Exmoor: a Shallow Peatland

Since the last ice-age, humans have been using and altering the moorlands of Exmoor. Peat cutting by hand has been practised on Exmoor since medieval times, and features indicate that large amounts of peat have been removed for domestic use[1]. From the 1820s the Knight family constructed a dense network (approximately every 20 m) of hand dug ditches (about 0.5 m wide by 0.5 m deep) (Figure 1) to reclaim the high moors for arable production[2] resulting in 618 km of drainage ditches[3] (Figure 2). Additional larger ditches (>1.5 m wide) were machine dug between the 1960s and 1980s to drain specific areas such as springs[4]. The moorlands have also been subject to burning, in a further attempt to improve pasture for grazing. Collectively, these management practices led to a drying out of the peatlands and an increase in the dominance of purple moor grass (*Molinia caerulea*).

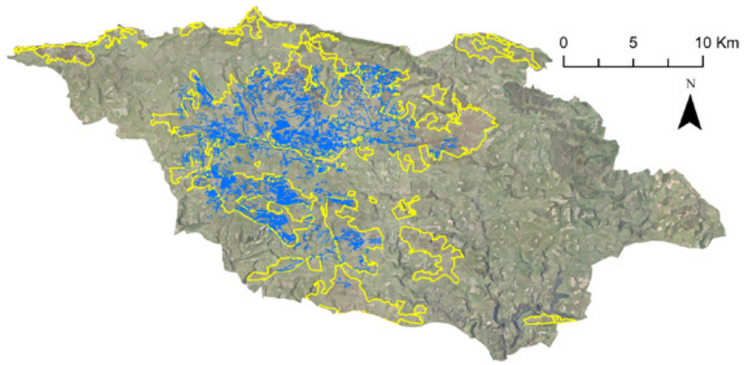

Figure 2 Exmoor National Park showing the fragmented moorland areas (yellow) and mapped drainage features (blue).

Peat cutting on Brendon Common in the 1990s.
Image courtesy of Rob Wilson-North.

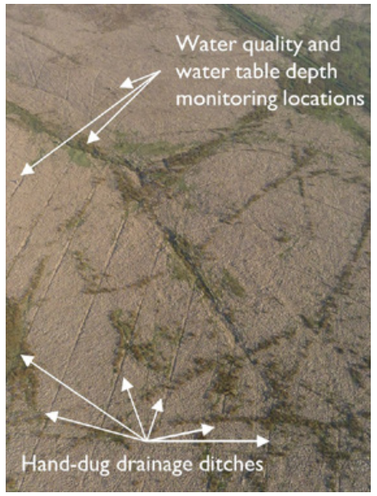

Figure 1 Photograph from an Unmanned Aerial Vehicle showing the closely spaced hand-dug drainage features typical of Exmoor and water quality and water table depth monitoring locations at Aclands.

The cool (minimum of 2 °C in February, rising to 18 °C in July[5]) and wet (1353 mm per year) conditions on the uplands of Exmoor enable peat to form. However, peat across Exmoor is relatively thin, with 53 km^2 (5300 ha) of the 65 km^2 (6500 ha) of blanket bog less than 30 cm thick[6,7].

Monitoring the effects of restoration has focused on two small headwater catchments of the River Barle, within North Exmoor Site of Special Scientific Interest. They are located between 380 and 465 m above sea level. These catchments, Aclands (Figure 3) and Spooners (Figure 4), were chosen to be representative of the general peatland conditions found across Exmoor. Both catchments contain vegetation typical of mire and wet heath communities, such as *Sphagnum* spp. and cotton grasses (*Eriophorum* spp.) but are dominated by purple moor grass (*Molinia caerulea*). The catchments are currently in use as rough grazing.

Aclands and Spooners were restored, by ditch blocking with peat and wooden dams, in spring 2013 and 2014 respectively (Figure 5).

Additional monitoring occurred at Long Holcombe along a gradient between wet bog vegetation (*Sphagnum* spp. and cotton grasses (*Eriophorum* spp.)) with peat depths in excess of 0.5 m, to dry purple moor grass (*Molinia caerulea)* dominated grassland with peat depths of less than 0.2 m.

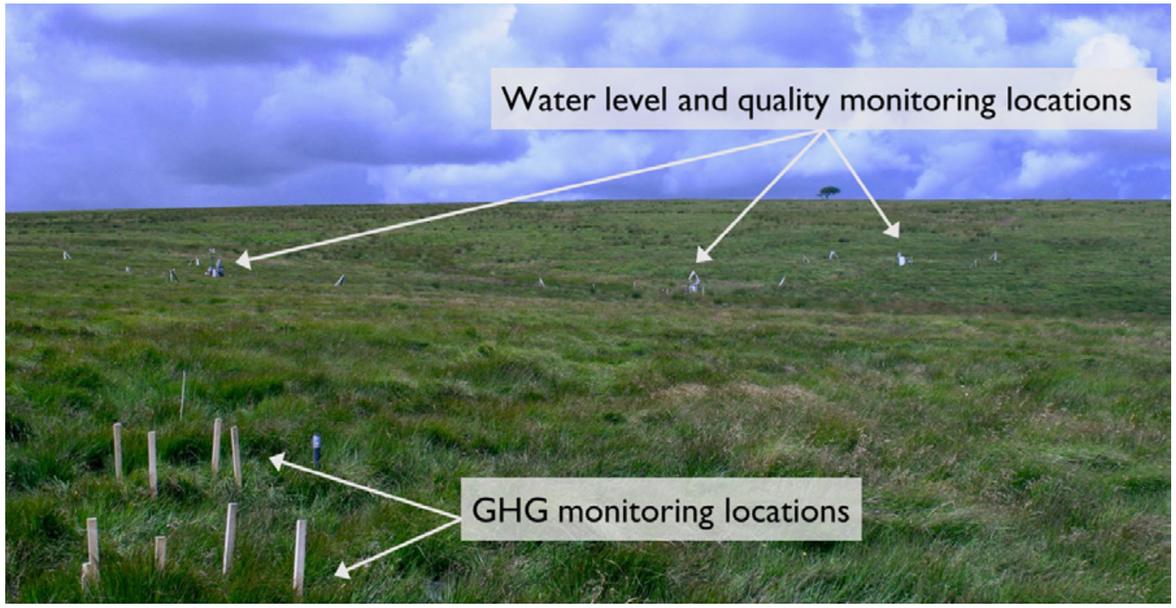

Figure 3 Summer in the Aclands catchment with a greenhouse gas monitoring (GHG) location in the foreground and water level and water quality monitoring across small (left), large (middle) and medium (right) ditches in the background.

Figure 5 Post-restoration, peat dams create pools of water at Spooners.

Figure 4 Unmanned Aerial Vehicle borne imagery of the dry purple moor grass (*Molinia caerulea*) dominated Spooners catchment, post-restoration.

REFERENCES

The appendices are available to view at **www.exeter.ac.uk/creww/research/casestudies/miresproject**

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