FOREST OF BOWLAND
Area of Outstanding Natural Beauty

Priority Peat 2013: An assessment of peatland in the Forest of Bowland AONB in need of restoration work

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S Robinson Consulting Final Report

November 2013

Contents

Appendices:

This work has been funded by:

Introduction

This work continues on from "Moorland and Fells: Lancashire's Upland Peat Restoration Plan – A Report to Lancashire's Upland peat Partnership", which was produced by Tim Graham and the Lancashire Wildlife Trust on behalf of the Lancashire Upland Peat Partnership in 2012. This report has been funded by the Environment Agency and Forest of Bowland Area of Outstanding Natural Beauty.

Priority Peat 2013 aims to detail the specific peat restoration works still to be completed within the Forest of Bowland AONB in order to have the information available to take advantage of any future funding opportunities which may occur.

Methodology

The approach taken was matrix-based, where specific attribute cells are populated with information for a pre-determined set of sites. This means that decisions relating to the prioritisation of sites within the set are not made at this point but can be made in the future, depending on the drivers at that time. For example, by including information such as site location, scale of work to be completed, type of work to be completed, attitude of owner/tenant or SSSI status, the set of sites can be prioritised against any number of different drivers – such as biodiversity gain, project cost or timescale needed for completion. The aim of the approach is to make information available to aid prioritisation in the future, not to make decisions on priorities before the specifics of any future drivers are known.

The Bowland Fells SSSI covers the majority of the upland moorland block within the AONB area, and so this was chosen as the fundamental basis for dividing up the area as a whole. In addition, each unit within the SSSI as a whole has its own unique number and also has ecological condition assessment information available. Although not always current, this information is invaluable in gaining insight into past management and present condition. A location map of the Bowland Fells SSSI and its management units is shown at Appendix 1.

Having chosen the initial framework of the SSSI units, this information was spatially overlain with:

- ownership and tenant details
- agri-environmental scheme information
- mapped grips and gullies
- areas of mapped bare peat
- areas of deep peat

The resulting GIS mapping was then used to start the construction of the information matrix.

The next stage was to verify this information and ensure its accuracy, through consultation with a wide range of stakeholders and colleagues.

Additional information was then gathered and added to the matrix:

- details of works completed under the agri-environment schemes Countryside Stewardship (CS) and Higher Level Stewardship (HLS)
- works completed as part of United Utilities Sustainable Catchment Management programme (SCaMP)
- details of further work scheduled into agri-environment agreements for completion in the future as part of the agreement
- details of work still to be done, but not currently part of any agreement
- details of conversations with land owners about their plans for and attitudes to peat restoration

Once all this information had been collated and verified and the matrix updated, it was then used to prioritise site visits for those areas where work had not occurred. As there was not enough time available to visit every site where there was restoration work to be completed, the site visits were designed as a ground-truthing exercise to enable better interpretation of the aerial photos of the sites.

Following the completion of the scheduled site visits, an assessment of bare peat, grips and gullies was made using aerial photos and the grip GIS dataset, in which area and percentage cover data were collected. These datasets were then used to populate an estimate of costs, based on costings from the Yorkshire Peat Partnership (YPP) and from recent peat restoration projects in Bowland.

Results

The Priority Peat Information Matrix is shown in Appendix 2.

The matrix includes information on SSSI unit ownership, tenants, initial general notes from consultations, grip and gully details from GIS mapping, aerial photos and consultation, bare peat areas from GIS mapping, aerial photos and consultation, details of sites to be visited and post visit notes, notes on additional factors, and scheme status. Unfortunately it was not possible to digitise the areas of gullying and bare peat, instead measurements were taken using Lancashire County Council's online mapping tool.

Approximate costs for bare peat restoration work required within each unit are also included, based on area assessments made from aerial photos and costings produced by YPP. Each unit within the SSSI as well as those fells outside of the SSSI boundary were then coded as follows:

20	No work needed
2	All work to do completed
1	All work needed already scheduled into HLS
18	Some work completed, more to do but not scheduled into HLS
23	Work to do, none done so far and none scheduled into HLS
4	Assessment not complete as yet

Of the 68 identifiable units analysed, 20 had no work needed, 2 were considered to have all work completed, 1 had all necessary work scheduled into HLS, 18 had some work completed with more to do, 23 had work to do with none done so far and 4 are still to be assessed. The total cost to restore the remaining areas of bare peat is thought to be in the region of £8.5mill.

A total of 22 of the units were visited between February and August 2013. Visit selection was based on a variety of criteria. In some cases it was to see work which was known to have been completed, in others to see how much more work was needed within units where some work had been undertaken. It was also interesting and informative to visit sites where bare peat restoration work had been undertaken as part of the SCaMP project. Details of the sites visited can be found in within the matrix in Appendix 2.

A location map showing the SSSI and its units is shown at Appendix 1 and photographs from the individual site visits can be found in Appendix 3.

A map showing the approximate location of areas containing bare peat lenses, haggs and gullies is shown at Appendix 4.

The combination of consultation, site visits and aerial photograph interpretation proved to be a powerful tool in gaining an overall view of the current condition of the peat within and around the Bowland fells SSSI, as set out below.

The northern Abbeystead spur of Bowland from Rooten Brook to Clougha, Ward's Stone and along to Wolf Hole Crag has areas of bare peat, haggs and drip edges along the north/south watershed. The Tarnbrook, Threpshaw and Blaze Moss fells less so, maybe because they have a more sheltered position in relation to the prevailing westerly weather. The areas of bare peat increase again at the western end of Marshaw, Hawthornthwaite and Langden Head. The Bleasdale Fells all have areas of bare peat and significant gullying, also perhaps a product of their situation facing the full force of the prevailing weather in the area, although a serious fire on Stakes Moss in the past has also contributed to the amount of bare peat present. The summit ridge from Brown Berry Plain north east of Parlick Pike along to Totridge is affected by erosion which has resulted in an intricate mosaic of haggs, drip edges and bare peat lenses, exacerbated by the access desire line which runs along the ridge.

