MANAGING POST-FIRE SOIL EROSION IN THE MOUNT LOFTY RANGES, SOUTH AUSTRALIA

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Introduction

Post-fire soil erosion can alter ecosystems by affecting water quality, soil formation and general landscape characteristics. Management options to mitigate post-fire soil erosion depend on the geomorphology, fire regime, season and rainfall characteristics. This research focuses on various case studies of differing fire types in the Southern Mount Lofty Ranges (SMLR) (Fig 1).

Wildfires

Post-fire sediment movement is influence by hillslope morphology. Managers (Fig 3) can predict the likely areas of concentrated post-fire soil erosion and deposition with a good working knowledge about hillslope morphology.


Prescribed fires

Sediment movement following prescribed fires depends on the fire severity, slope angle and rainfall. Based on assessment of 10 prescribed burns in the SMLR, over 50% of the 550 sites indicated post-fire sediment movement. Reducing the fire severity from high to low will reduce the likelihood of sediment movement by 52%. A simple visual assessment framework has been developed to monitor post-fire erosion.


End User Statement

Danni Boddington, Fire Manager, SA Water

Managing post-fire erosion is critical to healthy drinking water. SA Water has incorporated this CRC research into our ongoing management of fires in water reservoirs.

Key findings

• Post-fire soil erosion is a natural process in the Southern Mount Lofty Ranges that can be influenced by differing fire management practices.
• Patterns of sediment movement are influenced by hillslope morphology.
• In the SMLR altering the fire severity from low to high during prescribed burns will increase the probability of sediment movement by 52%.
• Sediment barriers will reduce but not prevent post-fire charcoal-rich sediment and debris reaching water reservoirs after a 1 in 5 year rainfall event.