

Russell Anderson's report on Leadburn Block

Visited on 4th and 11th December 2013

Introduction

The research area was planted in 1966 and 1976. This block is on an area of raised bog at 280 m elevation on the watershed between the North Esk and Tweed catchments. It was part of a much larger block of forest, the rest of which was sold to the Leadburn Community Woodland Group around 2006. Leadburn Wood as it is now known is managed partly as young woodland and partly as a raised bog restored by the community group several years after first rotation forest was harvested in 2001. The 'community bog', which lies to the west of the railway running SW from Leadburn Junction, gives an example of what bog restoration can achieve at this site.

Condition of the open ground

Within the FC fence, the main area of open ground is at the north end but there is also a ride aligned east to west part way down the block and some ploughed unplanted ground at the southern end (Figure 1). I also looked at unplanted ground on neighbouring land to the east to get another example of the vegetation potential of this peatland. Peatland immediately to the west, across the farm road, supports young, very open, mixed woodland and is managed as such by Leadburn Community Woodland Group.

The northern area is rather heather-dominated (Figure 2) but away from drains, it has a high cover of Sphagnum moss (mainly *S. magellanicum*, *S. papillosum* and *S. capillifolium*) and supports good M18 bog vegetation in places (Figure 3). The heather dominance is probably due to the drying influence of the forest and drains on the adjacent peat. Although there are deer in the research area now, they were excluded for many years and this will have favoured the heather.

The east to west running ride supports bog vegetation but is gradually changing to woodland as it gets colonised by conifer regen. It is still capable of acting as a seed source and helping to recolonise the afforested ground, should the decision be made to restore the site to bog.

The ploughed, unplanted ground at the south end of the site is more sloping than the rest of the site. The vegetation is dominated by hare's-tail cottongrass *Eriophorum vaginatum*. It slopes down to an area of fen habitat with an inner zone of purple moor grass *Molinia caerulea* and an outer zone of rushes *Juncus* between the bog and the adjacent rising land with mineral soil and a very large chicken shed.

The open bog across the fence to the east of the block is in quite good condition. It has been drained but the drains have largely filled with Sphagnum (Figure 4) and are now pretty ineffective. These old drains would be virtually invisible were it not for the profuse growth of bog asphodel *Narthecium ossifragum* alongside them (Figure 5). In contrast to the open bog inside the fence, this area of bog has very short vegetation, probably because it has been quite heavily grazed. Heather is abundant but

not dominant, due to its cropped condition. Cross-leaved heath *Erica tetralix* is at least as abundant if not more so (Figure 6). Deer grass *Scirpus cespitosus* is fairly abundant and more obvious here than inside the fence, perhaps being favoured by the grazing. The surface is rather even, lacking the hummock/hollow micro-topography found in really good condition bog habitat.

The restored raised bog to the west of the disused Dolphinton Railway, part of the Leadburn Community Woodland, is still at quite an early stage of restoration because it was left fallow for a few years before the Community Group bought the site, decided to restore the bog and succeeded in bidding for funding for the work. The drains have been dammed, the conifer and birch regen cleared and it is now recovering very well (Figure 7). The site is still a bit drier than is ideal but on the whole the restoration is a success.

Condition of the afforested ground

Being a former research demonstration area, the woodland comprises a series of small square plots. Most of these are of Sitka spruce or lodgepole pine, although there are also individual plots of several other species, including Scots pine and Norway spruce. The planted ground north of the E-W ride was ploughed late in 1965 and planted in 1966 and 1967. South of the E-W ride was ploughed and planted ten years later.

The original cultivation was quite intense. North of the E-W ride had 0.6 m deep single mouldboard ploughing at 1.8 m spacing with cross-drains every 20 m. South of the ride, deep double mouldboard ploughing was used (strips of D60, D60/T90 and D90). The drains and furrows now mostly hold standing water or at least their bases are saturated. My test pits to check for peat cracking quickly filled with water. North of the main E-W ride, Even though the peat in the upper half metre will have dried and shrunk to some degree, the impact of the drainage and cultivation is minimal when you consider that the peat is around 5 m deep.

I dug at least 10 pits across plough furrows to check for peat cracking, which can affect the feasibility of raising the water table to restore a bog. I found virtually none, even though some of the pits were in tall, well grown stands with deep ploughing. The peat was more deeply rooted under lodgepole pine than under Sitka, as expected. The only place where I found some evidence of peat cracking, though not severe, was in the northern-most plot (the planted 'square chain' plot), which is drained along all four edges and has a crop of lodgepole pine. Even there the cracking was only in the early stages and would not affect the ability to raise the water table.

Peat depth and soil carbon store

I measured the peat depth as 5.4 m near the north end and 4.5 m near the southern end. Peat depth probably averages around 5 m. Thus the 8 ha site holds approximately 400,000 m³ of peat, representing a soil carbon store somewhere in the region of 15,000 tonnes of carbon.

Suitability for bog restoration

This block is well suited for bog restoration, being flat to gently sloping, having distinct and relatively few main drains, thus lending itself well to rewetting, and having plenty of intact bog vegetation around it.

What bog restoration would involve

Restoration would involve harvesting, preferably including brash, from which the release of nutrients would affect the condition of the restored bog, at least initially. It would also require damming of the drains and plough furrows to raise the water table as close as possible to the ground surface. At least one round of clearing regen would have to be planned for and then ongoing management to control further regen seeding in from the community woodland.