It is perhaps interesting to give this overall assessment a historical perspective. In the 'Flora of West Lancashire', written by J A Wheldon and Albert Wilson and published over one hundred years ago in 1907, they describe Ward's Stone thus "*the peat has been worn away by the elements into deep gullies and the weathering process is now so rapid that considerable areas are now devoid of vegetation, the surface consisting of bare peat. The summit of Fairsnape and others present similar features*." They go on similarly "*The summit of Hawthornthwaite Fell forms part of a plateau extending south west to Johnny Pye's Clough Top and to White Moss at the head of the Langden Valley. An extensive area on the summit has been almost denuded of peat and is entirely bare of vegetation."* Appendix 5 contains photographs of Fairsnape summit (one of the Bleasdale Fells) from the book, as well as photographs of the same location as it looks now. It is clear to see that the deep gullies described in 1907 have widened by tens of metres over the intervening years, loosing large amounts of peat to erosion and leaving just isolated haggs of peat at the present time. The remaining peat on Fairsnape summit is now in the process of being stabilised as part of a restoration project funded by HLS, Environment Agency and Lancashire County Council, to ensure the remaining peat mass is not lost. Historic photographs of the Trough of Bowland (undated) recently found in the Clitheroe library archives show a similar pattern of gullying on the fell summit edges as is seen today.

The networks of drainage ditches (grips) superimposed onto the moorland during the 1950s and onwards have also contributed to the peat drying with resultant erosion causing further peat and habitat loss. It is this more recent man-made change to the fells which has been tackled first in terms of restoration work as the examples from Croasdale and Botton Head show in Appendix 3. The photographs in Appendix 5 illustrate how important it is to tackle peat erosion in natural gully features in order to prevent further carbon loss.

The Priority Peat Information Matrix presented at Appendix 2 will enable the prioritisation of projects involving peat reprofiling, gully blocking and revegetation as well as grip blocking over the area as a whole.

Next Steps

The production of the matrix spreadsheet proved to be an iterative process. As more information was gathered, it led to ideas about how to refine the finished product. This further refinement was not possible within the timescales of the project; however the work could develop into a fully functioning GIS product, for example:

- further development of the grip data layer could show by colour coding which grips have been blocked, which have been assessed on the ground to be no longer functioning and which still need to be blocked;
- digitising all of the gullies (some are already done as part of the grip data layer, but not all) to by colour coding show which are vegetated, which are eroding and need work as well as which have been restored;
- digitising all of the areas of bare peat to add to the layers above, commenting on the percentage of bare peat within those areas, and then coding to show where work has taken place;
- transferring the information from the information matrix at Appendix 2 into data layers and attribute tables for each fell unit, which would enable sites to be identified as priorities given specific sets of constraints or drivers.

Conclusions

The production of the Priority Peat information matrix has clarified the present situation in terms of what peat restoration has already taken place under various funding streams, what works are either in hand or scheduled for funding under current HLS agreements, and what works are outstanding. The work to produce the matrix has also been able to put approximate costs against the works still to be completed on a site by site basis, and enabled many of the sites to be visited. In addition the production of the matrix has facilitated additional dialogue with land owners, for example through the Bowland Land Managers Forum, in order to ascertain from them which areas of restoration they see as priority sites for work to be completed, if funding were available.

The matrix will enable potential projects to be identified quickly should specific amounts of local funding become available at short notice, and will also input local and site specific evidence across Bowland for larger strategic funding bids, such as EU LIFE.

The additional work suggested in the Next steps section above will take the information in the matrix and make it more accessible. GIS capacity and time limitations during the project have meant that areas of gullies and bare peat have been measured but not digitised. The location of these areas is shown in Appendix 4, but this is not a GIS based map. The data collected during this project would be more accessible and of wider use if it were all held within a GIS format.

S Robinson
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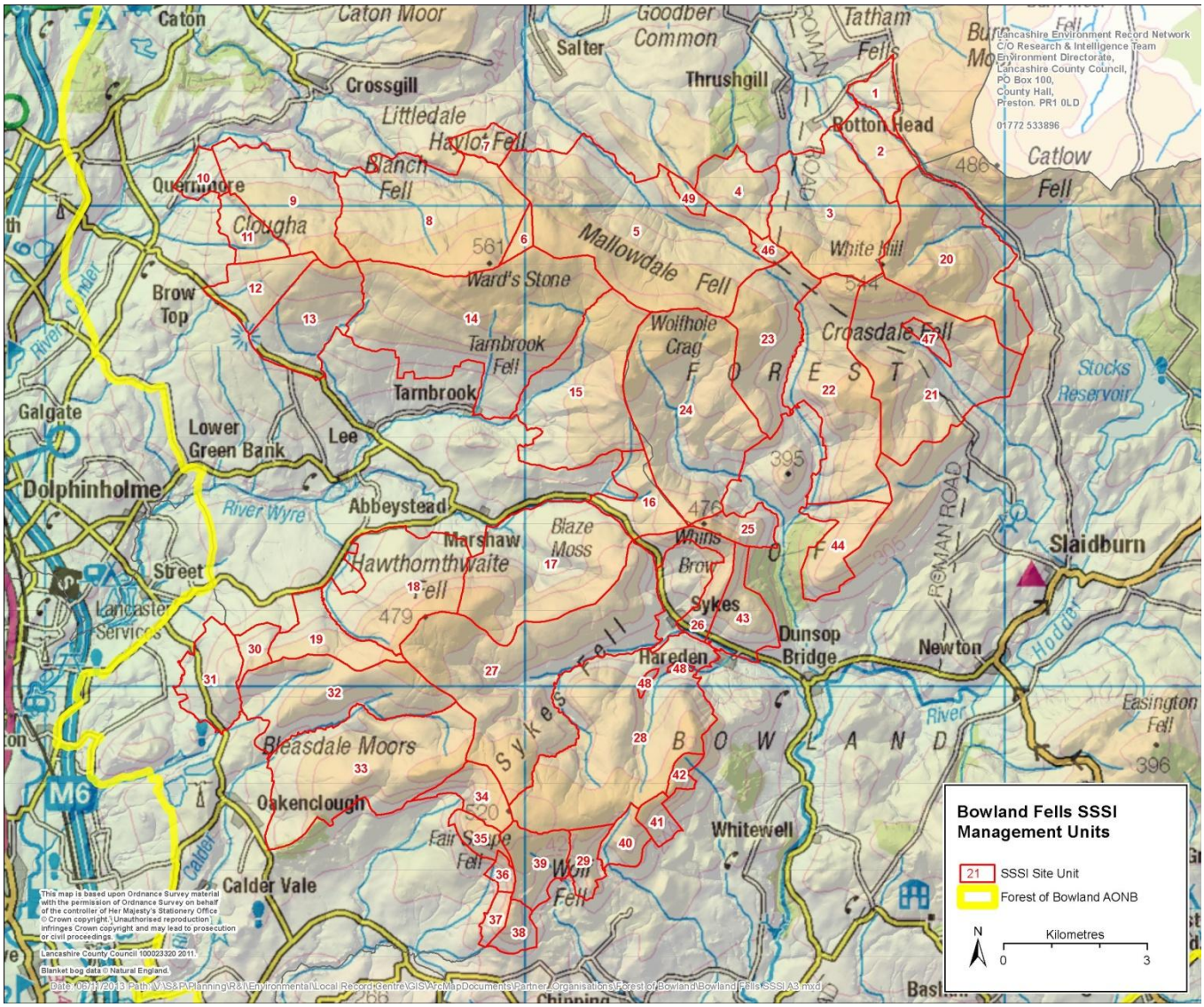
Appendix 1

