South Wales RIGS Group Site Record
RIGS Description

SECTION A

General	South Wales
Site Name: Darren – Cwmyoy Landslide	**File Number:** AH_02
RIGS Number: 725	**Surveyed by:** AJ Humpage
Grid Reference: SO 29910 23370	**Date of Visit:** 9 February 2011
RIGS Category: Scientific	**Date Registered:** Unknown
Earth Science Category: Geomorphological, Sedimentological	
Site Nature: Pasture farmland and rough grazing	**Documentation prepared by:** AJ Humpage
Unitary Authority: Monmouthshire CC	**Documentation last revised:** 19 August 2011
OS 1:50,000 Sheet: 161	**Photographic Record:** See images attached to this report
OS 1:25,000 Explorer Sheet: OL 13	
BGS 1:50,000 Sheet: 214 (Talgarth)	

RIGS Statement of Interest: This site forms part of a network of important scientific sites within the South Wales RIGS area associated mass movements

The Darren and Cwmyoy landslides are extensive and adjacent and, which exhibit a whole suite of mass movement mechanisms ion bedrock and near surface deposits which can be recognised based on the classification by Varnes (1978). Extensive landslide deposits were mapped by BGS (2004).

The Darren landslide is defined by a high, near vertical backscar over 100m in height with a face composed of alternations of sandstones and siltstones of the Devonian – age St Maughans Formation. The very top of the backscar, and the hill above, is in the Senni Formation. The landslide occurred as a non-circular rotational failure – a slump and within the body of the slump there are several secondary scarp features.

The Cwmyoy landslide, at the intersection of the minor tributary valley of Cwm Iau with the main valley, exhibits large scale translational failure, possibly along bedding planes below which are a series of smaller scale slumps and rotational failures which have disrupted the foundations of Cwmyoy church, resulting in the tower and component sections of the nave being at different angles to each other. On the eastern flank, a series of shallow-depth, translational failures associated with near surface water movements are visible.

Both landslides remain active to the present day and the complexity and extent of the two landslides are of scientific and historical interest. To present, no material from these landslides have been dated, although the damage to the church acknowledges ongoing movement since at least the mediaeval period.

Geological setting/context:

The landscape evolution history of the Black Mountains is not well understood, as although extensive glacial deposits have been mapped in the dip-slope valleys of the Honddu, Grwyne Fawr and Grwyne Fechan (BGS 2004), there is no evidence of mid-Wales ice incursion over the northern escarpment of the Black Mountains, or conclusive evidence of glaciation of the Black Mountains during the last (Devensian) Ice Age, although Lewis and Thomas (2005) reported kame topography around Llanbedr in the Grwyne Fechan and glacial deposits were mapped on the basis of an aerial photograph interpretation reconnaissance survey in 2002 (BGS 2004).

Lewis and Thomas (2005) argued that it was glacial oversteepening of the valley sides which resulted in instability giving rise to the proliferation of large landslides in the Honddu valley and some of its tributaries, however recent work (Thomas and Humpage 2007; Humpage in prep) has begun to cast doubt on the glaciation of the Black Mountains during the Late Devensian, although it is acknowledged that the area was probably over-ridden by ice during earlier glacial stadials.

The Darren and Cwmyoy landslides are therefore probably a response to weathering and weakening of bedding planes over a long period and may include not only the last Ice Age but also the previous Ipswichian interglacial period. A combination of warm temperate and cold periglacial weathering processes, combined with a regional dip into the valley, would make the west-facing valley side more prone to instability along bedding plane surfaces (dip is generally 6-8^{o} to the south-west) without the necessity to invoke glacial oversteepening during the Devensian. The upper part of the Cwmyoy landslide is dominated by a large detached translational block in its upper half. However, without absolute dating evidence to confirm the age of the failures, their age and origin remains uncertain.

Similar large scale landslides which lay just beyond the Devensian ice limit are recorded elsewhere in the British Isles, such as Mam Tor in Derbyshire (Skempton et al 1989; Rutter et al 2003), which has an age of only around 3,600 years, and this is perhaps indicative of the long periods of time needed in areas which remained unglaciated for weathering to decrease slope stability.

