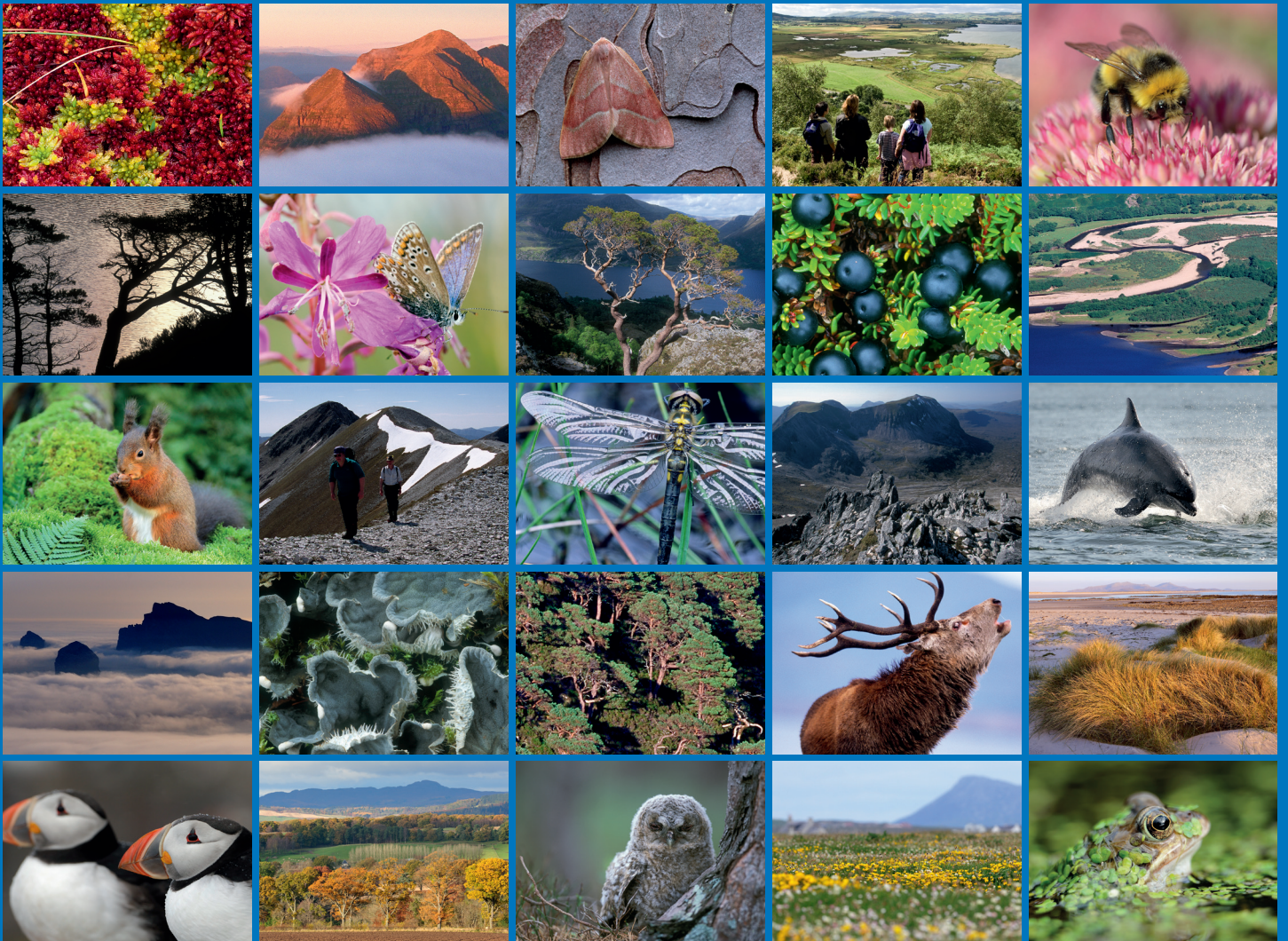


Birks of Aberfeldy SSSI: Lichen survey with recommendations on beech management





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RESEARCH REPORT

Research Report No. 1137

Birks of Aberfeldy SSSI: Lichen survey with recommendations on beech management

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RESEARCH REPORT

Summary

Birks of Aberfeldy SSSI: Lichen survey with recommendations on beech management

Research Report No. 1137
Project No: 113848
Contractor: John R. Douglass
Year of publication: 2020

Keywords

Birks; Aberfeldy SSSI; lichens; beech management.

Background

The lichen assemblage of the Birks of Aberfeldy SSSI is in unfavourable condition, mainly due to abundant beech regeneration throughout the site. Despite eight visits to the site by lichenologists, including Site Condition Monitoring (SCM) in 2012/2013 (Douglass, 2013), each visit was relatively brief and no full lichen survey has ever been commissioned for this site. In order to prioritise the sensitive removal of beech SNH requires a full lichen survey of the site but the focus is on areas of high beech abundance. This survey will identify individual or groups of native trees and rocks that support important lichens and prioritise them for localised beech management.

Main findings

- Beech management has been prioritised in relation to the threat posed to lichens of conservation concern.
- Ring barking is recommended for beech trees away from the main track. This should be done gradually over several years and will increase light levels for lichens of conservation importance as well as providing much needed deadwood habitat.
- Felling of mature beech has already begun in compartment 8. Controlled felling of mature beech is recommended for trees close to the main track.
- 45 lichen taxa were added to the SSSI list including the following species of conservation concern: *Bacidia carneoglauca* (NS) *Chaenothecopsis savonica* (NT, NR, Sc), *Collema furfuraceum* (ESIEC, Bonus species), *Lecanora argentata* (NS), *Lepraria ecorticata* (NS), *Parmeliella parvula* (Sc, L, IR), *Schismatomma umbrinum* (NS, Sc, IR), *Sphaerophorus globosus*, *Sticta fuliginosa* (Sc, L, IR) and *Thelenella larbalestieri* (VU D2 NR E Sc IR).
- Eight lichenicolous fungi were new for the SSSI including *Endococcus brachysporus* (NR) on *Porpidia rugosa*, *Illosporiopsis christiansenii* (NS) on *Physcia tenella*, *Lichenocodium erodens* on *Evernia prunastri*, *Opegrapha thelotrematis* (NS Sc IR) on *Thelotrema lepadinum*; *Sagediopsis lomnitzensis* (NS) on *Ionaspis lacustris*; *Stigmatidium microspilum* on *Graphis scripta*, *Tremella coppinsii* (NS) on *Platismatia glauca* and *Unguiculariopsis lettaui* (NS) on *Evernia prunastri*.
- *Nephroma resupinatum*, thought extinct in the UK, was found on the site.

- Our knowledge of East of Scotland Indices of Ecological Continuity (ESIEC) and *Lobarion* species has increased with some species being more abundant than previously thought such as *Lopadium disciforme*, *Peltigera collina*, *Sticta limbata* and *S. sylvatica*. *Lobaria pulmonaria* (Sc, L, IR) previously only known from a single hazel stool was found on a second hazel near the base of the ravine below DMP 7 and *Pannaria conoplea* (Sc, L, IR) not seen since 1986 was re-found on an ash.
- Surveying for freshwater lichens was limited by the relative high water levels and snow and ice during the survey work. However, it was possible to locate a few species new for the SSSI including: *Porpidia rugosa*, *Thelenella larbalestieri* (VU D2 NR E Sc IR), *Verrucaria hydrophila* *V. margacea* and *V. rosula* (NR?).
- *Bacidia subincompta* (VU C, D1 NS P Eng Sc) was found on another ash tree in another 1km square.
- The tall, straight growing willows are a very important phorophyte for lichens at this site. They support several *Lobarion* species including: *Bacidia absistens*, *Biatora chrysantha*, *Leptogium lichenoides*, *Lobaria scrobiculata*, *Lopadium disciforme* and *Megalania pulverea*, *Mycobilimbia epixanthoides*, *Nephroma laevigatum*, *N. Parile*, *N. resupinatum*, *Parmeliella parvula*, *Peltigera collina*, *P. horizontalis*, *Protopannaria pezizoides*, *Sticta limbata*, *S. sylvatica* and *Thelotrema lepadinum*.
- The ESIEC for the site is 26 + 4 bonus sp. for all recording periods with 2 additions found during the survey *Chaenothecopsis savonica* and *Collema furfuraceum*. This is the highest score for similar woodlands in eastern Scotland with Drummond Wood coming second with (27 + 2 bonus sp.) and in descending order: Milton Wood (25), Ardvorlich Wood (23), Cawdor Wood (20), Glen Tilt (17), Monzie Wood (16), Craighall (15) & Bolfracks Wood & Comrie Woods (14).

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1. INTRODUCTION

1.1 Background

The Birks of Aberfeldy is a ravine woodland with the Moness Burn which runs south to north and discharges into the River Tay just North of the SSSI. The geology is comprised of Dalradian schists and gneiss. The woodland is composed of birch, oak, ash and willow with hazel, rowan and alder. Sycamore are also occasional at this site together with Norway spruce. *Rhododendron* sp. occur near the car park but *Rhododendron ponticum* does not appear to be present in the main woodland or ravine.

Beech is a major component of the site especially in the northern section. Elm was once a major component of the site until the impact of Dutch Elm Disease. The lichen assemblage of the Birks of Aberfeldy SSSI is in unfavourable condition, mainly due to abundant beech regeneration throughout the site. In order to prioritise the sensitive removal of beech SNH required a full lichen survey focusing on areas of high beech abundance in order to identify individual or groups of native trees and rocks that support important lichens and prioritise them for localised beech management.

