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GEOTECHNICAL

Tauranga District Council
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Tauranga

7 August 2020
Avalon Project #20149

For the attention of s 6(c) - Maintenance of Law Natural Environment Advisor (Mauao)

Dear s 6(c) - Maintenance of Law

Mauao Slopes; Monitoring Report for August 2020

The six monthly rock bluff survey benchmark monitoring and site geotechnical walkover was due in April 2020. Due to the coronavirus pandemic the work could not be carried out until the 6th August.

TCC's staff member managing Mauao is now s 6(c) - Maintenance of Law Natural Environment Advisor (Mauao) s 6(c) - Maintenance of Law and s 7(2)(a) - Privacy Avalon's Engineering Geologist, met on 6th August and reviewed the history of rockfall monitoring work and reports on Mauao.

Detailed investigation of Mauao's slope hazards was first prompted following widespread fire damage in January 2003. Avalon's investigations have included rockfall and slip hazard and risk assessments in response to fires, earthquakes, floods, rockfalls and human activities. All these events, investigations and responses were documented and reported to TDC. This has allowed Avalon to build up an understanding of the rockfall processes and risks on Mauao.

2003 Report on Mauao Rock Slopes & Rockfall Hazards
2004 Report on Mauao Rockfall Hazards Risk Assessment & Management
2004 Report on Mauao Slopes Earthquake Damage & Revised Risk Assessment
2005 Report on Mauao Slopes Zone 6 Rockfall Hazard & Risk Assessment
2005 Report on Flood Danmage & Slope Remedial Works
2006 Report on Rockfall & Landslide Risk Review
2003 to 2020 Letter reports in response to rockfall events
2003 to 2020 Letter reports on biannual routine slope monitoring

1. Rockfall since previous monitoring

There has been no rockfall reported to the ranger's office or campground since the previous monitoring. The walkover did not find any indications of recent rockfall.

2. Bluff survey

The benchmark EDM survey found no significant movement on those high bluffs which are monitored.

3. Comparison of photographs from 2005 and 2020

The following photographs illustrate the revovery of vegetation and erosional changes from 2005 (2 years after the fires) to the present day.

The low vegetation, shrubs, flax etc, is generally benefifial as far as rock stability is concerned. The root masses bind the soil and the vegetation itself traps and helps stabilise any moving small surface rocks.

Tree roots however have pro's and con's; they help bind the soil but where roots penetrate joints and fractures in the rock they can create "root jacking" pressures which open up the joints and hence decrease stability.

The vegetation now conceals much of the obviously marginelly stable surface rock, giving the observer much less impression of the loose surface rock hazards present.

