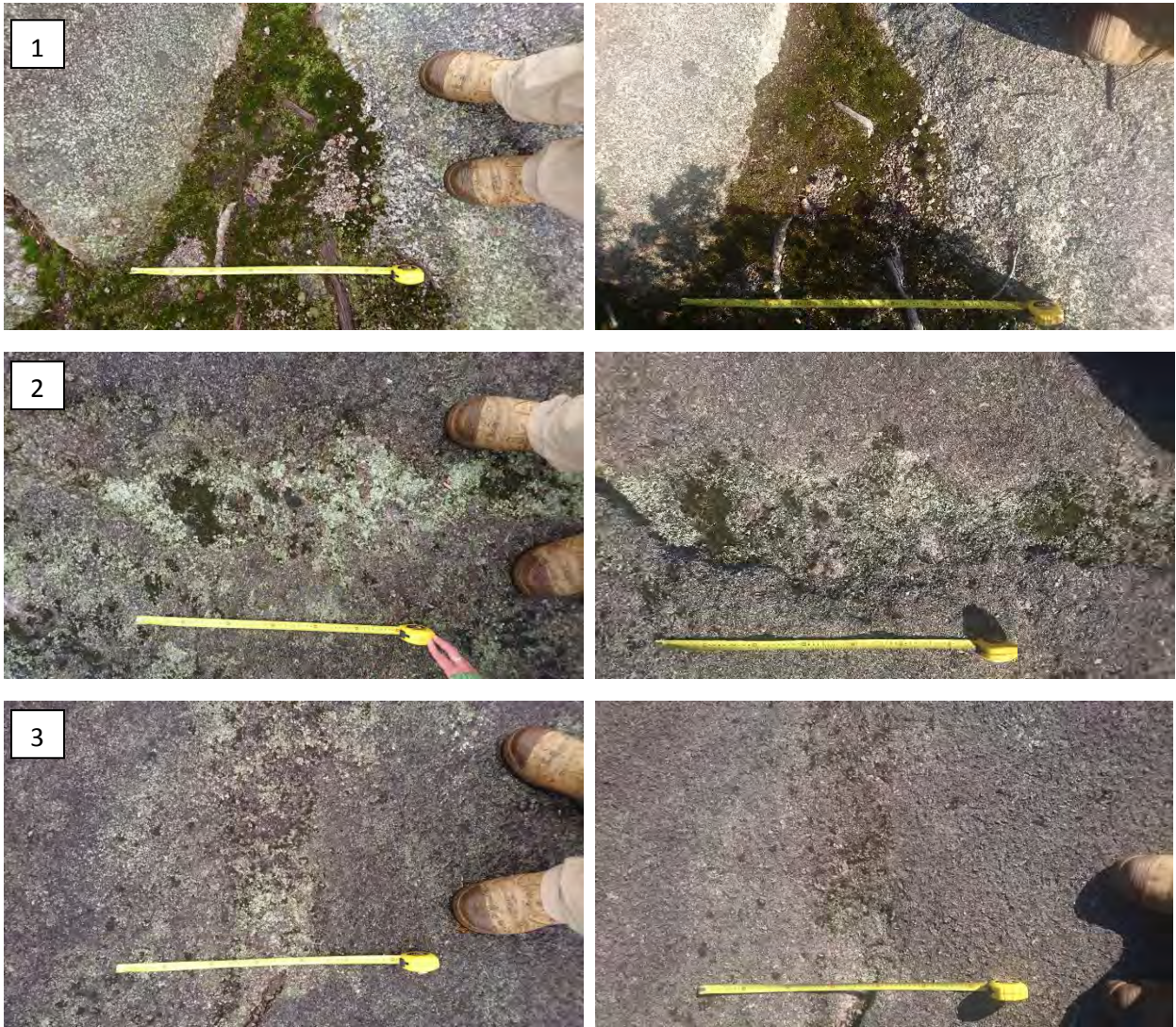


Figure 1: Photo-quadrats at locations 1-7 showing moss/lichen condition on Monkey Rock before (left) and after (right) the Speed Run (continued next page).

Before

After





Figure 2: (a) Disturbance from kangaroo tracks. (b) Gaps were bridged during the event, preventing damage to moss. This is evident from the faint tyre-tracks on the upper and lower rocks.

