

Extended abstract No. 63

SURFACE PROFILE CHANGE AT CORS FOCHNO (BORTH BOG), WALES, UK

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SUMMARY

Cors Fochno (Borth Bog) is an almost pristine, active estuarine raised peatland on the west coast of Wales which has a high level of National and International protection. There has been a long history of peripheral human intervention mainly related to peat extraction and drainage. From the 1970s many of the drainage channels were blocked and using a rocky outcrop called Llwyn y garreg as a baseline the shrinkage and subsequent recovery of the peat level has been followed suggesting that the blockage of the drains has had a positive effect on the surface level of the bog.

KEY WORDS: Cors Fochno, peat shrinkage, drain blocking

INTRODUCTION

Cors Fochno (Borth Bog) lies on the southern side of the Dyfi estuary on the west coast of Wales. Originally covering some 2000ha this peatland has been reduced by human activity to a core of some 653ha which are designated a Special Area of Conservation (SAC), comprise part of the only UNESCO biosphere reserve in Wales, part of a Ramsar Convention site, part of a Special Protection Area (SPA), a National Nature Reserve and Site of Special Scientific Interest (SSSI). (Figures 1 and 2)

The dome is an undulating mosaic of hummocks and hollows supporting classic oceanic raised bog vegetation (Fig.3). The reason given for its designation as an SAC is that it is the largest expanse of primary near-natural raised bog in an estuarine context in the United Kingdom and one of the most intact of its type in Europe. Within its extensive area of patterned mire are occasional hummocks of *Sphagnum fuscum* and more rarely *Sphagnum imbricatum* ssp *austinii* with hollows of *S. pulchrum* containing *Drosera anglica*, *Andromeda polifolia*, *Rhynchospora alba* and rarely *Rhynchospora fusca*. There are extensive areas of *Myrica gale* and on the maritime fringe *Schoenus nigricans* all contributing as distinctive features of sites in an England and Wales context.