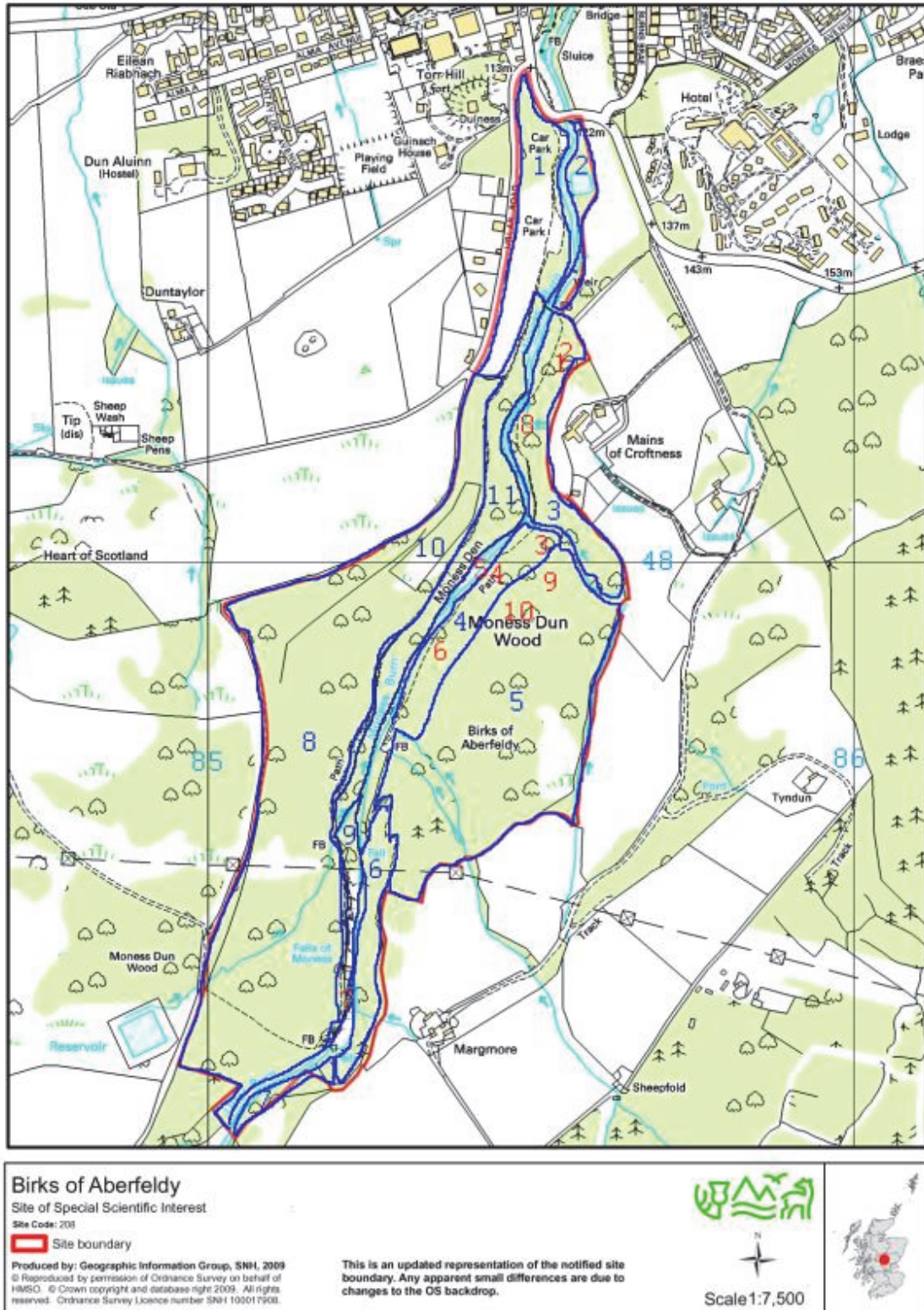
A full beech management plan is out-with the scope of this report. However, this survey does identify priority mature trees for felling together with areas of sapling regeneration which require ongoing control e.g. pulling. Young trees that are not yet producing seed are a lower priority for management in areas where they do not pose an immediate threat to lichens of conservation importance. There may also be areas where beech provides shelter and humidity for sensitive lichen species and where a staged removal over a number of years is appropriate, in order to allow native trees to recover and minimise the likelihood of 'exposure-shock'.

Some beech management has already taken place in the lower gorge and further work is planned over the winter of 2017/18. The report produced will help prioritise future areas for beech removal.

Following the Site Condition Monitoring by Douglass in 2013 a full lichen survey was recommended in order to further our understanding of the SSSI. In 2013, 171 species of lichen were known for the SSSI including 15 Nationally Scarce species and two IUCN Vulnerable species: *Bacidia circumspecta*, recorded from elm and *Bacidia subincompta*, recorded on oak. Both species were recorded in the 1974-1986 period with *Bacidia subincompta* re-found on ash and monitored in 2013.

A significant number of old woodland species of the Lobarion community have been recorded, including species of the Lobarion community present including: *Arthonia vinosa*, *Catinaria atropurpurea*, *Degelia plumbea* s. str., *Fuscopannaria mediterranea*, *Lobaria pulmonaria*, *L. scrobiculata*, *Mycobilimbia pilularis*, *Nephroma laevigatum*, *N. parile*, *Nephroma resupinatum* (a new site record in 2013, though extinct in the UK), *Normandina pulchella*, *Pannaria conoplea*, *Parmeliella triptophylla*, *Peltigera collina*, *P. horizontalis*, *Sticta limbata* (New site record in 2013), *S. sylvatica* and also, an old woodland member of the *Graphidion* community *Pyrenula occidentalis*.

The rocks within the site had previously only been looked at briefly (30 species over the recording period 1974—2001). They included two nationally scarce species *Aspicilia laevata* and *Lecidea ahlesii*. *Pseudocyphellaria crocata* was last recorded on "perpendicular rocks beside the second fall of Moness" in the 19th Century by the Rev. Hugh Macmillan (*Proc. Bot. Soc. Edinb.* 1855: 23-24). This survey extends our knowledge of rock lichens within this site with particular attention to species found on rocks along the river.



Map 1. Birks of Aberfeldy SSSI showing SSSI boundary in red, positions of SCM monitoring plots in red and beech management compartments in blue. See Appendix 3 for detailed maps © Crown copyright and database right 2018. Ordnance Survey 100017908.

2. METHODS

The approach follows that provided in the Statement of Requirements (SNH, 2012).

The site has been split into compartments (Map 1 and Table 1) and general management suggestions have been given for each. Individual 'plots' have also been identified (Appendix 3). These 'plots' represent individual trees and/or rocks that require specific beech management measures. The location of individual 'plots' together with target notes, have been photographed in order to help with relocation (Appendix 1). In addition, to provide a link to previous lichen monitoring on the site, the location of Site Condition Monitoring Direct Monitoring Points (SCM DMP) is sometimes referred to (Douglass, 2013).

Individual trees, boulders and areas are prioritised for local beech management as described in Table 1. This is based on the relative importance of the lichens and the immediacy of threat posed by beech. Notes on the proximity and stage of beech (sapling/semi-mature/mature) are made along with observations where a staged removal (to prevent possible exposure shock) should be considered.

Table 1. Prioritisation categories

Priority #	Priority	Description
1	High priority	species of conservation concern nearby urgent removal required
2	Medium priority	species of conservation concern nearby medium term removal required
3	Low priority	species of conservation concern nearby, long term removal including leaving them to die naturally with selective ring barking of trees in areas assessed not to be a danger to the public.
4	Very Low priority	Long term replace with native species, preferably through natural loss of mature trees and selective ring barking of trees in areas assessed not to be a danger to the public. Regular removal of seedlings and saplings required, preferably on a yearly basis with natural regeneration of native species.

A list of species together with details of their micro-habitat (scale-habitat) was compiled. Locations are provided for all records at an appropriate resolution in the form of an MS Excel spreadsheet and submitted to the British Lichen Society for curation in the national lichen database. This database is available at full resolution via the NBN Atlas (and associated platforms).

While the priority of this contract is to inform the efficient staged removal and control of beech within the SSSI, the contractor was allowed time to explore previously un-surveyed but accessible areas of the site that are not currently threatened by beech. The results of this wider survey is be used to put those areas threatened by beech into context. Details of parts of the SSSI that were not surveyed are also included, including comments on likely lichen habitat.

The lichen interest at the Birks of Aberfeldy is assessed using the East of Scotland Index of Ecological Continuity (ESIEC) (Coppins & Coppins, 2002). This is a list of Indicator species selected to assess the overall conservation interest of woodland sites in Eastern Scotland. ESIEC species are mostly old woodland species of the *Lobarion* community (James *et al.*, 1977). The ESIC is calculated by totalling the relevant indicator species, then adding any

'Bonus' spp., i.e. rare or unusual spp., so giving an overall Total. Totals of 10 or more are considered to be of high conservation importance (Coppins & Coppins, 2002).

In addition, the site is assessed against the soon to be published guidelines for the selection of biological SSSIs.

Table 2. Compartments used to describe the locations of beech management priorities.

Number	Description
1	Between car park and west side of Moness Burn and S. to footbridge.
2	Woodland opposite car park on east side of burn between northern boundary in and footbridge.
3	Between foot-bridge just south of car park to just south of Robert Burns memorial seat.
4	East side of Moness Burn between burn and top of banking east of track.
5	Gently sloping open woodland east of banking above track.
6	East side of Moness Burn up to main falls.
7	Boulders and bedrock upstream of main Falls of Moness.
8	Birch woodland close to track.
9	Ravine section of woodland east of track, west of burn.
10	Deer fenced enclosure, (fence now compromised).