Location map of Bowland fells SSSI with its numbered units



Appendix 2

Fell	SSSI Unit	notes	Grips	Gullies	Bare Peat	post visit notes	Scheme
Salter Fell	5	Grips due to be blocked by end March 2014 within the lower parts of fell between hawkshead and salter fells - *gulls*	grips to do are scheduled into HLS	gullies eminating from bare peat close to mallowdale	Area of micro erosion exacerbated by presence of lesser black backed gulls measured as 1.7 ha north of Hornby road. More bare peat adjacent to Mallowdale fenceline measured as 9.8 ha with 20% bare peat		HLS
Mallowdale	5	Bare peat, haggs & edges, stock exclusion going up and bare peat restoration to be done via HLS in Autumn 2013 *more areas of bare peat outside of fenceline on this fell - gulls*	grips in the lower northern part of Mallowdale - may not all be running	Two large gullies at the centre of the gripping to the lower northern edge of the fell	more bare peat and haggs to tackle outside of where HLS fenceline will go - 38 ha measured with 1-5% bare peat on prevailing wind edges	saw HLS area from the top of Tarnbrook	HLS
High Stephens Head	6		none on map	none on map	some areas of bare peat, haggs and edges- mapped out individually - 0.44 ha	gullies and hagg edges to do - visited with unit 50	none
Blanch Fell	8	SW corner is Brownley Hill and Cabin Flats, has areas of bare peat - no plans to restore areas of bare peat	none on map	wide gully with eroding edges adjacent to unit 6	Areas of micro-erosion north of the track at Brownley Hill - 11.5 ha 1-5% bare peat. Area of bare peat west of Brownley Hill 0.7 ha 20% bare peat. Areas of bare peat grading to mineral south of the track at Brownley Hill towards Cabin Flats - 18.4 ha 5% bare peat. Areas of bare peat south of Udale beck and west of Black Side of Ward Stone - 33.8 ha 5-10% bare peat.	areas of bare peat to revegetate	HLS
Black Fell	9	No grips but some haggs and bare peat in top corner adjacent to unit 8 - no plans to restore areas of bare peat	none on map	none on map	Area of bare peat included in measured 18.4 ha at Cabin Flats shown in info for Unit 8	areas of bare peat to revegetate	HLS
Fell End Fell	10	No grips on map	none on map	none on map	none		HLS
Rowton Brook Fell	11	no specific peat restoration works to carry out	grips on map - not sure if running	none on map	none		HLS
Hare Apple Tree Fell	12	Erosion issues on boundary with Abbeystead Fell up along path. Coming into HLS by end 2013, grip blocking due to follow.	to do - scheduled	none on map	Area of haggs and bare peat at Red Moss 1.1 ha 25%		HLS

Fell	SSSI Unit	notes	Grips	Gullies	Bare Peat	post visit notes	Scheme
Abbeystead Fell	13	Grips on map on lower most part of Fell. First visit has shown most vegetated but some still running and eroding.	to do - scheduled	gullies with area of bare peat and mineral soil in NE corner of unit	2.8 ha of haggs and bare peat at Shooters pile, 50% bare mineral, 5% bare peat. 6 ha bare peat, mineral soil, haggs & gullies in NE corner	Now in HLS and grips due to be blocked	HLS
Lee Fell	14	Grips on Map - a few near the lower end - don't need work	grips on map - but don't need work	8.4 ha to the east of the bare peat containing 7 eroding gullies	8.4 ha containing 5% bare peat and one eroding gully		HLS
Dunkenshaw Fell	14	Grips on Map - a few near the lower end - don't need work	grips on map - but don't need work	none on map	1.2 ha containing 6 lenses of bare peat, mapped as pools an OS map. 0.3 ha of bare peat haggs		HLS
Tarnbrook Fell	15	A few grips on the map but not considered a problem.This part of Tarnbrook is being split by a fence up Gables Clough.	grips on map - but don't need work	some gullies NW of Woodyards, wide with vegetated bottoms but bare peat edges	9.1 ha containing 1-5% eroding haggs and bare peat lenses adjacent to bare peat on Mallowdale and Hare Syke. Two areas containing 5% bare peat at the break of slope.		HLS
Whiteside of Tarnbrook	15	A few grips on the map It is not considered necesary to block these.	grips on map - but don't need work	none on map	2.7 ha at break of slope with 1-5% hagg edges		HLS
Threpshaw Clough	16	A few grips on the map	grips on map - but don't need work	some gullies, but do not appear to be eroding	none		HLS
Marshaw Fell	17	Grips on the map - being done under HLS	large fan shape of grips south of Tower Lodge - due to be done in HLS	some gullies along watershed, but do not appear to be eroding	very little, apart from 4.9 ha of 10-20% erosion, bare peat, haggs and gullies at Lingy Pits and 14.5 ha 5% bare peat at boundary with Hawthornthwaite		HLS
East of Hawthornthaite Fell	18	Work nearly completed to restore bare peat and haggs on top of Fell under HLS.	grips on map - but don't need work	11.7 ha containing eroding gullies at boundary with Langden Head and Marshaw	9.6 ha of 25-50% bare peat lenses and haggs adjacent to Langden Head and west of gullies	Just saw work over the fence from UU side when visiting Langden Head	HLS
Hawthorntwaite Fell	18	Work nearly completed to restore bare peat and haggs on top of Fell under HLS.	grips to do at Blind Clough	none eroding on map	8 ha 20-30% bare peat lenses adjacent to Landgen Head boundary	Just saw work over the fence from UU side when visiting Langden Head	HLS
Catshaw Fell	19	Small square of intense gripping in lower most NW edge of the fell	Grips to do	none eroding on map	6.7 ha 5% bare peat lenses and haggs at the top of Johhny Pye's clough adjacent to Hawthornthwaite	some vegetated, others running	HLS
Salter Fell	46	Fenced off WES within unit 5 - small area	Grips to do	no gullies	no bare peat but some hagg edges		HLS
Salter Fell	49	Fenced off WES within unit 5 - small area	grips on map but don't look to be active	no gullies	none		HLS

