



Reavers Lane & Brewery Creek Debris Flow & Rockfall Loss Modelling

What will the losses look like if we manage future development through land-use policy or engineering options?

Queenstown Lakes District Council (QLDC) proposed four future development options for the study areas: status quo, managed, reduced and engineering options. RiskScape was used to understand what the direct losses could be by 2120 if each option was adopted.



Figure 3 summarises the results for each of the modelled debris flow events at the Reavers Lane study area. The results show:

- > 2020 baseline losses of between \$13.5M to \$39.2M
- > the highest losses occur from the status quo option which range from \$19.1M to \$132.5M
- > the manage option losses range from \$10.3M to \$66M
- > the reduce option losses range from zero to \$20.9M.

Notably, while all reduce scenarios estimate a reduction in losses, this study has not assessed the cost of implementing the policy or engineering options (cost/ benefit analysis).

Figure 4 summarises the results for each of the modelled debris flow events at the Brewery Creek study area. The results show:

- > 2020 baseline losses of between \$1.1M to \$14M,
- > the highest losses occur from the status quo option which range from \$29.6M to \$122.2M
- > the manage option losses range from \$1M to \$41.6M
- > the reduce option losses range from zero to \$10.6M



Figure 3: RiskScape direct building damage results for debris flow events at Reavers Lane for each future development option.



Figure 5 shows the total losses estimated for modelled rockfall events at both study areas. All modelled policy options result in a reduction in direct losses when compared to the 2120 status quo policy option.

Results summary

For debris flow hazards:

- > the status quo option increases direct losses for all scenarios modelled due to increased exposure of buildings
- > the manage option reduces direct losses for all events at both locations when compared to the 2120 status quo option
- > the reduce option decreases building losses at both locations for all hazard scenarios due to a reduction in exposed buildings in high hazard locations
- > the engineering scenarios (modelling the effect of a debris fence) reduces building losses for all events at both locations when compared to the 2120 status quo option.

For rockfall hazards, all modelled policy options result in a reduction in direct losses when compared to the 2120 uncontrolled policy option.

Figure 4: RiskScape direct building damage results for debris flow events at Brewery Creek for each future development option.







MILLIONS

Rockfall damage to house following Christchurch Earthquake 24 February 2011. Photo credit: Graham Hancox GNS Science.

Debris flow in Matata, Bay of Plenty 19 May 2005. Photo credit: Whakatane Beacon.

Figure 5: RiskScape direct building damage results for modelled rockfall events at Brewery Creek for each future development option.