2.1 Field survey team, timing and duration

The survey was carried out by John Douglass who was joined by Dr. Brian Coppins on 16th October 2017 during the aftermath of ex-hurricane Ophelia. The weather conditions on this day were poor with persistent rain and an olive tinge to the sky making conditions for lichen surveying very poor. On 17th – 20th October the surveyor was joined by Dr. Oliver Moore and weather conditions were considerably better, with intermittent sun and cloud and on 26th November on an icy day following heavy snow fall. The site was also visited by the surveyor on 10th March during light rain with some snow still on the ground from a cold easterly weather system named 'The Beast from the East'.

2.2 Survey constraints

The rocks along the river were only intermittently accessible due to snow and ice and high river levels.

2.3 Nomenclature

Lichen nomenclature and conservation evaluations follows Woods and Coppins (2012).

2.4 Key to abbreviations

ESIEC = East of Scotland Index of Ecological Continuity

IR = International Responsibility

NS = Nationally Scarce

NR = Nationally rare

NT = IUCN Red List Category Near Threatened

Vu = IUCN Red List Category Vulnerable

Substrates:

Ap = *Acer pseudoplatanus* (sycamore)
Bry = Bryicolous (on bryophytes)
Bt = *Betula* sp. (birch sp.)
Cort = Corticolous (on bark)
Co = *Corylus avellana* (hazel)
Fg = *Fagus sylvatica* (beech)
Fx = *Fraxinus excelsior* (ash)
Lig = Lignicolous (on dead wood)
Pt = *Populus tremula* (aspen)
Q = *Quercus* (oak)
Sax = Saxicolous (on rock)
Sx = *Salix* (on willow)
Sb = *Sorbus aucuparia* (rowan)
Terr = terricolous (on the ground)
Tw = on twigs
U = *Ulmus* sp. (elm)

DAFOR: Frequency scale:

D = Dominant,
A = Abundant
F = Frequent
O = Occasional
R = Rare

3. RESULTS

3.1 Beech management prioritisation

Beech management Table 4 shows individual plots for trees/groups of trees and rocks with management suggestions for each.

Table 5 shows general management suggestions for the larger compartments.

3.2 Lichen survey and site assessment

Two-hundred and twelve lichen taxa are now known to occur within the Birks of Aberfeldy SSSI. Table 3 summarises the conservation status of these species and a full list of species is presented in Appendix 2.

Table 3. Conservation evaluation summary.

Number of species	212
Scottish Biodiversity List	20
Nationally Rare (UK)	5
Nationally Scarce (UK)	23
Listed on Schedule 8 of the W&CA (Scotland)	0
UK Red data book assessments:	
Near Threatened (NT)	1
Vulnerable (VU)	3
Endangered (EN)	0
Critically Endangered (CR)	0
International responsibility (IR)	17

Taking this and previous survey data into account, the ESIEC site score for the SSSI is 26 + 4 bonus spp. out of a possible score of 30 (Table 6). This is the highest known score for a woodland site with Drummond Wood coming second with (27 + 2 bonus sp.) and in descending order: Milton Wood (25), Ardvorlich Wood (23), Cawdor Wood (20), Glen Tilt (17), Monzie Wood (16), Craighall (15) & Bolfracks Wood & Comrie Woods (14).

New SSSI selection guidelines for lichens are about to be published in the UK (Sanderson *et al.*, 2018). When assessing the complete list of lichens recorded from the site, the following relevant lichen habitat assemblages attain the threshold for selection:

Sub-oceanic woodland assemblage (scores 29 points against a threshold of 20 points). This is based on the presence, within the last 25 years, of:

<i>Arthonia elegans</i>	<i>Chaenotheca chrysocephala</i>	<i>Lopadium disciforme</i>
<i>Arthonia vinosa</i>	<i>Chaenotheca trichialis</i>	<i>Loxospora elatina</i>
<i>Bacidia subincompta</i>	<i>Degelia plumbea s. str.</i>	<i>Megalaria grossa</i>
<i>Biatora chrysantha</i>	<i>Fuscopannaria mediterranea</i>	<i>Megalaria pulvereana</i>
<i>Catinaria atropurpurea</i>	<i>Lobaria pulmonaria</i>	<i>Mycobilimbia epixanthoides</i>
<i>Chaenotheca brunneola</i>	<i>Lobaria scrobiculata</i>	<i>Mycobilimbia pilularis</i>

Nephroma laevigatum
Nephroma parile
Normandina pulchella
Pannaria conoplea

Parmeliella triptophylla
Peltigera collina
Sticta limbata
Sticta sylvatica

Thelotrema lepadinum
Varicellaria hemisphaerica

The Sub-oceanic woodland Index (SWI), used to assess this assemblage, will replace the ESIEC.

Non-montane acid rock assemblage (scores 11 points against threshold of 10 points) due to the presence of *Thelenella larbalestieri*, *Aspicilia laevata*, *Bryobilimbia ahlesii*, *Micarea synotheoides*, *Peltigera degenii*, *Schismatomma umbrinum* (although note that the record of *P. degenii* was recorded out with the 25 year record age limit as specified in the guidance).

Table 4. Specific Beech Management for individual trees or groups of trees and rocks Birks of Aberfeldy

Compartment	Plot	Figure	GPS	Stage and abundance (DAFOR) of beech: Se = Seedling Sa = Sapling Sm = Semi-mature M = Mature	Lichen species of conservation interest plus substrate	Removal priority (Table 1)	Notes
1	1	1 - 4	NN85544847	Se (F), Sa (F), Sm (F), M (F)	<i>Lecidea ahlesii</i> Sax <i>Mycobilimbia epixanthoides</i> Fg	2 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	The beech near the car park are currently providing shade and humidity for these species.
2	2	5 & 6	NN85564840	Se (F), Sa (F), Sm (F), M (O)	<i>Mycobilimbia epixanthoides</i> Fx <i>Thelotrema lepadinum</i> Ap	2 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	Sycamore supports species of conservation interest. Do not remove as it may become an important surrogate for species lost due to ash dieback.
3	3	7	NN85524829	Se (O), Sa (O), Sm (O), M (F).	<i>Degelia plumbea</i> s.str. Fx <i>Leptogium lichenoides</i> Fx, <i>Lopadium disciforme</i> Sx, <i>Peltigera collina</i> Sx,	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	SCM DMP 1 & 2
3	4	14	NN85484821	Se (O), Sa (O), Sm (O), M (F).	<i>Arthonia vinosa</i> Q <i>Bacidia subincompta</i> Fx <i>Mycobilimbia epixanthoides</i> Fx <i>Mycobilimbia pilularis</i> Q <i>Normandina pulchella</i> Fx,Sx,Fg, O <i>Thelotrema lepadinum</i> Fg, Fx, Sx, Co, Q, F	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	SCM DMP 8

Compartment	Plot	Figure	GPS	Stage and abundance (DAFOR) of beech: Se = Seedling Sa = Sapling Sm = Semi-mature M = Mature	Lichen species of conservation interest plus substrate	Removal priority (Table 1)	Notes
3	5	10 & 13	NN85494815	Se (O), Sa (O), Sm (O), M (F).	<i>Mycobilimbia epixanthoides</i> Fg, <i>Peltigera horizontalis</i> Sax (on wall between track and river).	2 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	
3	6	16	NN85514816	Se (O), Sa (O), Sm (O), M (F).	<i>Arthonia vinosa</i> Q <i>Varicellaria hemisphaerica</i> Q	1 for removing semi-mature trees, pulling seedlings and saplings. 2 for mature trees.	
3	7	17 & 18	NN85534809	Se (O), Sa (O), Sm (O), M (F).	<i>Arthonia vinosa</i> Q <i>Varicellaria hemisphaerica</i> Q	1 for removing semi-mature trees, pulling seedlings and saplings. 2 for mature trees.	
4	8	19 & 20	NN8537347906	Se (O), Sa (O), Sm (O), M (O). Frequent ash regen. also needs removing.	<i>Mycobilimbia epixanthoides</i> Sx <i>Nephroma laevigatum</i> Sx <i>N. parile</i> Sx <i>Nephroma resupinatum</i> Sx <i>Sticta limbata</i> Sx	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	Some <i>N. resupinatum</i> appears to have sloughed off with bryophyte mats. Two thalli only remain: One thallus measuring c. 7cm x 6.5cm plus small lobes to right 0.8 x 0.5cm.