Fell	SSSI Unit	notes	Grips	Gullies	Bare Peat	post visit notes	Scheme
Hare Syke Crag	50	Two areas of bare peat and gullies on the map - the other more centred on Hare Syke Crag	grips on map - but don't need work	28 ha containing eroding gullies adjacent to the southern boundary of unit 6. 26 ha containing eroding gullies at Hare Syke Crag.	12.7 ha of 30 - 50% bare peat south of Hare Syke Crag	areas of bare peat and gullies to re-profile	HLS
Blackside of Tarnbrook	50	Areas of bare peat on the map - *gulls*	none on map	2 main areas of gullies - one coming off Brown Syke - 1.6ha and a second south of Hare Syke - 2.5 ha	Two main areas containing bare peat Brown Syke to the north 11.6 ha with 20% bare peat in large lenses and south of Hare Syke - 16.9 ha with 10-20% bare peat	areas of bare peat and gullies to re-profile	HLS
Haylot fell	7		grips on the map - but no work considered necessary on the ground	none on map	none		none
Fair Oak Fell	41	No grips on the map	none on map	gullying is vegetated and does not appear to be eroding	one small area of bare peat and eroding haggs in the north west corner within a 0.4 ha area		HLS
Grizedale Fell	32	Hags to do at Grizedale Head	some done and some to do	10.5 ha containing eroding gullies below grips at Greaves Clough Head	0.29 ha containing 50% bare peat at Grizedale Head. 9 ha 20% bare peat in haggs and lenses along Stake House Fell		HLS
Bleasdale Moors	33	Grips on the map blocked	some done and some to do	10 ha of eroding gullies to the SE of Hunters Clough	10 ha of gullies also contains hagg edges and lenses of bare peat at Hunters Clough (19-20%). 1.2 ha including 20% bare peat on the summit of Luddocks.		HLS
Hazelhurst Fell	33	Grips on the map blocked	some done and some to do	13 ha including 1-5% eroding gullies above the track north of Woodend Wood. 1.7 ha including 10% eroding gullies east of the coolam track.	13.5 ha micro-erosion on the plateau just north of the filled grips west of Fiendsdale Head.		HLS
Oakenclough Fell	33		none on map	gullies on map do not look to be eroding	none		HLS
Holme House Fell & Fiendsdale head	34	Bare peat and gullies currently being tackled inside enclosure - owner reports will still be more to do inside and outside	none on map	upstream gullies have been tackled first, more to do	eroding haggs tackled inside enclosure 20 ha to go outside		HLS

Fell	SSSI Unit	notes	Grips	Gullies	Bare Peat	post visit notes	Scheme
Fairsnape	35	Bare peat currently being tackled - owner reports will still be more to do	none on map	none	eroding haggs - will still be some to do 10-15 ha still to do		HLS
Blindhurst	36	No grips on the map	none on map	none	none		HLS
Harris End Fell	31	A few grips on the map but not considered a problem- no work necessary	grips on map - but don't need work	none on map	none on map		HLS
Stable Oak Fell	43	Nothing to do	none on map	none	none		HLS
Beatrix Fell	44	Nothing to do	none on map	none	none		HLS
Burnslack	40	A few grips on the map- but not considered a problem or work necessary	none on map	gullying is vegetated and does not appear to be eroding	one small area of bare peat and radiating gullies in the northern most tip within a 0.5 ha triangle		HLS
Botton Head	3	Lots of grips have been blocked, but still more to do, more recently scheduled into HLS	maybe a few still to do in the northerly section	natural drainage channels do not appear to be eroding from the aerials	owner reports vertical hagg edges in the S section above Long Clough	appeared that all grips have been blocked - but visibility poor, so need to check	HLS
Greenbank	4	Grips blocked, but manager reports will be more to do - scheduled into HLS	mostly blocked, more to do	gullies may be eroding - not scheduled in to HLS	none	most of the grips have been blocked but not all - due to be measured	HLS
Hayshaw Fell	30	No grips on map	none on map	none on map	none on map		HLS
Starkers Fell	1		none on map	natural drainage channels do not appear to be eroding from the aerials	none	n/a	none
Whitray	2	Grips on middle and lower most part of the fell need blocking. Ones on top of fell (most southerly part) blocked under HLS.	half done	one large natural watercourse	none	need to check again	HLS
Little Blindhurst	37	No grips on the map	none on map	none	none		HLS
Parlick	38	No grips on the map	none on map	none	none		none
Whitmore	42	No grips on the map	none on map	none	some of the haggs are eroding along the top boundary wall within an area of 1.3 ha 5-10% bare peat.		CSS 2014

Fell	SSSI Unit	notes	Grips	Gullies	Bare Peat	post visit notes	Scheme
Goodber Common	n/a	Hoping to get into HLS, but commoners still deliberating, have until end March to decide. Has been surveyed and there are 3 grips which need sorting	GRIPS TO DO - may be done under HLS				?HLS
Clapham Common	n/a		Grips to do	one large eroding gully running down Bent's Hill - incomplete aerial coverage	small areas at knott end well		UELS
Clapham Burnmoor	n/a	Grips will be blocked through HLS agreement - need to know timescale	to do - scheduled into HLS				HLS
Austwick Common	n/a						
Giggleswick Common	n/a						
Rathmell Common	n/a						
Pendle Hill outlier	n/a	Incorporating all the individual moors within the outlier area					
Lamb Hill	20	Eroding gullies still to be done south of Tower Hill	none on map	gullies along near Costy Clough on map, but do not appear to be eroding	0.7 ha 50% bare peat at the site of the rain gauge adjacent to Croasdale fell		HLS
Croasdale Fell	21	One big grip of 1/2 km in length to block	done	eroding gullies within 12.2 ha at the Tower at the boundary with Botton Head and Lamb Hill. Eroding gullies within 9.4 ha at Baxton Fell.	50% Bare peat lenses, haggs and gullies within 3.4 ha at Proctor Moss, adjacent to Dunsop Fell	grip blocked	HLS
Hard Hill Top	22	No grips or eroding gullies	grips on map - but don't need work	gullies not eroding	6.4 ha of 20-25% bare peat lenses and haggs at the top of Hard Top Hill. 0.6 ha with 30% bare peat at boundary with Baxton Fell (unit 21)		HLS
Whitendale	23	Narrow strip of bare peat and gullies on Whitendale side of fence still to do - at Whitendale Hanging stones	done	9.3 ha close to Hanging Stones with eroding gullies	9.3 ha with gullies also contains some lenses of bare peat		HLS
Brennand	24	NE corner done by SCaMP 2010-11 - Brown Syke Hill - did reprofiling and geojute, fert, lime & seed. Some peripheral work still to do. 30 km grips also done on Brennand in 2009	done	gullies within 9.4 ha at Brennand Hanging Stones	more to do around Brown Syke Hill - bare peat within 4-5ha		HLS