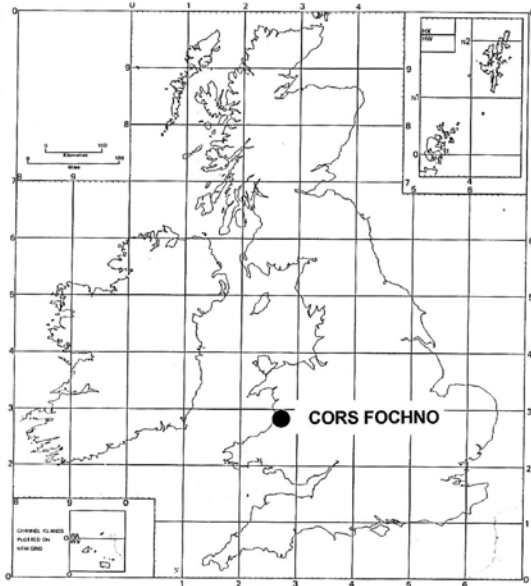


Figure 1. Location of Cors fochno

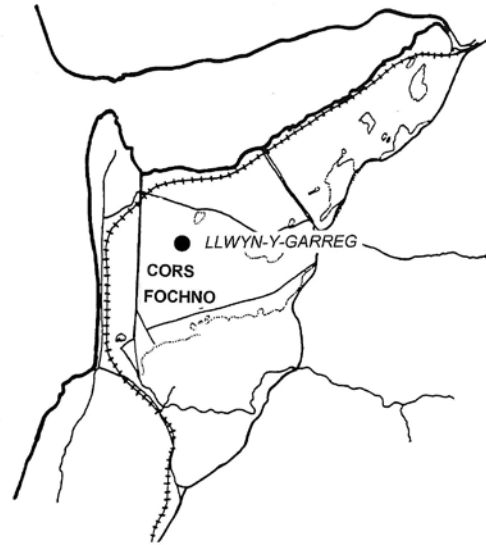


Figure 2. Llwyn y garreg within Cors Fochno

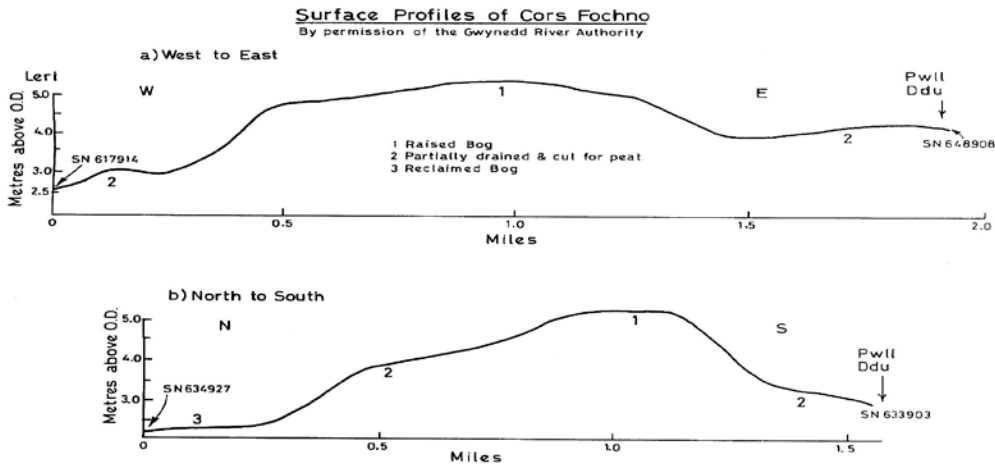


Figure 3. Surface profile of Cors Fochno from 1960s data

In spite of its pristine core, the periphery of the bog in particular, has been subject to human interference over a considerable period of time. Iron Age/Roman lead smelting activity took place south of Llancynfelyn and in 2004 a medieval trackway associated with lead mining was exposed on the eastern side of the bog and mine shafts around Llancynfelyn and Tre'r ddol were active into the nineteenth century.

The site was recorded at about the same time as one of the three most important sites in Wales for peat extraction, an activity which continued into the early twentieth century with the aid of a steam powered peat cutter, the extent of which activity is still clear from

aerial photography. Also in the nineteenth century, a road (B4353) was constructed across the northern end of the bog opening up some 1300ha peatland and estuarine land for farming and north of this road by 1952 some 90km of drainage ditches were present. South of this road, which is the area of this study, the western side of the bog was being drained by 1790 and the River Leri had its course diverted to its present northerly route about the same time clearly influencing hydrology. There was an intensive period of bog drainage between 1813 and 1820 involving even the raised core of the site and drains continued to be constructed on site subsequently with the last major phase of drainage between 1939 and 1970 initially associated with Second World War “war effort” and later by efforts to convert the dark peat soils to potato production, an initiative which failed (Figure 4).

Since the 1970s the Nature Conservancy Council and subsequently the Countryside Council for Wales have acquired more land in the area and have systematically blocked existing drainage ditches on the western and southern sides of the bog.

Extent of Drainage on Cors Fochno in Nineteenth Century

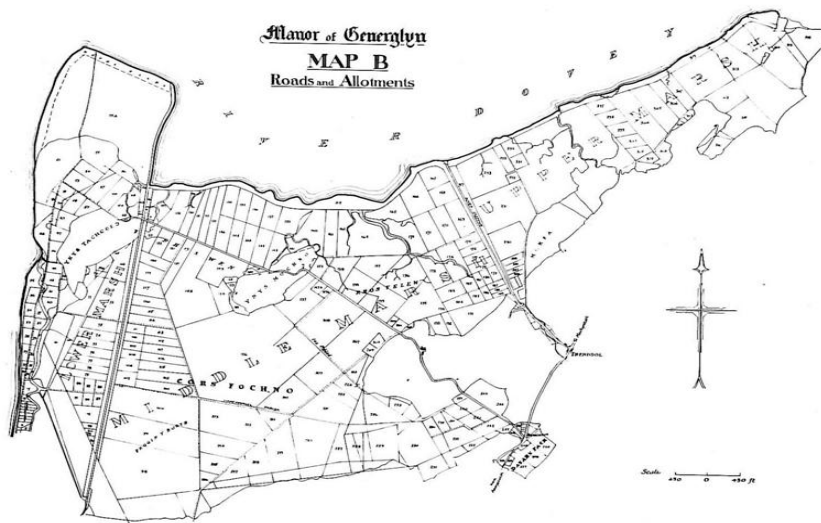


Figure 4. Extent of drainage on Cors Fochno in the nineteenth century.