As well as large-scale slumping and bedding plane movements in bedrock, there are shallow-depth expressions of failure on the Cwmyoy landslide with slumping below the church and small translational slides on the eastern flank at Penywern Farm. These small scale movements are associated with near surface water movements and in part are a consequence of ruptured land drains raising porewater pressures in the low permeability soil (Humpage 1999).

References:

British Geological Survey (2004). *Talgarth. England and Wales Sheet 214.Solid and Drift Geology. 1:50,000.* British Geological Survey, Keyworth, Nottingham.

Humpage, A.J. (1999). *Shallow-depth, low Angle Planar Sides on Slopes in Periglacial Environments: an Arctic Analogue for Pleistocene Britain*. Unpublished PhD Thesis. University of Wales, Cardiff.

Humpage, A.J. (in prep). *Geological Assessment of Llanvihangel Crucorney Moraine SSSI*. BGS Commissioned Report.

Lewis, C.A. and Thomas, G.S.P. (2005) The Upper Wye and Usk Regions. In: CA Lewis and A.E. Richards (Eds). *The Glaciations of Wales and Adjacent Regions*. Logaston Press, Logaston, Herefordshire.

Rutter, E.H., Arkwright, J.C., Holloway, R.F. and Waghorn, D. (2003). Strains and displacements in the Mam Tor landslip, Derbyshire, England. *Journal of the Geological Society, London*, **160**, 735-744.

Skempton, A.W., Leadbetter, A.D. and Chandler, R.J. (1989). The Mam Tor landslide, North Derbyshire. *Philosophical Transactions of the Royal Society of London,* **A329**, 503-547.

Thomas, G.S.P. and Humpage, A.J. (2007). Llanvihangel Crucorney,. In: S.J. Carr, C.G. Coleman, A.J. Humpage and R.A. Shakesby (Eds). *Quaternary of the Brecon Beacons: Field Guide*. Quaternary Research Association, London.

Varnes, D.J. (1978). Slope movement types and processes. In: Schuster R.L. and Krizek R.J. (Eds.). *Landslides, analysis and control*. Transportation Research Board Special Report No. 176, National Academy of Sciences. p.11–33.

SECTION B

PRACTICAL CONSIDERATIONS:
Please score Accessibility and Safety Red Amber or Green

Accessibility:			X
Comment: Accessible where crossed by public rights of way allowing features to be viewed. Otherwise, permission will be required.			
Safety:		X	
Comment: Farmland and rough grazing. Backscar of the Darren landslide and Cwmyoy landslide prone to occasional rockfalls.			

Conservation status:

Part of the Darren landslide including all the backscar is within the Black Mountains SSSI, otherwise there are no known conservation designations on this RIGS.

OWNERSHIP/PLANNING CONTROL:

Owner/tenant: Unknown / various including BBNPA

Planning Authority: Brecon Beacons National Park Authority

Planning status/constraints/opportunities: There are no known planning constraints or opportunities

CONDITION, USE & MANAGEMENT:

Present use: Farmland

Site condition: Mainly open pastureland/ rough grazing

Potential threats: None known at present

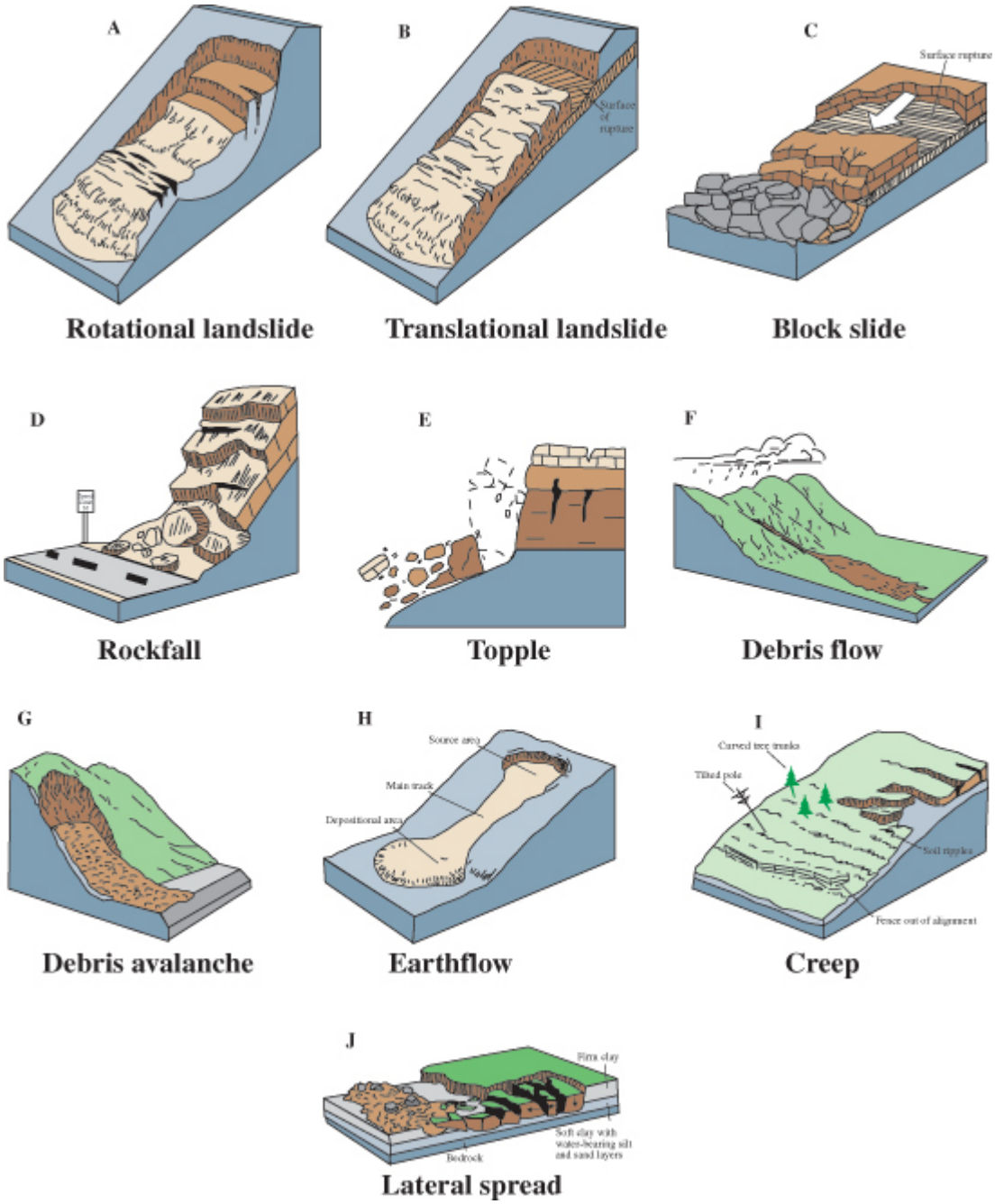
Site Management:

SITE DEVELOPMENT:

Potential use (general): detailed scientific research and geomorphological mapping, would benefit this site

Potential use (educational): Good site to view and explain active landslides and mass movement processes

Other comments:



Simplified Varnes (1978) classification – elements of many of these slope failures occur in the Darren – Cwmyoy landslides, highlighting the complexity of this RIGS.

Photographic Record

The Darren landslide - view looking east across the Vale of Ewyas from the Bloodstone

The upper part of the Cwmyoy landslide with large detached translational block – a probable bedding plane failure. View looking south-east.

The relationship between the Darren (left) and Cwmyoy (centre) landslides

Backscar of the Darren landslide

The Darren landslide viewed from the road leading to Llanthony. Wooded area below the backscar is the accumulation area of this large complex landslide which incorporates non-circular rotational failure and toppling.

Backscar of the Darren landslide

View showing the distortion of Cwmyoy village church caused by ongoing movement of the Cwmyoy landslide. Note buttresses supporting the walls. As each part of the church was built, attempts were made to counter previous movements, resulting in a building with different parts at different angles. *Photograph: A. Humpage*

Active shallow translational failures forming distinct features on the slope in the centre of the view. The large mound left of centre on the skyline is the detached translational block part of the main Cwmyoy landslide. *Photograph: A. Humpage*

Shallow translational failures forming “hummocky ground” at Penywern Farm, Cwmyoy landslide
Photograph: A. Humpage

Extensional tension gashes at the head of a shallow translational failure, Penywern Farm, Cwmyoy landslide. *Photograph: A. Humpage*