Fell	SSSI Unit	notes	Grips	Gullies	Bare Peat	post visit notes	Scheme
Whin Fell	25	No grips on map bare areas following bracken spraying have been reseeded	none on map	none	none		HLS
Whins Brow & Sykes Nab	26	No grips	none on map	none on map	3.5 ha containing 1-5% eroding hagg edges at boundary with Brennard and 1.1 ha similar at boundary with Staple Oak		ELS
Langden Head	27	Fence enclosure through SCaMP 2008-9, reprofiling & full restoration Gullies still to do outside of the enclosure, plus 5-10 ha bare peat @ Fox Holes	none on map	30 ha around Langden head outside of current SCaMP enclosure containing eroding gullies. Whole of Webster's Meadow area is gullied, but not all eroding. Similarly at Red Scar Breast	0.8 ha 50% bare peat around pool a tthe top opf Blaze Moss.	Gullies to do outside of fence. Bare peat at Fox Holes showing strong signs of cotton grass regen on its own	HLS
Hareden Fell	28	Bare peat and gullying at Brown Berry Plain from fence with Holme House Fell eastwards	none on map	Areas of gullying radiating from bare peat at Brown Berry Plain.	7.3 ha at Brown Berry Plain with 20 - 30% bare peat lenses and haggs. 8.5 ha containing 5% bare peat and eroding haggs at the summit of Totridge. Band of eroding hagg edges all the way between Brown Berry Plain and Totridge, with all westerly faces eroding - total of 50ha small scale and closely packed. Also path erosion along the fenceline up to the summit of Totridge		HLS
Croasdale Fell	47	Fenced off	none on map	none	none		HLS
Hareden Fell	48	Fenced off under WES	none on map	none	none		HLS
Halstead Fell	n/a	Grips been blocked under SCaMP - 5km adjacent to Brock Clough Beck	done				HLS
Crutchenber Fell	n/a	No grips on the map	none on map				ELS
Hasgill Fell	n/a	No grips on the map	none on map				ELS
Catlow Fell	n/a	No grips on the map	none on map				ELS
Saddle Fell	29	maybe some bare peat right up on the top fence line - will check with owner - no grips	none on map	Around 10 ha containing gullies and haggs and bare peat 1-5%	Around 10 ha containing gullies and haggs and bare peat 1-5%	Area of peat on the top needs reveg work - doesnot look as if it needs re-profiling though	HLS
Wolf Fell	39	Haggs & bare peat being tackled under new HLS scheme	none on map	none	hagg edges been tackled via HLS (16 days reprofiling machine days)		HLS
Claughton Moor	n/a						
Lythe Fell	n/a						

Appendix 3

Photographs from site visits 2013

Unit 3 – Botton Head – blocked grips, May 2013

Unit 3 – Botton Head – grip to block July 2013

Units 8 & 9, Black & Blanch Fell Cabin Flats – these units contain in the region of 65 ha with 5-10% bare peat, May 2013

Units 8 & 9, Black & Blanch Fell Cabin Flats – these units contain in the region of 65 ha with 5-10% bare peat, May 2013

Unit 19 Catshaw Fell – naturally re-vegetated grip, May 2013

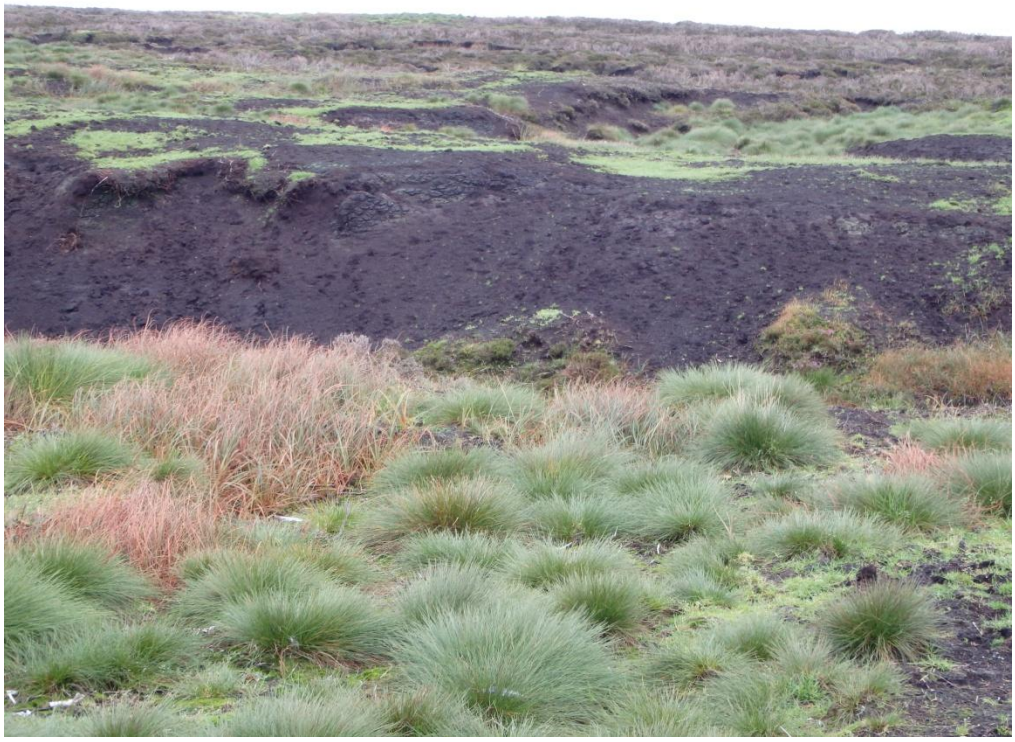
Unit 19 Catshaw Fell – active grip revegetating, May 2013