3.1 Location B 2005 (right) vs 2020 (left)

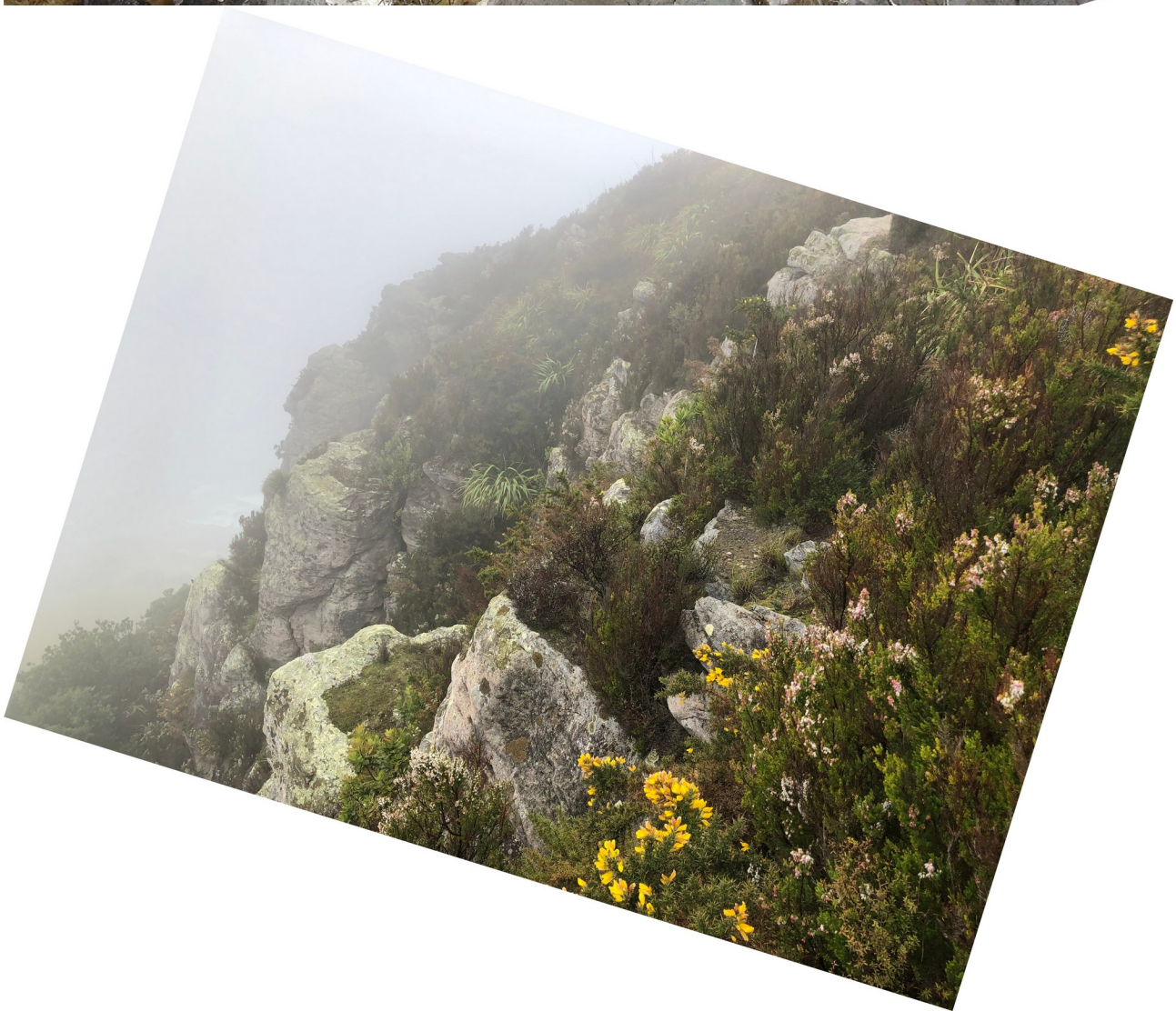
3.2 Location C 2005 (top) vs 2020 (bottom)

3.3 Location C 2005 (top) vs 2020 (bottom)

3.4 Location D 2005 (top) vs 2020 (bottom)

3.5 Location D 2005 (top) vs 2020 (bottom)

3.6 Location E 2005 (top) vs 2020 (bottom)



3.7 Location F 2005 (top) vs 2020 (bottom)

3.8 Location G 2005 (top) vs 2020 (bottom)

3.9 Location G 2005 (top) vs 2020 (bottom)

3.10 Location I 2005 (top) vs 2020 (bottom)

3.11 Location J 2005 (top) vs 2020 (bottom)

3.12 Location J 2005 (top) vs 2020 (bottom)

3.13 Location M 2005 (top) vs 2020 (bottom)

4 Loose rock identified on the bluffs above the Oruahine track.

In 2017 Avalon provided a team of two technicians to assist with vegetation survey work above the Oruahine track. During that work the team came across a number of unstable areas of rock face.

Some larger unstable boulders were found, indicated in the following photos. These could not be scaled at the time with the resources available. We recommend these hazards be scaled. Track security would be required.

Loose rock identified on the bluffs above the Oruahine track.

5 Moturiki Island

Whilst on a recreational visit to Moturiki island one of Avalon's technicians identified evidence of rockfall and persons rock climbing on a face with a number of obviously marginally stable areas.

Public attempting to climb the wall with multiple hazards above

Evidence of recent rockfall was found immediately below

We would recommend a close inspection and light scaling operation to reduce the rockfall hazard in this vicinity

If you have any queries or any rockfall is reported please don't hesitate to contact me at any time.

Regards

s 7(2)(a) - Privacy
B.A. M.Sc. Engineering Geologist.