Interest from Leadburn Community Woodland Group

When leaving the site, I happened to meet Rik Smith from the Leadburn Community Woodland Group. He was very interested in the block's future because the Group has been considering how best to use some of its savings and might be keen to acquire more land. He thought that if the peatland is suitable for restoration and FES decides to go ahead with this, it might be interested in selling the block to the Group. He asked me to flag this up in my report.

Recommendations

I recommend restoring this area to raised bog. Although it represents a loss of around 8 ha of woodland, the benefits would be substantial. Restoration to raised bog would safeguard the approx. 15,000 tonnes of carbon stored in the peat. It would re-start peat formation so that the site would continue to lock up additional carbon in future. It would provide valuable habitat, well connected with other raised and intermediate bog habitats in the area. It could potentially provide a community resource for a well established community woodland group with a proven commitment to bog restoration and catering for walkers and nature lovers.

Russell Anderson
12 Sept 2013

Figure 1. 2007 air photo of the Leadburn block. The research area lies to the west of the N-S-running Leadburn to Peebles railway.

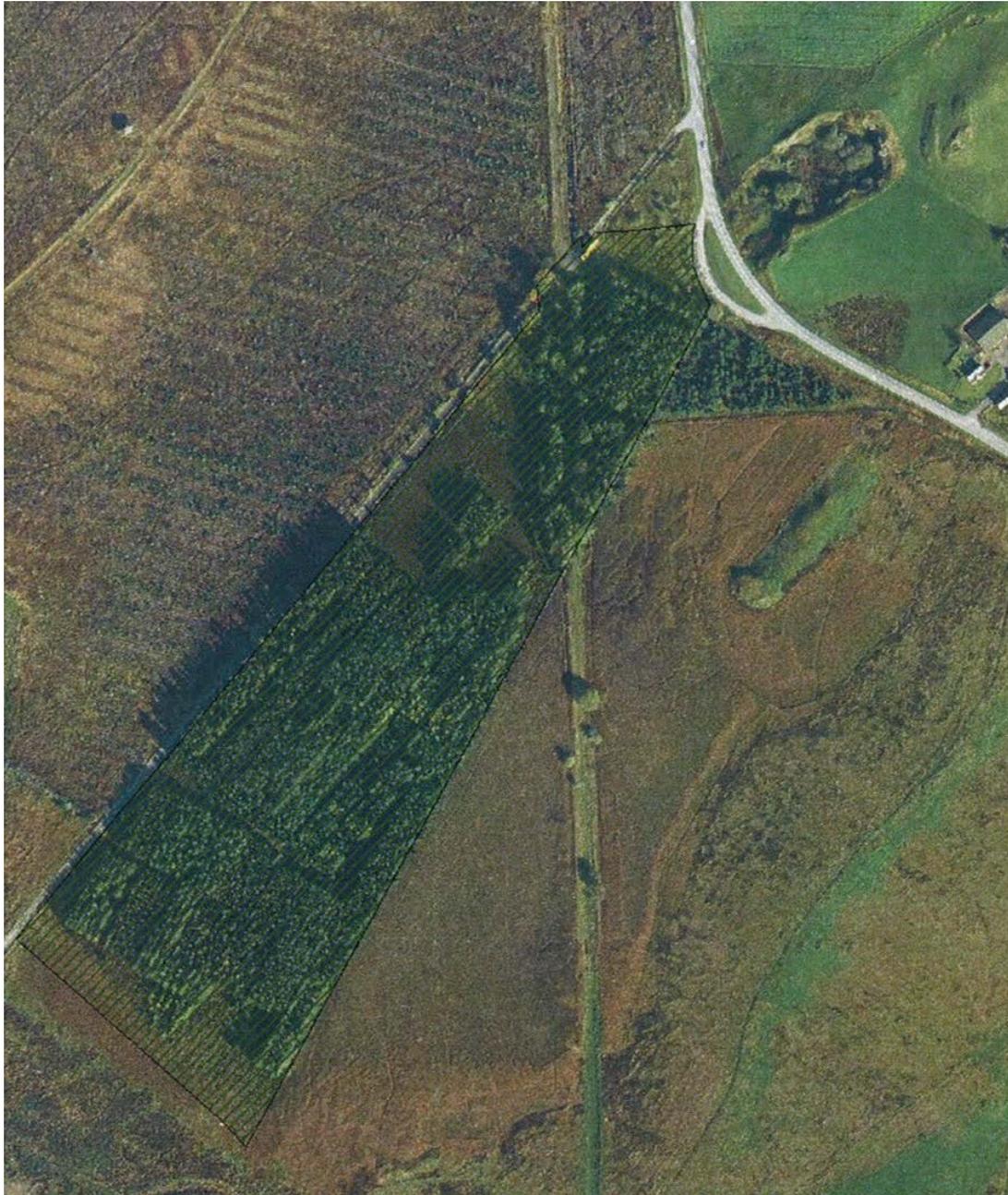


Figure 2. Heather-dominated bog with conifer regen at the north end of the site.



Figure 3. Some of the open ground at the north end of the site is less heather dominated and has a good mixture of bog species, including bog asphodel and magellanic bog-moss *Sphagnum magellanicum*.



Figure 4. Open bog on neighbouring land to the east was drained in the past but the drains, filled with Sphagnum, are now ineffective.



Figure 5. Some of the old drains on the land to the east are only detectable by the patches of bog asphodel growing alongside them.



Figure 6. The vegetation on adjacent land to the east is cropped quite short and much of it is dominated by ?? and cross-leaved heath.



Figure 7. Restored bog on land to the west managed by Leadburn Community Woodland Group. Photo taken April 2011.