Compartment	Plot	Figure	GPS	Stage and abundance (DAFOR) of beech: Se = Seedling Sa = Sapling Sm = Semi-mature M = Mature	Lichen species of conservation interest plus substrate	Removal priority (Table 1)	Notes
4	9	21	NN8532847863	Se (O), Sa (O), Sm (O), M (F).	<i>Leptogium lichenoides</i> , Sx <i>Mycobilimbia epixanthoides</i> Fx <i>Nephroma laevigatum</i> , Fx, Sx, <i>Peltigera collina</i> Co, Fx, Sx <i>Peltigera horizontalis</i> Sx + Mossy logs <i>Protopannaria pezizoides</i> Mossy logs <i>Pyrenula occidentalis</i> Fx <i>Sticta limbata</i> Fx, Sx <i>Thelotrema lepadinum</i> Sx, Fx, Ap	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	DMP 6
4	10	22 - 26	NN85444797	Se (O), Sa (O), Sm (O), M (O).	<i>Normandina pulchella</i> Fx, <i>Parmeliella triptophylla</i> Fx., <i>Peltigera collina</i> Fx <i>Pyrenula occidentalis</i> Fx <i>Sticta sylvatica</i> Fx, Co <i>Thelotrema lepadinum</i> Fx.	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	
4	11	27	NN8543147968	Se (O), Sa (O), Sm (O), M (O).	<i>Lopadium disciforme</i> Sx <i>Megalania pulverea</i> Sx <i>Mycobilimbia epixanthoides</i> Sx <i>Sticta sylvatica</i> Sx	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	

Compartment	Plot	Figure	GPS	Stage and abundance (DAFOR) of beech: Se = Seedling Sa = Sapling Sm = Semi-mature M = Mature	Lichen species of conservation interest plus substrate	Removal priority (Table 1)	Notes
4	12	28 – 30	NN8543347962	Se (O), Sa (O), Sm (O), M (O).	<i>Nephroma laevigatum</i> Sx <i>Parmeliella parvula</i> Sx <i>Protopannaria pezizoides</i> Sx <i>Thelotrema lepadinum</i> Sx	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	New site record for <i>P. parvula</i> .
4	13	31 & 32	NN85334785	No beech seen nearby.	<i>Pannaria conoplea</i> Fx?	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	Last seen in 1986. Tree in Fig. 6 (Douglass 2013). On south face c.30cm above west fork. One thallus c.3cm ² one thallus c. 1.5cm ² plus a few small satellite thalli.
5	14	37 - 39	NN8549947928	Se (O), Sa (O), Sm (O), M (O).	<i>Collema furfuraceum</i> Fx <i>Megalania grossa</i> Fx	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	
5	15	42 – 44	NN85334763	Se (F), Sa (F), Sm (O), M (O).	<i>Nephroma parile</i> Co <i>Normandina pulchella</i> Co <i>Peltigera collina</i> Co <i>Sticta limbata</i> Co <i>S. sylvatica</i> Co <i>Thelotrema lepadinum</i> Co	1 for removing semi-mature trees, pulling seedlings and saplings. 2 for mature trees.	Hazel stools up steep bank.
5	16	45 & 46	NN85344761	Se (O), Sa (O), Sm (O), M (O).	<i>Loxospora elatina</i> Bt <i>Megalania pulverea</i> Bt	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	

Compartment	Plot	Figure	GPS	Stage and abundance (DAFOR) of beech: Se = Seedling Sa = Sapling Sm = Semi-mature M = Mature	Lichen species of conservation interest plus substrate	Removal priority (Table 1)	Notes
5	17	47 & 48	NN85354759	Se (O), Sa (O), Sm (O), M (O).	<i>Varicellaria hemisphaerica</i> Q?	1 for removing semi-mature trees, pulling seedlings and saplings.	Figure 46. Dead? Oak?
5	18	54	NN8548047950	Se (F), Sa (O), Sm (O), M (R).	<i>Lobaria scrobiculata</i> Q <i>Sticta limbata</i> Q	3 for mature trees. 1 for removing semi-mature trees, pulling seedlings and saplings.	SCM DMP 10
5	19	55	NN8551647968	Se (F), Sa (O), Sm (O), M (R).	<i>Lobaria scrobiculata</i> Sx <i>Lopadium disciforme</i> Sx <i>Megalania pulverea</i> sx	3 for mature trees. 1 for removing semi-mature trees, pulling seedlings and saplings.	SCM DMP 9
5	20	57	NN85344777	Se (F), Sa (O), Sm (O), M (O).	<i>Arthonia vinosa</i> Bt <i>Chaenotheca trichialis</i> Bt <i>Calicium viride</i> Bt <i>Chaenotheca chrysocephala</i> Bt <i>Chaenotheca ferruginea</i> Bt <i>Lopadium disciforme</i> Bt	3 for mature trees. 1 for removing semi-mature trees, pulling seedlings and saplings.	
5	21	58	NN85394789	Se (F), Sa (O), Sm (O), M (O).	<i>Varicellaria hemisphaerica</i> Q	3 for mature trees. 1 for removing semi-mature trees, pulling seedlings and saplings.	
5	22	60	NN85324770	Se (F), Sa (O), Sm (O), M (O).	<i>Bryobilimbia ahlesii</i> Sax <i>Verrucaria rosula</i> Sax	2 for mature trees. 1 for removing semi-mature trees, pulling seedlings and saplings.	Rocks in burn.

Compartment	Plot	Figure	GPS	Stage and abundance (DAFOR) of beech: Se = Seedling Sa = Sapling Sm = Semi-mature M = Mature	Lichen species of conservation interest plus substrate	Removal priority (Table 1)	Notes
6	23	61	NN8525547637	Se (O), Sa (O), Sm (O), M (O).	<i>Sticta sylvatica</i> Sb	3 for mature trees. 1 for removing semi-mature trees, pulling seedlings and saplings and removal of overhanging branches from mature beech.	
7	24	65 & 66	NN85134717	Se (R), Sa (R), Sm (R).	<i>Ionaspis lacustris</i> with the lichenicolous fungus <i>Sagediopsis lomnitzensis</i> <i>Verrucaria rosula</i> Sax	3 for mature trees. 1 for removing semi-mature trees, pulling seedlings and saplings.	
8	25	69	NN8524647755	Se (F), Sa (F), Sm (O), M (O).	<i>Bacidia subincompta</i> Fx <i>Leptogium lichenoides</i> Fx <i>Mycobilimbia epixanthoides</i> Fx <i>Cetraria sepincola</i> Bt Tw lichenicolous fungi <i>Tremella coppinsii</i> (new site record) on <i>Platismatia glauca</i> on birch.	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	Close to track
8	26	70 & 71	NN8523747722	Se (F), Sa (F), Sm (O), M (O).	<i>Bacidia subincompta</i> Q	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	Not far from track

Compartment	Plot	Figure	GPS	Stage and abundance (DAFOR) of beech: Se = Seedling Sa = Sapling Sm = Semi-mature M = Mature	Lichen species of conservation interest plus substrate	Removal priority (Table 1)	Notes
9	27	72	NN85254778	Se (F), Sa (F), Sm (O), M (O).	<i>Peltigera horizontalis</i> <i>Thelotrema lepadinum</i>	1 for removing semi-mature trees, pulling seedlings and saplings.	
10	28	80	NN85374803	Se (F), Sa (F), Sm (O), M (O).	<i>Arthonia vinosa</i> Q <i>Megalania pulverea</i> Q	3 for mature trees. 1 for removing semi-mature trees, pulling seedlings and saplings.	
						3 for mature trees.	

Table 5. General beech management for compartments (Table 2).

Compartment	Stage and abundance (DAFOR) of beech: Se = Seedling Sa = Sapling Sm = Semi-mature M = Mature	Lichen species of conservation interest plus substrate & DAFOR	Removal priority (Table 1)	Notes on beech e.g. felling, staged removal where providing humidity.
1	Se (F), Sa (F), Sm (F), M (F)	<i>Lecidea ahlesii</i> Sax, O <i>Melanohalea laciniatula</i> (local) Fg, R <i>Melanohalea exasperata</i> (local) Fg, R <i>Mycobilimbia epixanthoides</i> Fg, O	2 for removing semi-mature trees, pulling seedlings and saplings. 4 for mature trees	
2	Se (F), Sa (F), Sm (F), M (O)	<i>Mycobilimbia epixanthoides</i> Fx, O <i>Opegrapha rufescens</i> (local) Fx, O <i>O. soreliifera</i> (local) Ap, O <i>Thelotrema lepadinum</i> Ap, O	2 for removing semi-mature trees, pulling seedlings and saplings. 4 for mature trees	
3	Se (O), Sa (O), Sm (O), M (F). Saplings plus seedlings near DMP 1 and 2 plus mature trees west side of track and on banking above (E side) of track.	<i>Arthonia vinosa</i> Q, F <i>Bacidia subincompta</i> Fx, R <i>Degelia plumbea</i> s.str. Fx R <i>Leptogium lichenoides</i> Fx, R <i>Lopadium disciforme</i> Q, O <i>Mycobilimbia epixanthoides</i> Fx,Sx,Fg, O <i>Mycobilimbia pilularis</i> Q, R <i>Normandina pulchella</i> Fx,Sx,Fg, O <i>Opegrapha ochrocheila</i> Fx, R <i>O. soreliifera</i> Fx, R <i>Peltigera collina</i> Sx, R <i>Pertusaria hemisphaerica</i> Q, R <i>Thelotrema lepadinum</i> Fg, Fx, Sx, Co, Q, F <i>Varicellaria hemisphaerica</i> Q, R	1 for removing semi-mature trees, pulling seedlings and saplings. 3 for mature trees.	It would be advantageous to open up sections along the river in areas with large boulders and large sections of exposed bedrock to allow more light onto river rocks and increase habitat availability for lichens.