## PEAT SHRINKAGE STUDY – BASELINE AND METHODOLOGY

The catastrophic effects of peatland drainage have been well documented in the UK at only a few locations the best known being the Holme Fen post in eastern England which recorded a peat surface drop due to shrinkage from 1848 (Hutchinson, 1980). In Wales shrinkage can be qualitatively observed where peatlands are drained e.g. for forestry but quantitative data requiring measurements over time are generally not available.

Unevenness of the landscape especially of the northern end of Cors Fochno have resulted in several rocky outcrops emerging as “islands” in the general peatland hence their general Welsh prefix of Ynys (Ynys Tachwedd, Ynys Fergi, Ynys Las). West of the centre of the bog at Grid Reference SN 623918 is another small rocky outcrop in this case called Llwyn y Garreg (stony grove). (Figure 5)



Figure 5. Air photograph of Cors Fochno showing Llwyn y garreg 2010.

Yapp (1911) published a photograph of the site noting “it affords a striking illustration of the effect of soil moisture in determining the distribution of plants”. In Yapp *et al* (1916) Llywn y garreg is described as “A prominent feature of the moor is a small wooded outcrop of rock which rises like an island a few feet above the general level of the bog” and more specifically “the summit of Llwyn y garreg is only some five feet (c1.5m) above the general level of the moor”. This then gives an approximate baseline from which to measure subsequent change in the surface profile of the bog in this vicinity as this measurement pre-dates the last major phase of drainage.

The opportunity was taken to survey fixed transects away from the highest point of Llwyn y garreg in 1972, 1996 and 2010.

## RESULTS

The results are shown in the accompanying diagrams and indicate that between 1911 and 1972 there was considerable shrinkage in the general level of the bog which in 1996 and continuing to 2010 shows progressive recovery of surface level. The level to the south appears to exceed the hypothetical 1911 level by about half a metre but *Molinia* hummocks in this area create a very uneven surface for survey but Fig 2 shows the close proximity of impeded water flow which could have influenced re-wetting of the peat. The 1911 photograph shows bog pools west of Llwyn y garreg and examination of recent air

photographs show inundation due to drain blockage quite close to the mound. (Figs 5, 6,7,8)

