The Gwembe Coal Such as the Sandstones are Well Known, However, the Characteristics of Finer-Grained Facies are Poorly Known

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A Case Study in Landslides and Cultural Heritage Sites: The Significance of Head-Smashed-In Buffalo Jump, Alberta, Canada.

The archaeological site of Head-Smashed-In Buffalo Jump (HSI), located in southwestern Alberta, Canada provides an exceptional example of the relevance of landsliding in the formation of a cultural heritage site.

Recognized as a World Heritage Site, HSI provides a 6000 year record of prehistoric human activity by Native North Americans who focused on animal procurement strategies that involved the stampeding of plains bison over precipitous bedrock cliffs (hence a bison jump). The site lies at the foot of 10 metre high cliff of exposed Tertiary sandstone (Porcupine Hills Formation) which extends for several kilometres in a N-S orientation.

Since deglaciation some 12,000 years ago, the heavily jointed sandstone (trend of 049 degrees) has been subjected to extensive erosion by mass movement processes including toppling, sliding and slope wash. Periodic catastrophic topples and slides and ongoing gradual slope wash have occurred throughout the Holocene (ca. 20 metres of deposit) including the entire period of human occupation and have resulted in the formation of a thick apron of sediment at the cliff base consisting of intercalated beds of coarse rubble and finer matrix, artifacts and animal bones. Radiocarbon dates of 5700 years BP from

bison bones at depths of 10 meters indicate that bedrock and sediment accretion at the base of the cliff averages 1.5 centimetres per year for the Holocene. The various types of mass movement activity at this location have contributed significantly to the formation and preservation of this important site.