4	Se (O), Sa (O), Sm (O), M (F).	<i>Arthonia vinosa</i> Q, F <i>Bacidia carneoglauca</i> Sax, R <i>Lopadium disciforme</i> Q, F <i>Mycobilimbia epixanthoides</i> Fx,Sx, O <i>Nephroma laevigatum</i> Sx, Fx, O <i>N. resupinatum</i> Sx, R <i>Normandina pulchella</i> Co, Bt, Fx <i>Pannaria conoplea</i> Fx, R <i>Parmeliella parvula</i> Sx, R <i>P. triptophylla</i> Fx,R <i>Peltigera collina</i> Sx,Q,Co,Sb, O <i>Peltigera horizontals</i> Sx, R <i>Protopannaria pezizoides</i> Sx, O <i>Pyrenula occidentalis</i> Fx,R <i>Sticta limbata</i> Sx, R <i>Sticta sylvatica</i> Fx ,Co,Sb,Q, O <i>Thelotrema lepadinum</i> Co,Fg,Q,Fx,Sx,Bt, F	<p>1 for removing semi-mature trees, pulling seedlings and saplings.</p> <p>3 for mature trees.</p>
5	Se (O), Sa (O), Sm (O), M (O).	<i>Arthonia vinosa</i> Q, Bt, F <i>Biatora chrysantha</i> Cort+Bry on Co,Q,Sx, O. <i>Collema furfuraceum</i> Fx, R. <i>Chaenotheca chrysocephala</i> Bt, R <i>C. ferruginea</i> Bt,Q,Lx, F <i>C. trichialis</i> Bt,Q,Lx, F <i>Chaenothecopsis savonica</i> Q, R <i>Lobaria scrobiculata</i> Q,Sx, R <i>Lopadium disciforme</i> Q,Bt,Sx, F <i>Megalaria grossa</i> Fx,Pt, R <i>M. pulvereae</i> Fx,Sx,Q,Bt,Pt, F <i>Mycobilimbia epixanthoides</i> Fx,Sx,Fg, O. <i>Nephroma laevigatum</i> Fx,Sx, O <i>N.parile</i> Sx,Co, R <i>Peltigera collina</i> Co,Fx,Sx,Ap, F <i>Pertusaria hemisphaerica</i> Q, R <i>Sphaerophorus globosus</i> Bt, R <i>Sticta sylvatica</i> Fx ,Co,Sb,Q, O <i>Thelotrema lepadinum</i> Co,Fg,Q,Fx,Sx,Bt, F	<p>1 for removing semi-mature trees, pulling seedlings and saplings.</p> <p>3 for mature trees.</p>

6	Se (F), Sa (F), Sm (F), M (F)	<i>Arthonia vinosa</i> Q, F <i>Chaenotheca furfuraceum</i> Lx, R <i>Sticta sylvatica</i> Sb, R <i>Thelotrema lepadinum</i> Q, Bt, O <i>Trapelia corticola</i> Q, R	<p>2 for removing semi-mature trees, pulling seedlings and saplings.</p> <p>4 for mature trees.</p>	
7	Se (F), Sa (F), Sm (F), M (F)	<i>Leptogium lichenoides</i> Fx, R <i>Sagediopsis lomnitzensis</i> (Lic) ? <i>Stenocybe pullatula</i> (local) O <i>Trapelia corticola</i> Al Lig, R <i>Verrucaria rosula</i> Sax, O	<p>2 for removing semi-mature trees, pulling seedlings and saplings.</p> <p>4 for mature trees.</p>	
8	Se (F), Sa (F), Sm (o), M (o)	<i>Arthonia vinosa</i> Bt, Q, O <i>Bacidia subincompta</i> Q, R <i>Calicium viride</i> Bt, O <i>Cetraria sepincola</i> Bt Tw, R <i>Chaenotheca ferruginea</i> Q, Bt, F <i>C. trichialis</i> Bt, O <i>Thelotrema lepadinum</i> Bt, Q, O	<p>1. for removing all beech above ravine woodland (compartment 9) to prevent regen. into ravine. Some regen may be occurring on the steep banks but no access was possible.</p> <p>2 for removing semi-mature trees, pulling seedlings and saplings within birch woodland.</p> <p>4 for mature trees within birch woodland.</p>	<p>Mature trees are already being removed from the northern section of this compartment. Continue to remove these trees.</p>
9	Se (o), Sa (o), Sm (o), M (O).	<i>Biatora chrysantha</i> Co, R <i>Leptogium lichenoides</i> Sb,Fx, O <i>Lobaria pulmonaria</i> Co, Sb, R <i>Mycobilimbia epixanthoides</i> Fx, R <i>Nephroma laevigata</i> <i>Normandina pulchella</i> <i>Peltigera collina</i> Sb,Co,Sx,Fx,, F <i>Scoliciosporum umbrinum</i>	<p>1 for removing semi-mature trees, pulling seedlings and saplings.</p> <p>2 for mature trees.</p>	<p>No beech regen seen in ravine section supporting good Lobaria community but need to remove beech and beech regen from birch woodland compartment 8 opposite ravine asap.</p>

Sticta fuliginosa Sb, R
S. limbata Co, Fx, O
S. sylvatica Sb, Co, F
Thelenella larbalestieri Sax, R

Some beech regen was seen in
ravine section to the north of good
Lobarion section in figs 72 - 78.

- | | | | |
|----|--------------------------------|--|---|
| 10 | Se (A), Sa (F), Sm (o), M (F). | <i>Arthonia vinosa</i>
<i>Megalaria pulverea</i>
<i>Thelotrema lepadinum</i> | 4 for mature trees.
2 for removing semi-mature trees,
pulling seedlings and saplings. |
| 11 | Se (F), Sa (F), Sm (F), M (F) | <i>Arthonia vinosa</i>
<i>Thelotrema lepadinum</i> | 4 for mature trees.
2 for removing semi-mature trees,
pulling seedlings and saplings. |
-

Table 6. ESIEC species recorded for Birks of Aberfeldy.

<i>Arthonia elegans</i> #	<i>Lobaria pulmonaria</i>
<i>Arthonia vinosa</i>	<i>Lobaria scrobiculata</i>
<i>Bacidia beckhausii</i> #	<i>Lopadium disciforme</i>
<i>Bacidia circumspecta</i> B #	<i>Loxospora elatina</i>
<i>Bacidia subincompta</i>	<i>Megalaria grossa</i>
<i>Biatora chrysantha</i>	<i>Megalaria pulverea</i>
<i>Catinaria atropurpurea</i> #	<i>Mycobilimbia epixanthoides</i>
Caliciales*:	<i>Mycobilimbia pilularis</i>
<i>Calicium glaucellum</i> #	<i>Nephroma laevigatum</i> & <i>N. parile</i> *
<i>C. viride</i>	<i>Nephroma resupinatum</i> B
<i>Chaenothecopsis savonica</i> +	<i>Normandina pulchella</i>
<i>Chaenotheca trichialis</i>	<i>Pannaria conoplea</i>
<i>C. furfuracea</i>	<i>Parmeliella triptophylla</i>
<i>C. ferruginea</i>	<i>Peltigera collina</i>
<i>C. chrysocephala</i>	<i>Pseudocyphellaria crocata</i> B #
<i>C. brunneola</i> #	(Not seen since 1855)
<i>Stenocybe pullatula</i> *	<i>Sticta limbata</i>
<i>Collema furfuraceum</i> B +	<i>Sticta sylvatica</i> & <i>S. fuliginosa</i> *
<i>Degelia plumbea</i> s. str.	<i>Thelotrema lepadinum</i>
<i>Fuscopannaria mediterranea</i> #	<i>Varicellaria</i> (syn. <i>Pertusaria</i>) <i>hemisphaerica</i>

B = Bonus species: additional significant local or rare species not included in the ESIEC base list.

+ = Additions to the list in 2017-18

= Not recorded in 2017-18

* = Grouped species score just one point if any one species present.

4. DISCUSSION

The beech trees at the Birks are a major feature of its character and their removal needs to be undertaken as discreetly as possible. Beech casts a dense shade which has a negative impact on lichen establishment and growth. Beech also provides humidity which can be advantageous to bryophyte growth at the expense of lichens. However, quick large scale removal is likely to cause exposure shock where bryophyte mats become desiccated and slough off the host trees, taking the lichens growing on these mats with them. Therefore any felling of mature trees close to lichen communities of conservation importance needs to be undertaken gradually to reduce any sudden changes in local conditions.

Methods that leave standing and falling dead wood on site should be considered. Ring-barking of selected mature beech trees is advised in areas which are not deemed to be a risk to the public, should the affected trees fall. Another technique commonly used is stem injection with herbicide. Ring-barking would reduce the initial visible impact as well as reducing any initial shock effect on the lichens by maintaining some level of shade. This site is known for its populations of pinhead lichens which grow on oak and birch deadwood. The site is relatively poor in deadwood habitat at present, and the provision of extra standing deadwood through ring barking beech would help remedy this. Ring barking should be done in stages over several years. Care should be taken not to ring bark trees close to the main track to avoid dead trees falling close to tracks and avoid the need to remove fallen trunks from the main track. In addition a few mature beech trees have been targeted to be felled in order to increase light levels to nearby native trees supporting species of lichens of conservation concern, where ring barking may result in the beech falling on these trees.

Before any ring-barking or stem injection is undertaken the beech mast below the trees should be checked to see if it has viable seeds or not (Smout, 1997). Some veteran trees do not produce viable seeds and such trees could be given a low priority for removal unless they are directly affecting sites with lichen conservation interest.

There was an element of lichen interest on the beech trees themselves. *Melanohalea laciniatula* (a relatively common lichen) which was a new site record was found only on beech twigs in the car park area. Species of conservation interest were also found on beech including *Mycobilimbia epixanthoides* and *Thelotrema lepadinum*, however both of these species were also found on several other tree. The loss of beech at this site would not cause any concern regarding the loss of any lichen species of conservation interest.

Sycamore can also support species of conservation interest. At this site they are a more important lichen host than beech even though there are far fewer of them. Species of conservation interest found on sycamore include *Loxospora elatina* (found on only two trees at this site), *Peltigera collina* and *Thelotrema lepadinum*. If ash dieback takes its toll on the ash trees here, sycamore can act as an important surrogate host to species of conservation interest which grow on ash. Sycamore should be encouraged at this site and may self-seed in gaps provided by the loss of beech.

4.1 Felling

Felling of mature trees should only be undertaken if there is an immediate threat to the loss of lichens of high conservation importance.

4.2 Natural loss

Long term replacement of beech with native species is recommended over decades, preferably through natural loss of mature trees and natural regeneration of native trees.

