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Management of agricultural activities in karst environments: A case study of the Gunns Plains karst.

Serena Benjamin

Abstract:

The Gunns Plains karst, located in northwest Tasmania, is formed in Ordovician limestone and extends over 36 km^2. It contains significant karst phenomena at system, landform and landform contents levels. These include horizontal and vertical cave systems, stream sinks, sinkholes, springs, cave deposits, clastic sediments, bone deposits and karren. The karst is largely on privately owned farmland but land tenure also includes areas of State Forest, Crown land, a State Reserve and a Private Forest Reserve. Given the significance of some of the karst features and their occurrence on private land, agricultural management practices are an important consideration for the karsts' future protection. Though karst is generally perceived to be a fragile environment, some elements of the karst landscape may be more robust than others with sustainable land use practices needing to be prescribed for each particular karst area.

This presentation covers the results of an Honours project conducted over a ten month period from February 2004 to November 2004. An holistic approach was adopted in order to investigate potential impacts of agriculture on the karst environment. Thus, historic land use change, sinkhole development and landslide activity were assessed using a series of aerial photographs dating from the late 1940s to the present. Ground surveys looked for further evidence of sinkhole development and landslide activity as well as investigating rates of soil loss by measuring the exposure of solutional microforms that originally formed beneath the ground surface (karren) and have been exposed by subsequent soil erosion. Investigations of the impact agricultural activities have had on the subterranean environment involved observation of eight karst caves. Because patterns of groundwater flow in karst can be difficult to predict, a groundwater tracing experiment was also undertaken to enable impacts within a defined sub-catchment to be considered in greater detail. Furthermore, findings from the above investigations were supplemented by anecdotal evidence from property owners.

The study found that the Gunns Plains karst has been subjected to significant amounts of change as a result of past agricultural practices. While these impacts may persist, the adoption of more suitable land use practices by property owners has seen these impacts minimised. Further changes in land management practices could procure improved outcomes for karst management.