Unit 21 Croasdale Fell – blocked grip, April 2013

Unit 23 Whitendale – reprofiled with nurse crop slowly being replaced with *Eriophorum,* July 2013

Unit 24 Brennand – additional work still to complete outside of SCaMP enclosure, July 2013 – additional gullies and bare peat fall within a further 15 ha of moorland on this site

Unit 27 Langden Head – area showing natural regeneration in the absence of grazing only, August 2013

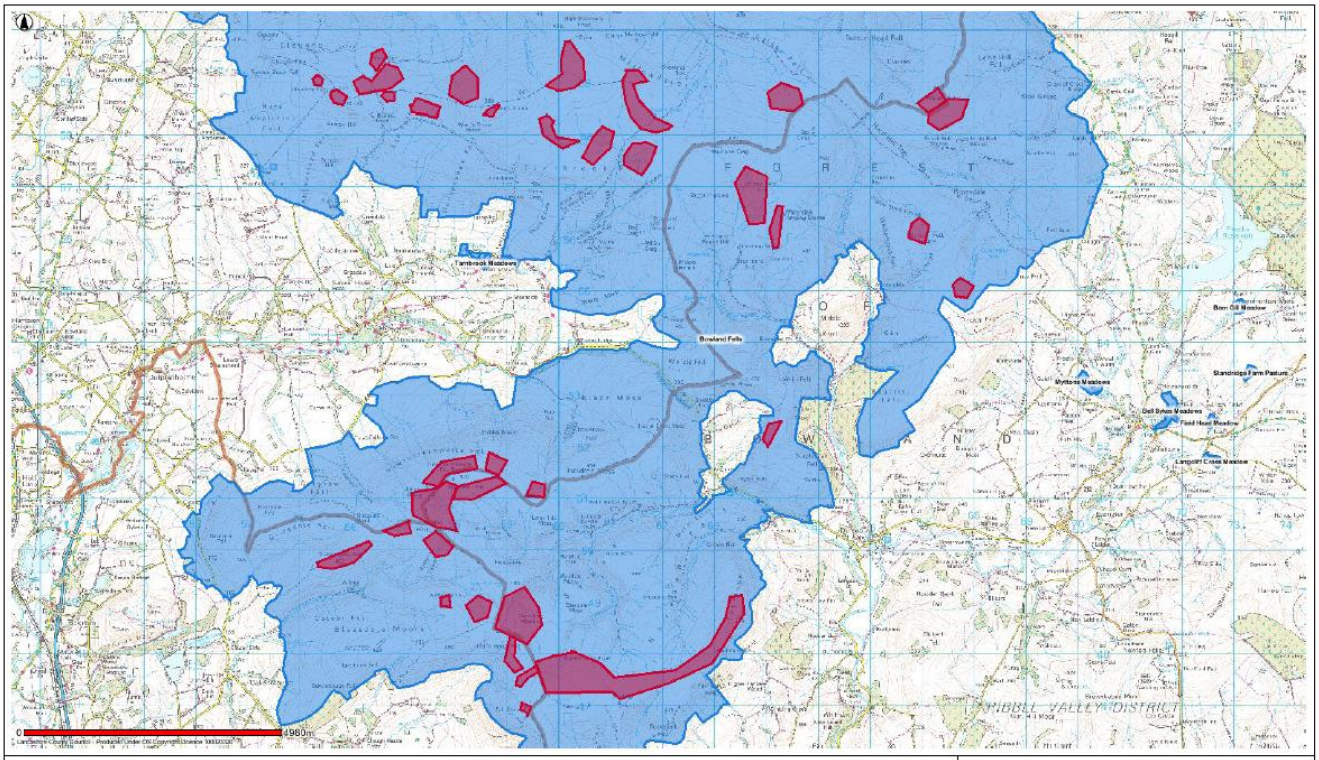


Unit 27 Langden Head – areas needing restoration outside of the SCaMP fence, also showing eutrophication damage from Lesser Black Backed Gulls, August 2013 – 30 ha of gullied peat at Websters Meadow still to tackle

Unit 29 Saddle Fell – contains areas of a close mosaic of bare peat and hagging within the heather vegetation, especially along the watershed to Totridge