4.3 Removal of seedlings, saplings and semi mature trees

Regular removal of seedlings and saplings will be necessary, preferably on a yearly basis. A few dozen seedlings and small saplings were pulled out during the survey. The seedlings are easily removed but some of the larger saplings have well anchored roots and would require digging out. Removal of semi mature trees would require a chainsaw and stump treatment.

4.4 Other threats

Rhododendron ponticum does not appear to have invaded the woodland and is currently not a problem.

During the survey no gold panning was encountered but this could have a negative impact on aquatic species if boulders are disturbed or turned over.

The proposed hydro-scheme was granted planning permission in 2009 however this has never been enacted. Extraction of water is likely to have a negative impact on freshwater lichens.

Whilst in the woodland Oliver Moore came across a group of people involved in Geocaching, turning over logs and stones and disturbing bryophyte cushions. Some deadwood and terricolous lichens, bryophytes, fungi and invertebrates may suffer due to this activity. It is not known how common and how much disturbance Geocaching has at this site.

5. CONCLUSIONS

Our knowledge of this site has been increased considerably due to this survey work with 45 additional taxa including several species of conservation concern.

Beech trees and regeneration close to native trees supporting lichens of conservation importance are prioritised for pulling or felling.

Ring barking is recommended for beech trees away from the main track. This should be done gradually over several years and will increase light levels for lichens of conservation importance as well as providing much needed deadwood habitat for the SSSI.

The unusually straight and tall willows are a very important phorophytes (host trees) for lichens of conservation interest at this site and support several Lobarion species including *Nephroma resupinatum*, thought extinct in the UK, a small specimen of which was lodged at RBGE for molecular analysis.

Further survey work is recommended for the rocks in the river due to high water levels and snow and ice. Freshwater lichen work is best done in drought conditions during spring and summer.

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APPENDIX 1: PLOTS AND TAGET NOTES

Compartment 1



Figure 1. Plot 1. Lecidea ahlesii (O) on boulders below beech and Mycobilimbia epixanthoides (R) on bryophytes on beech trunks & Melanohalea exasperata and M. laciniatula (new site records) on beech twigs. Melanohalea exasperata was also found on ash twigs in compartment 3. Compartment 1 is a low priority for beech removal as few lichens of conservation interest were found here and Lecidea ahlesii requires some shade currently produced by the beech. The mature beech should be removed over several years allowing native trees to regenerate and provide shade for the lichens on the boulders. Photograph from southern edge of car park looking south from NN 8554 4847.



Figure 2. Plot 1. Lecidea ahlesii (O) on boulders in picture above.



Figure 3. Plot 1. Melanohalea laciniatula (new site records) on beech twig.



Figure 4. Plot 1. Beech saplings growing just downstream from bridge. The beech here is of low priority for removal but it would be worth removing the saplings and seedlings before they grow much bigger and begin producing viable seeds. Picture taken from bridge looking N towards car park. NN 8553 4838.

Compartment 2



Figure 5. Plot 2. The majority of beech is in the northern section of this compartment, towards the road. This section is of low priority for beech removal as few lichens of conservation interest were found here. Looking downstream from bridge. NN 8553 4838.



*Figure 6. Plot 2. Copse of secondary woodland opposite car park supporting the notable lichens *Mycobilimbia epixanthoides* and *Opegrapha rufescens* on ash and *Opegrapha sorediifera* and *Thelotrema lepadinum* on sycamore. This section of compartment 2 appears to be beech free but would need checking yearly and any beech regen. removed. Photograph orientation N.*

Compartment 3



Figure 7. Plot 3. Beech seedlings and saplings are growing close to DMP 1 (leaning willow, centre) & 2 (ash, centre right) and need to be removed before they begin to shade out the lichens on these trees. NN 8551 4826. Photograph orientation S.

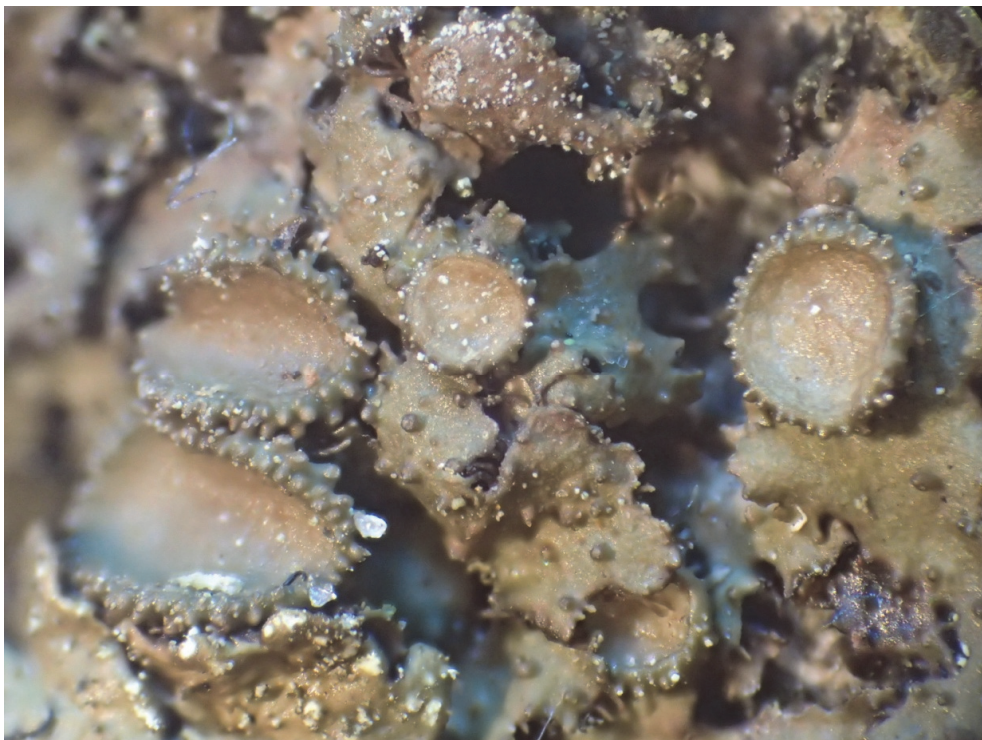


Figure 8. Melanohalea exasperata found on a fallen ash branch. This is a new species for the SSSI.



*Figure 9. DMP 8. Ash supporting *Bacidia subincompta* & *Normandina pulchella*. Oak supporting *Arthonia vinosa*, *Mycobilimbia pilularis* and *Leptogium lichenoides*. NN 8548 4821. View direction SE.*



Figure 10. Plot 5. Mature Beech plus ash (left) along the Urlar Burn. The Beech here should be removed over a period of years to allow more light onto the rocks along the burn and reduce leaf litter on the rock habitats here. Photograph orientation S at NN 8546 4815 just south of Burns seat.



Figure 11. Plot 5. Mycobilimbia epixanthoides on the moss Hypnum andoi on beech near the Burns seat. Both Mycobilimbia epixanthoides and Thelotrema lepadinum are old woodland ESIEC species which grow on beech at Aberfeldy. However these species also grow on a number of native tree species at this site and the loss of beech will not threaten these species at this site.

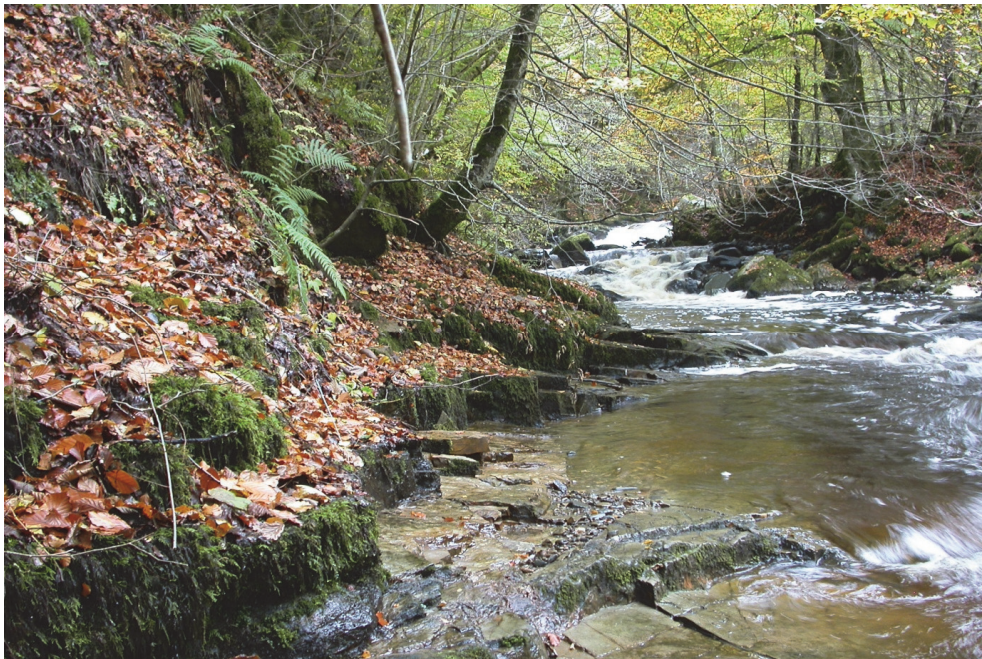


Figure 12. Plot 5. Rock shelves with a dense covering of beech leaves which when removed show a distinct lack of lichen colonisation due to excessive shade from the dense beech canopy above and the persistence of the leaves covering the rocks during autumn and winter. Lower section west side of Urlar burn just upstream from Robert Burns statue. NN 8547 4811. Photograph orientation S.