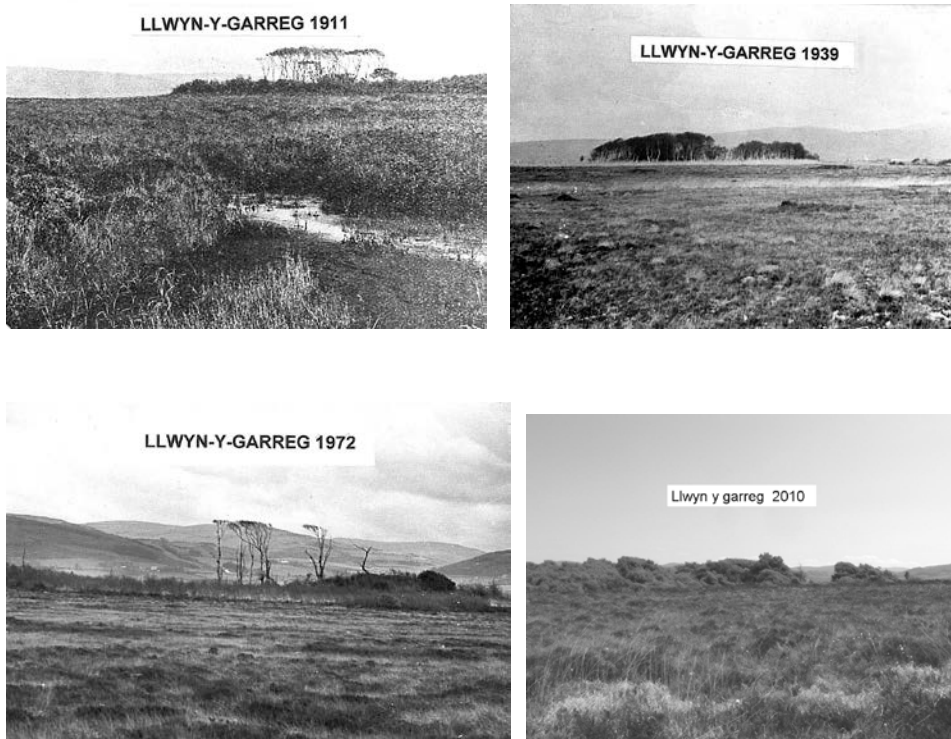


Figure 6 a,b,c,d Four photographs of Llwyn y garreg through time

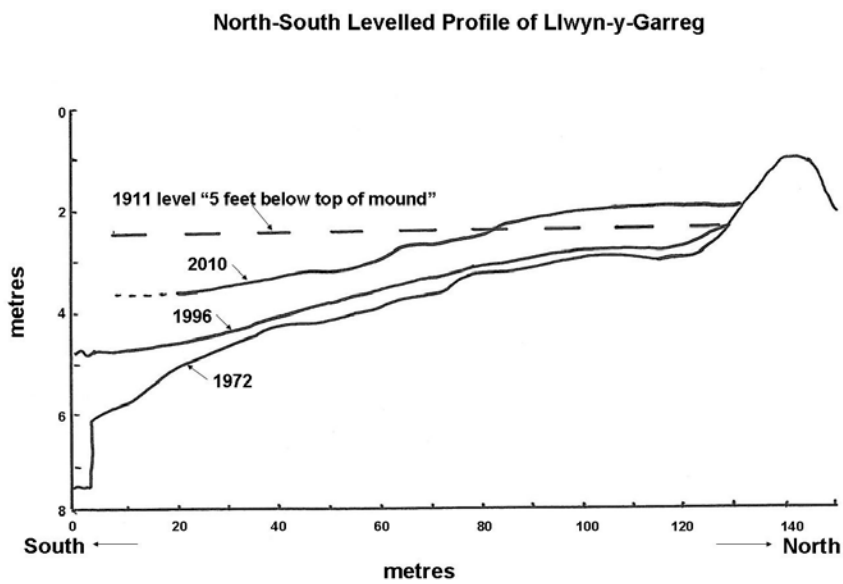


Figure 7 North-South levelled profiles of Llwyn y garreg 1911, 1972, 1996, 2010

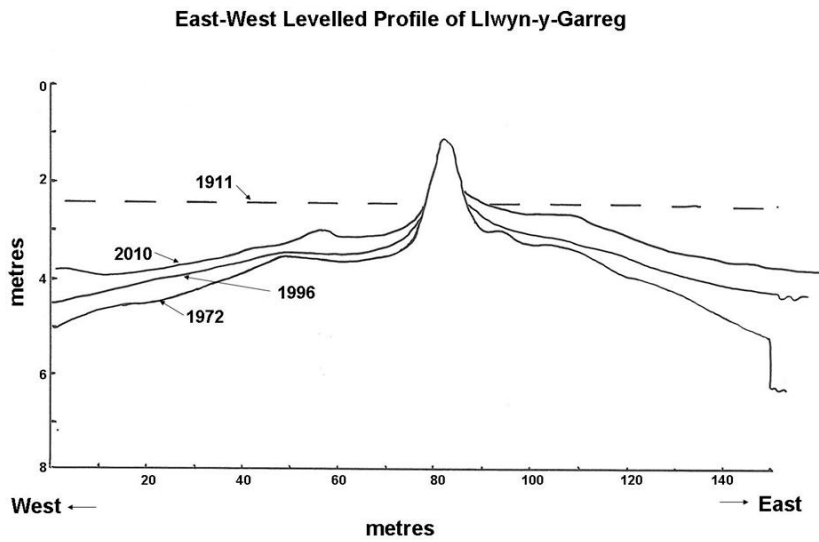


Figure 8 East-West levelled profiles of llwyn y garreg 1911, 1972, 1996, 2010

## REFERENCES

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