Appendix 4

Approximate locations of Gully and bare peat areas



Appendix 4 - Approximate locations of gully and bare peat areas, Bowland 2013

Lancashire County Council

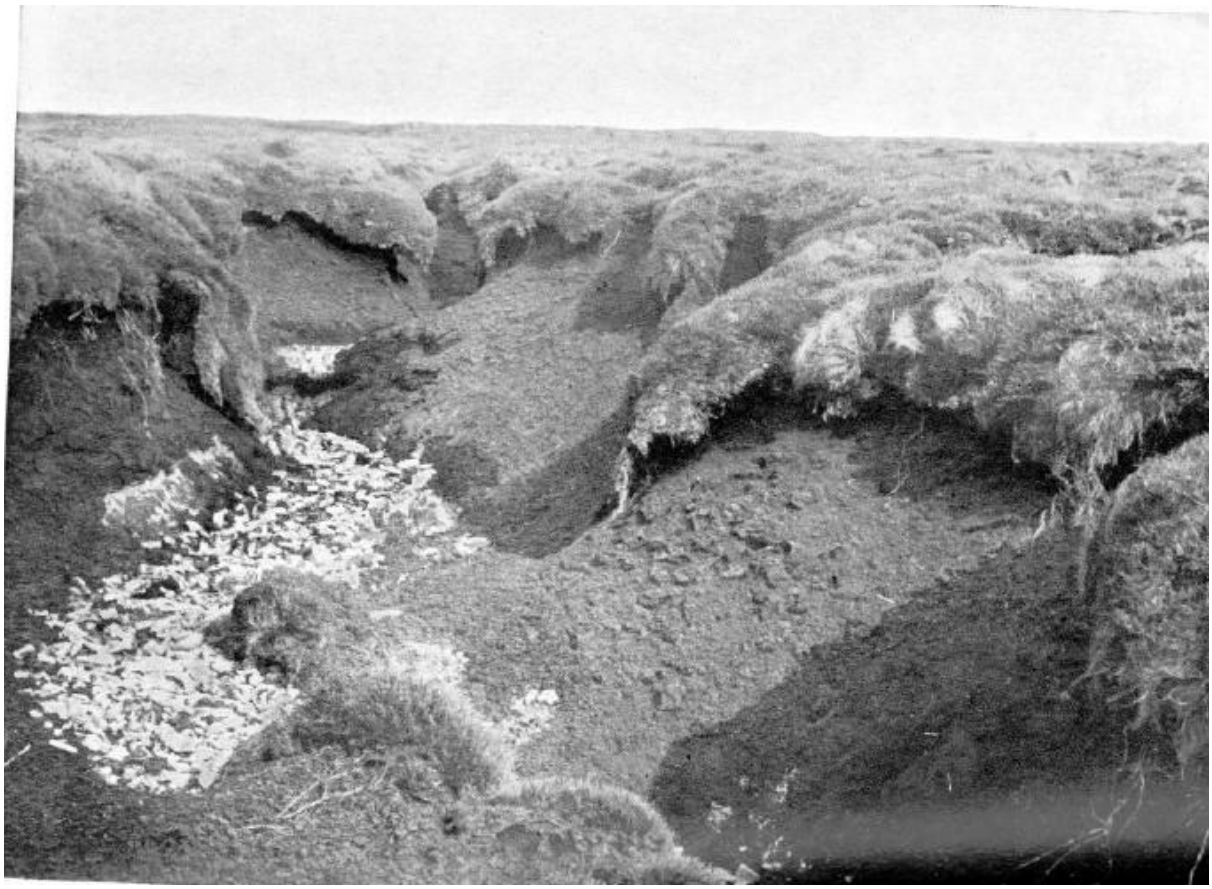
Date: 07/11/2013

Centre of map: 361923:453268

Appendix 5

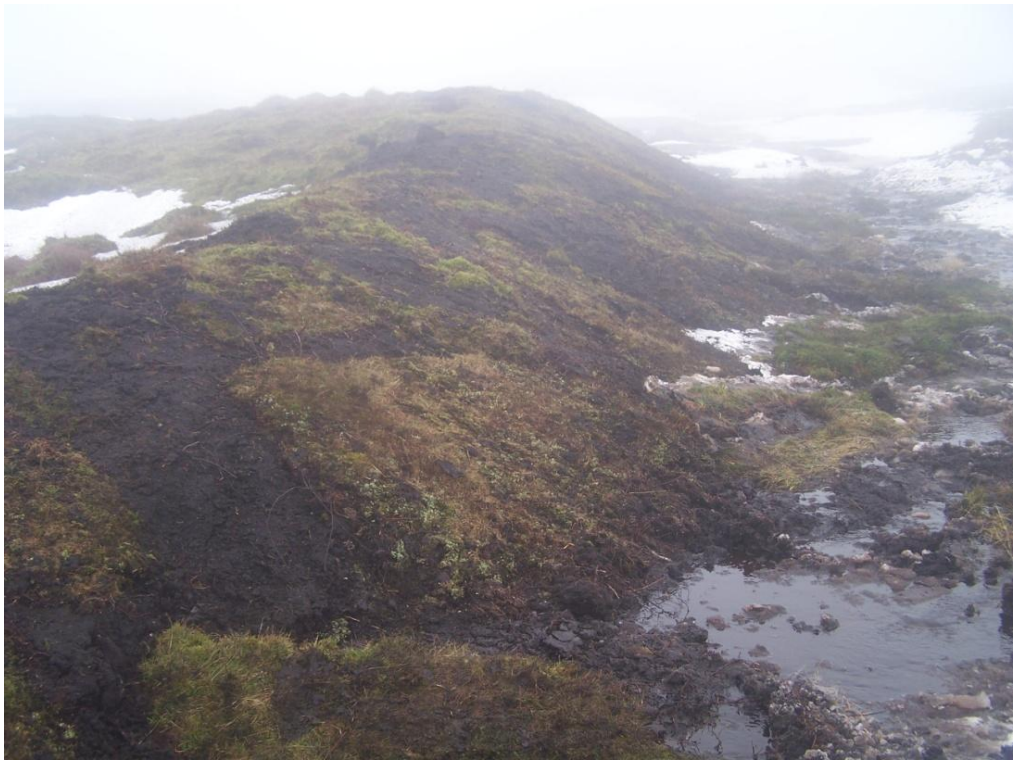
Historic photographs of areas of peat in Bowland