Figure 13. Plot 5. Mossy boulders in Urlar Burn heavily shaded by beech canopy. The boulders downstream support species such as Porina chlorotica, P. lectissima and Porpidia cinereoatra. If some mature beech were removed along sections such as this it would increase the potential for lichen colonisation on boulders and bedrock in the splash, amphibious and aquatic zones. Increasing habitat for species associated with freshwater rock habitats. Photograph orientation S.



Figure 14. Plot 4. DMP 8. Ash supporting Bacidia subincompta & Normandina pulchella. Oak supporting Mycobilimbia pilularis and Leptogium lichenoides & oak supporting Arthonia vinosa. Beech is regenerating near this tree and should be removed regularly. NN 8549 4820. View direction SE. Parmeliella triptophylla was found in this area at NN in 2012 but despite a search it was not re-found.



Figure 15. *Opegrapha ochrocheila* found on fallen ash in compartment 3. NN 85461 48162.



Figure 16. Plot 6. Oak supporting *Arthonia vinosa* plus *Pertusaria hemisphaerica* (white strip on oak right). NN 8551 4816. View direction N.



*Figure 17. Plot 7. Mature beech west of track. The oak behind this supports *Arthonia vinosa* and *Pertusaria hemisphaerica*. NN 8553 4809. Photograph orientation S.*



*Figure 18. Plot 7. *Pertusaria hemisphaerica* on the oak in the photograph above. This old woodland ESIEC species was found on only 3 oaks within the SSSI.*

Compartment 4



Figure 19. Plot 8. Willow (DMP 4) supporting Nephroma resupinatum, N. laevigatum, N. parile and Sticta limbata. NN 85376 47915.



Figure 20. Plot 8. Nephroma resupinatum (DMP 4). A specimen has been lodged with the Botanic Garden in Edinburgh for molecular analysis.



*Figure 21. Plot 9. DMP 6. Ash supporting *Pyrenula occidentalis*. Picture taken at NN 85328 47863 looking 30° NNE.*



*Figure 22. Plot 10. Ash (centre, right) supporting *Normandina pulchella*, *Parmeliella triptophylla*, *Peltigera collina*, *Pyrenula occidentalis*, *Sticta sylvatica* and *Thelotrema lepadinum*. The hazels stool (far right) also supports *Sticta sylvatica*. The mature oak just west of the track (left) supports *Arthonia vinosa* and *Lopadium disciforme*. Beech are seeding and regenerating in this area. These seedlings, saplings are semi mature beech should be removed asap. View direction NNE.*



*Figure 23. Plot 10. Ash also seen in photograph above showing large patches of *Parmeliella triptophylla* (centre left) and *Peltigera collina* (bottom centre). View direction NNE.*



*Figure 24. Plot 10. *Parmeliella triptophylla* on ash in picture above. This old woodland ESIEC & IR species is rare at this site.*



Figure 25. Plot 10. Peltigera collina on ash in picture above. This old woodland ESIEC species was occasional at this site on oak, willow, ash, rowan, hazel and sycamore.



Figure 26. Plot 10. Sticta sylvatica on fallen hazel stem in picture above. This old woodland ESIEC species was occasional on oak, ash, rowan and hazel.



*Figure 27. Plot 11. Mature three stemmed willow by Oliver Moore supporting *Lopadium disciforme*, *Megalaria pulverea*, *Mycobilimbia epixanthoides* and *Sticta sylvatica*. These large straight willows can compete with ash and oak for canopy space and are a very important host for species of conservation concern within the SSSI. NN 85431 47968. View direction W.*



*Figure 28. Plot 12. Willow with Oliver pointing to *Parmeliella parvula* (new record for the SSSI). This willow also supports *Nephroma laevigatum*, *Protopannaria pezizoides* and *Thelotrema lepadinum*. NN 85433 47962. View direction W.*



Figure 29. Plot 12. Parmeliella parvula on willow in photograph above. Three small patches were noted on the east face of this willow. This IR member of the Lobarion community is a new record for this SSSI.



Figure 30. Plot 12. Nephroma laevigatum on willow in photograph above. This is ESIEC and IR species of the Lobarion community was occasional at this site on ash and willow.



Figure 31. Plot 13. Ash supporting a few thalli of Pannaria conoplea. This species of the Lobarion community was last recorded for this site in 1986.



Figure 32. Plot 13. Pannaria conoplea on ash in picture above.

Compartment 5



Figure 33. Oak supporting Biatora chrysantha, Lopadium disciforme and a large fertile patch of Megalaria pulverea (pointed at by Oliver Moore). This compartment supports frequent Lopadium disciforme and Arthonia vinosa on oak. Sphaerophorus globosus (a new record for the site) was found on a birch nearby at NN 8556 4800. Beech regeneration is occasional to locally frequent. Photograph orientation E. NN 8557 4793.



Figure 34. Fertile Megalaria pulverea on oak above. This old woodland ESIEC species was rare to occasional at this site on oak, willow and ash.



Figure 35. Biatora chrysantha on oak above.



Figure 36. Lepraria rigidula on birch in compartment 5. New species for the SSSI.



*Figure 37. Plot 14. Mature ash supporting *Lecanora argentata*, *Megalaria grossa* and *Collema furfuraceum* and *Leptogium lichenoides*. Beech regeneration is frequent in this area. Any beech regen. should be regularly cleared from this section. NN 8549 4792. View direction NE.*



*Figure 38. Plot 14. *Megalaria grossa* on ash above. This old woodland ESIEC species was last recorded in 1986.*

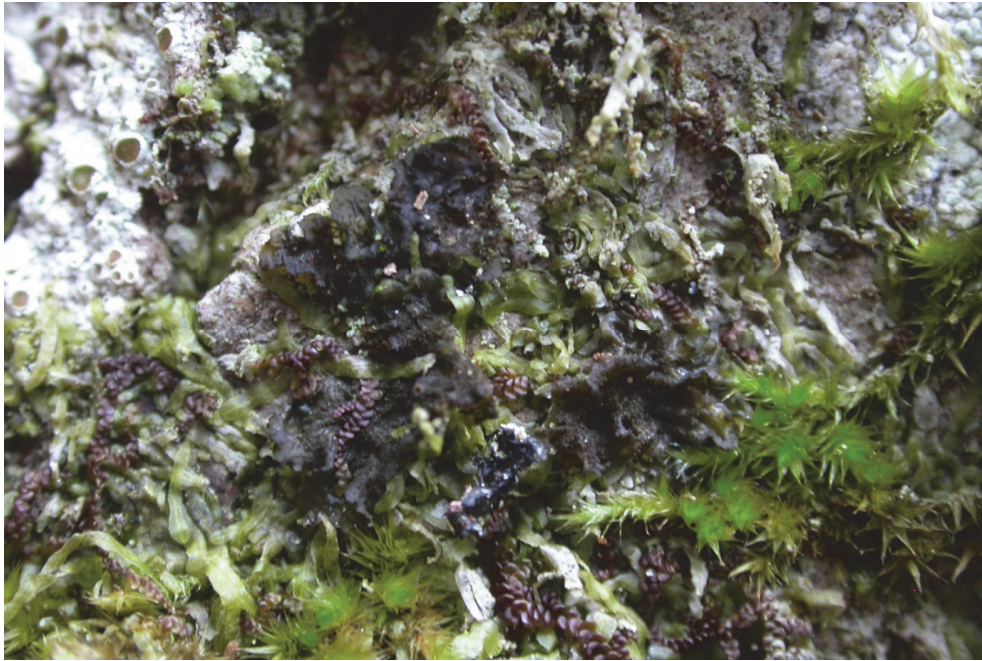


Figure 39. Plot 14. *Collema furfuraceum* on ash above. A new site record for this old woodland ESIEC species.



Figure 40. Oak and birch with frequent beech regen. The oak here support the old woodland species *Arthonia vinosa* and *Lopadium disciforme*. The fallen tree in the foreground supports the old woodland species *Peltigera horizontalis*. *Tuckermannopsis chlorophylla* was also found here on birch twigs. The regenerating beech here needs to be removed asap. Photograph taken at NN 85340 47616 looking NW.



Figure 41. Lopadium disciforme on oak. This old woodland species was surprisingly frequent on oak throughout the SSSI.



Figure 42. Plot 15. Hazel stools up steep bank supporting Sticta limbata (a few small thalli), S. sylvatica (abundant), Nephroma parile (single thallus on left hand stool), Normandina pulchella (occasional), Peltigera collina (frequent) & Thelotrema lepadinum (frequent). The left hand stool supports 100+ thalli of Sticta sylvatica. A young ash in between the hazel stools also supports P. collina & S. sylvatica. Photograph taken at NN 85335 47638 looking NW.



Figure 43. Plot 15. *Sticta limbata* on hazel stool in photograph above.



Figure 44. Plot 15. *Peltigera collina* on hazel stool in photograph above.



Figure 45. Plot 16. Birch left (near Oliver) supporting Loxospora elatina and Megalaria pulvereae. Large straight, mature aspen (right) supporting Megalaria grossa. A group of mature/semi mature beech can be seen in the distance behind Patch. Beyond the beech is a group of hazel stools supporting a good Lobarion community (see figures above). Photograph taken at NN 85340 47616 looking NW.



Figure 46. Plot 16. Old woodland species Loxospora elatina on birch in photograph above.



Figure 47. Plot 17. Dead? Oak? near Oliver and Patch supporting Arthonia vinosa and Pertusaria hemisphaerica. NN 8535 4759. Looking west.



Figure 48. Plot 17. Old woodland species Pertusaria hemisphaerica on oak? in photograph above.



Figure 49. Veteran birch supporting old woodland Pin Head lichens Calicium viride, Chaenotheca ferruginea and C. trichialis. Photograph taken at NN 85424 47578 looking NE.