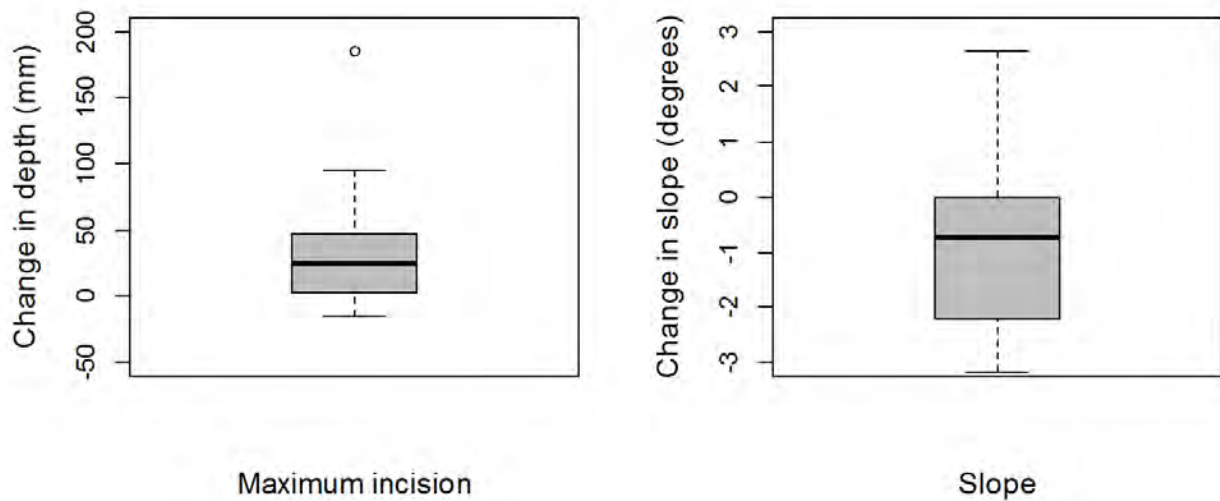


Figure 3: Change in maximum trail incision and slope of the firebreak after the Monkey Rock Speed Run (NB: Changes were caused erosion from runoff rather than bikes).



Figure 4: (a) Incisions from bikes were minimal, and restricted to the firebreak rather than the adjacent Bibbulmun track. (b) Erosion and sedimentation from rainfall runoff was far more evident than bike incisions. (c) Vehicle tracks were also evident. (d-f) Some trees along the course had recently lost bark, although the cause is unknown.

Discussion

The results of this survey indicate that the Speed Run had minimal impact on the Monkey Rock area. The sample locations on the granite outcrop generally fell within the course-boundary (which was laid out after baseline sampling) and there was no observable damage to the mosses and lichens in those areas (Figure 1). The course avoided or bridged gullies and incisions where mosses and lichens were most prevalent, following a similar path to that used by site-seers year round. While this path likely had greater coverage of mosses and lichens historically, the bikes have had little to no impact on the area in its current state. The only obvious disturbance to the moss was caused by a kangaroo or wallaby, indicated by a footprint (Figure 2a). The course did pass over a narrow patch of lichen approximately 1m south of quadrat two; this area was not part of the initial quadrat collection so there is no before-photo for comparison, but there did not appear to be any damage. If future monitoring is undertaken for subsequent events, this site should be included in the photo-quadrat collection.

A faint trail of dirt from bike-tyres was still evident on the outcrop four days after the event, despite heavy rain (Figure 2b). This will likely be washed away shortly, but it does highlight the potential spread of soils and soil-borne pathogens (i.e. dieback) by the bikes and spectators. Anti-dieback measures taken by the event organisers (see introduction) have mitigated this concern, and should be continued if the event is held again.

Using the firebreak rather than the Bibbulmun track for the lower section of the course removed the potential for bikes damaging the track itself. There was no significant damage to the surrounding vegetation in any of our firebreak transects, either in the form of trampling or bike-scarring on trees. Outside of our transect areas bark had been removed from 3-4 trees, but this could have been caused by natural process (e.g. animals or weather) and was only noticed on trees at the very edge of the firebreak (Figure 4 d-f). It appears that the defined track has prevented most if not all damage to the surrounding vegetation. While the change in maximum incision depth and slope of the course were significant, this was clearly due to runoff from erosion, as well as faint car-tyre tracks. There was an obvious incision where the bikes turned off of the granite section prior to transect one, however being on the firebreak there is no expected ecological impact.

Recommendations

The DMBC appear to have minimised any impact from the Speed Run on the Monkey Rock area. The measures put in place and the course used for the event seem appropriate if the event is held again. Monitoring of future events should focus on the granite outcrop as this is the area with the greatest conservation value. Negative ecological impacts on the firebreak itself are not likely as the area is maintained for fire management and access purposes. Additionally, the organisers restricted bikes and spectators to well defined paths, and their potential impacts are far exceeded by natural processes such as erosion. It may still be worthwhile assessing trampling and tree-condition at the firebreak-woodland edge, particularly if the Speed Run grows and attracts a larger number of spectators. Dieback management is clearly a priority in the area, and the measures taken by the DMBC should be used again for future events.

Acknowledgements

Thanks to David Schober and Donna Sampey from the Shire of Denmark, and Nathan Devenport from the Denmark Mountain Bike Club, for their assistance during the initial site visit and providing relevant literature. Thanks to Kara Pot for assisting with the field work.

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