Haggs and bare peat on Fairsnape, 1907

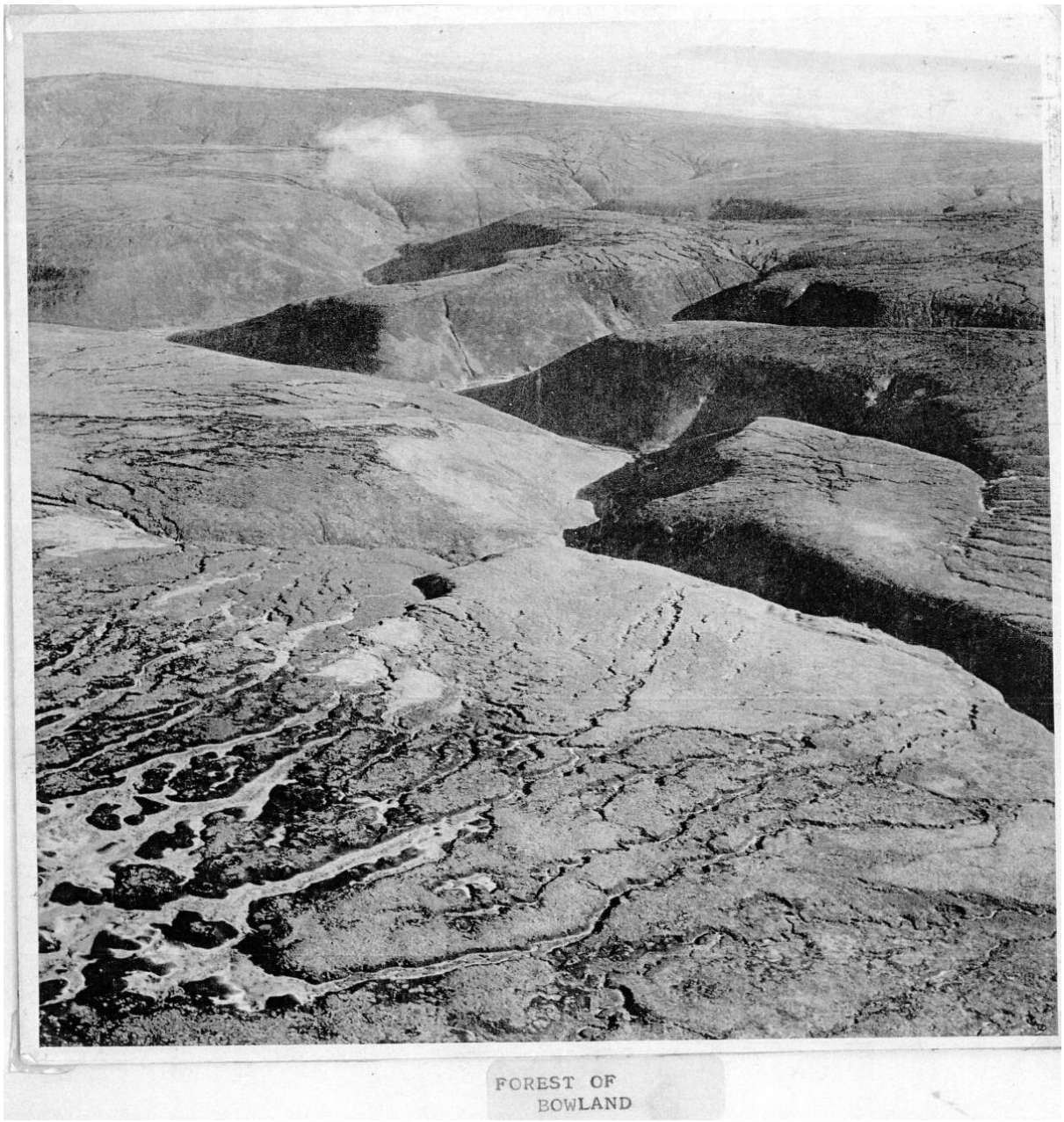


Deep gullies and drip edges on Fairsnape summit, 1907

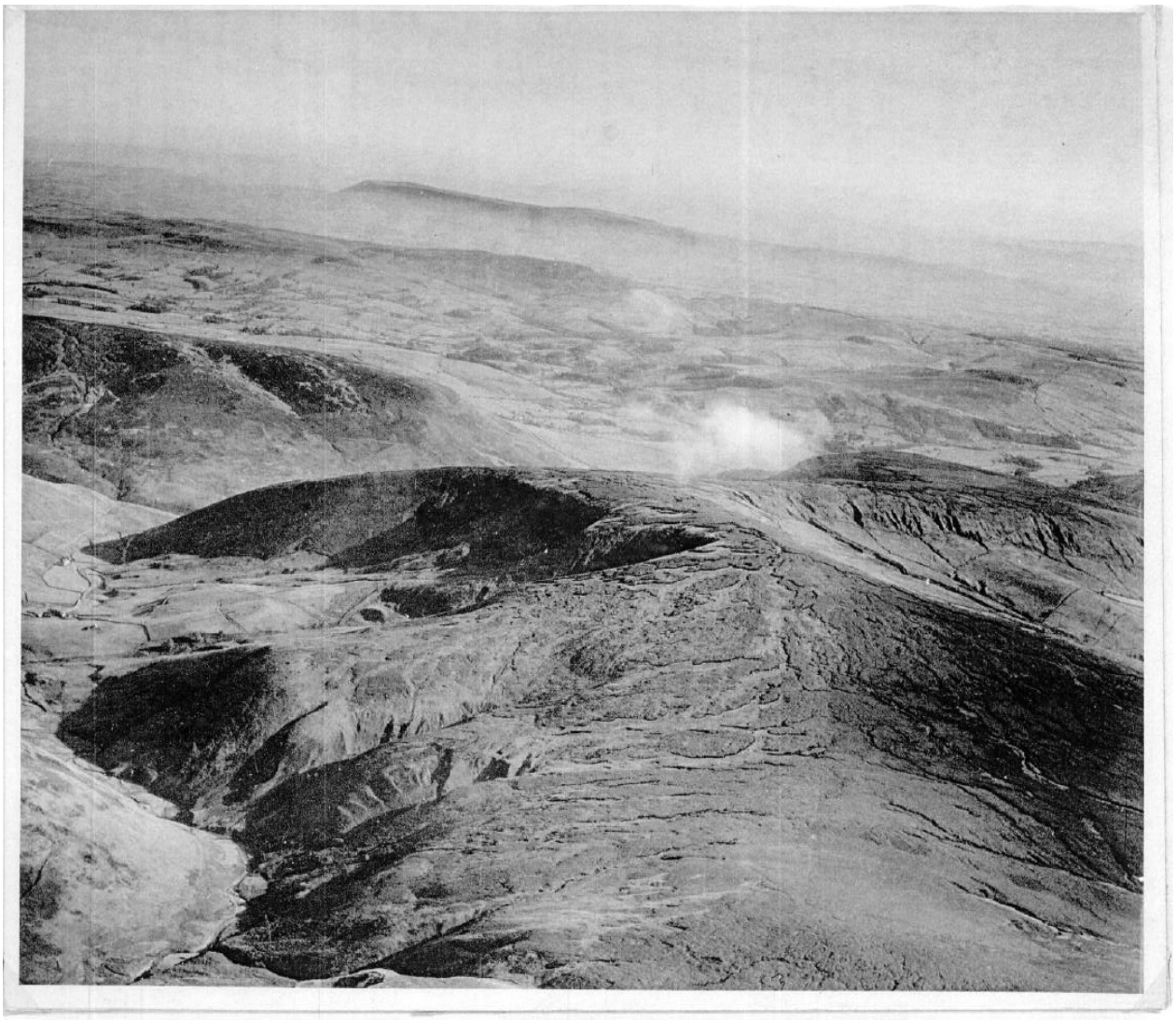
Machine reprofiling at Fairsnape, 1 Feb 2013



Fairsnape, re-profiled and re-turfed hag, 14 Feb, 2013



Undated photograph from Clitheroe libary archive showing areas of bare peat and gullying on plateau tops.



Undated photograph from Clitheroe Libary archive showing peat body dissected by gullies.