Figure 50. Chaenotheca trichialis with Chrysothrix candelaris on veteran birch above.



Figure 51. Calicium viride on veteran birch above.



Figure 52. Oliver standing at ash (right) and rowan (left) growing out of a massive old stump. The ash here supports large quantities of Peltigera collina on its trunk. Ash twigs support Melanohalea exasperata and Rinodina sophodes both of which are new records for the SSSI. NN 85467 47594. View direction NE.



Figure 53. *Lecanora intumescens* (new site record) found on the ash above. The right hand section has been treated with Pd to help identify this species. The white pruina on the apothecia also helps to distinguish this species from other *Lecanora* species.



Figure 54. Plot 18. DMP 10. Oak supporting *Lobaria scrobiculata* and *Sticta limbata*. Beech is regenerating near this tree and should be removed regularly. NN 85480 47950. View direction SE.



Figure 55. Plot 19. DMP 9. Willow supporting Bacidia absistens, Lobaria scrobiculata, Lopadium disciforme and Megalaria pulverea. Beech is regenerating near this tree and should be removed regularly. NN 85516 47968. View direction N.



Figure 56. The NR and NT Pin Head lichen Chaenothecopsis savonica (black pin heads, centre) a new record for the SSSI & Chaenotheca trichialis (pin heads with brown heads) found at the base of an oak NN 85524 48080.



*Figure 57. Plot 20. Birch with twisted bark supporting *Chaenotheca chrysocephala* and *Chaenotheca ferruginea*. NN 8534 4777. View direction SSW.*



*Figure 58. Plot 21. Oak supporting *Pertusaria hemisphaerica*. The mature and semi mature beech nearby should be ring barked and saplings and seedlings removed. NN 8539 4789. View direction N.*



*Figure 59. Veteran oak supporting the old woodland indicators *Arthonia vinosa* and *Trapelia corticola* together with *Lecanactis abietina* (grey/whitish streaks) and *Chrysothrix candelaris* (yellow streaks). A willow nearby supports *Lopadium disciforme*, *Megalaria pulverea* and *Mycobilimbia epixanthoides*. Frequent beech regen is apparent nearby. NN 85313 47653. View direction due N.*



*Figure 60. Plot 22. Stream with boulders supporting *Bryobilimbia ahlesii*, *Verrucaria hydrophila* and *V. rosula*. Beech regen. in this area is occasional to frequent. NN 8532 4770. View direction NW.*

Compartment 6



*Figure 61. Plot 23. Rowan east of burn supporting *Sticta sylvatica*. Beech regeneration is frequent here and should be removed asap. Mature beech nearby should also be removed along with overhanging beech branches. NN 85255 47637. View direction N.*



Figure 62. Abundant beech regen either side of track in the vicinity of the viewing area for the main Falls of Moness. NN 85270 47577. View direction SSW. This beech regeneration should be removed.



Figure 63. Mature larch near steps supporting Buellia schaereri (new site record), Chaenotheca furfuraceum and C. trichialis. NN 85301 47513. View direction S.

Compartment 7

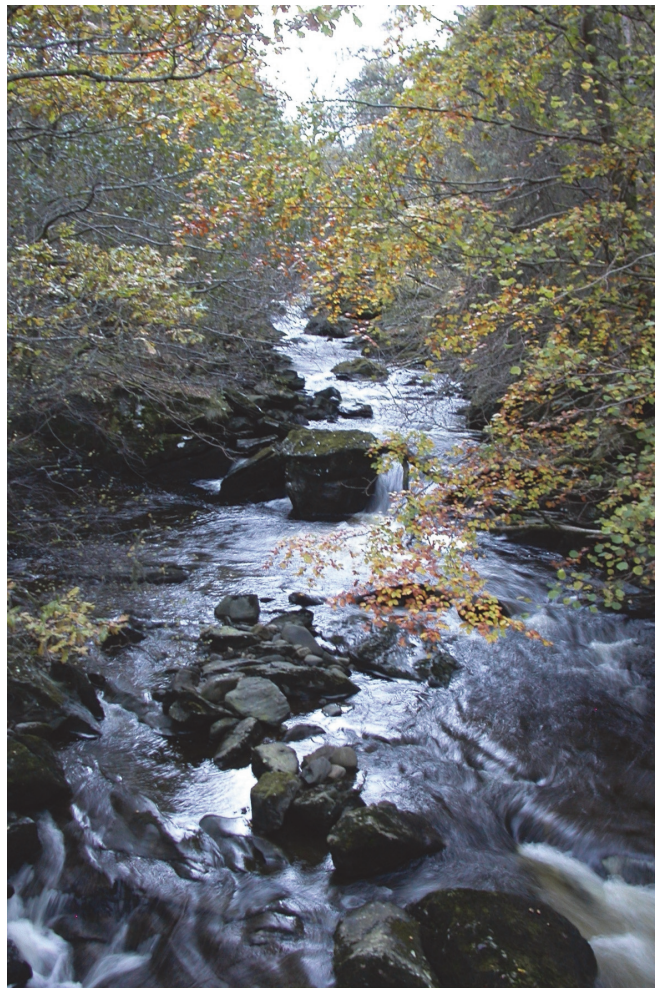


Figure 64. Boulders and bedrock upstream of main Falls of Moness supporting species such as Aspicilia caesiocinerea, Baeomyces rufus, Ionaspis lacustris with the lichenicolous fungus Sagediopsis lomnitzensis (new site record), Parmelia saxatilis, Pertusaria corallina, Porpidia rugosa, Rhizocarpon lavatum, R. reductum, Trapelia placodioides and Verrucaria hydrophila (new site record) & V. rosula (new site record). Leptogium lichenoides on ash; Stenocybe pullatula on alder and Trapelia corticola was found on the lignum of a hollowed alder trunk. The mature and semi mature beech are throwing heavy shade in the area and should be ring barked. The younger beech trees and seedlings should be pulled out. Photograph taken from bridge looking SW at NN 8518 4726.

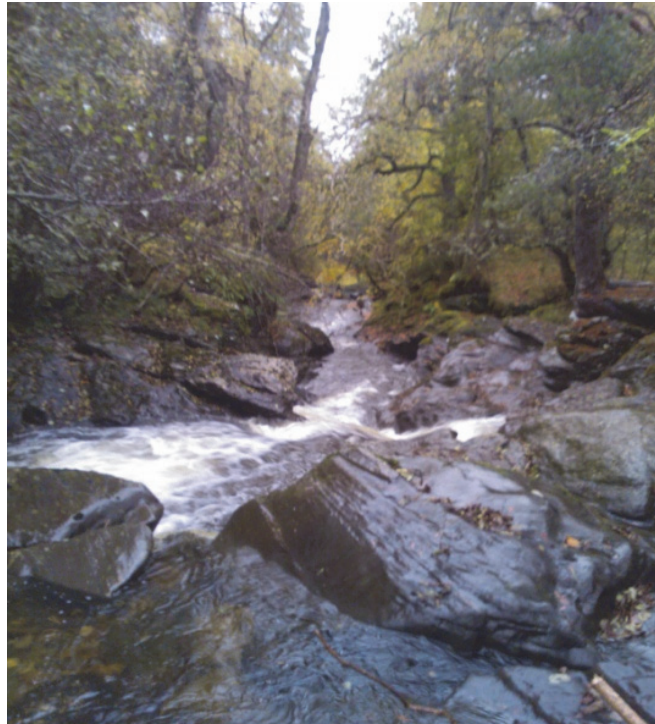


Figure 65. Plot 24. River rocks above main waterfall supporting species of conservation concern. NN 8513 4717. View direction NE.



Figure 66. Verrucaria rosula (?NR, new site record) found at Birks of Aberfeldy on damp rocks at edge of river at c.3m above water level. NN 8513 4719.

Compartment 8



Figure 67. Birch woodland with frequent beech regen.



Figure 68. Beech regen above ravine section 9 supporting a good Lobarion community. This regen. and any mature trees in this area should opposite section 9 should be removed asap. Any regen. in the ravine to the east of the track should be prioritised for removal. NN 85204 47276. View direction NNE.



Figure 69. Plot 25. Ash (left) supporting Bacidia subincompta, Leptogium lichenoides and Mycobilimbia epixanthoides. Cetraria sepincola was also found on fallen birch twigs here together with the lichenicolous fungi Tremella coppinsii (new site record) on Platismatia glauca on birch. NN 85246 47755. View direction SSE.



Figure 70. Plot 26. Oak supporting Bacidia subincompta. Beech regen should be removed from this tree as a high priority. NN 85237 47722.



Figure 71. Plot 26. Bacidia subincompta on oak in picture above.

Compartment 9



*Figure 72. Plot 27. Beech regen. in area supporting the old woodland species *Peltigera horizontalis* and *Thelotrema lepadinum*. NN 85252 47783. View direction SE.*



*Figure 73. Oliver pointing to rowan (right) supporting a large patch of *Sticta fuliginosa* and *Biatora chrysantha* and *Sticta sylvatica* on hazel (left). NN 85210 47391. View direction SSE.*



Figure 74. SCM DMP 7. Rowan supporting healthy a frequent thalli of: Lobaria pulmonaria, Peltigera collina, Sticta fuliginosa (new site record) and S. sylvatica. Nephroma laevigatum was recorded on this tree in 2013 but was not re-found on this tree in 2017. NN 85220 47351. View direction from path ESE.



Figure 75. Lobaria pulmonaria on two fallen hazel stems at back of DMP 7. Sticta sylvatica was also found here on a fallen limb of DMP 7. View direction SE.



Figure 76. Hazel supporting Normandina pulchella, Peltigera collina, Sticta limbata and S. sylvatica. NN 85235 47396. View direction due west.

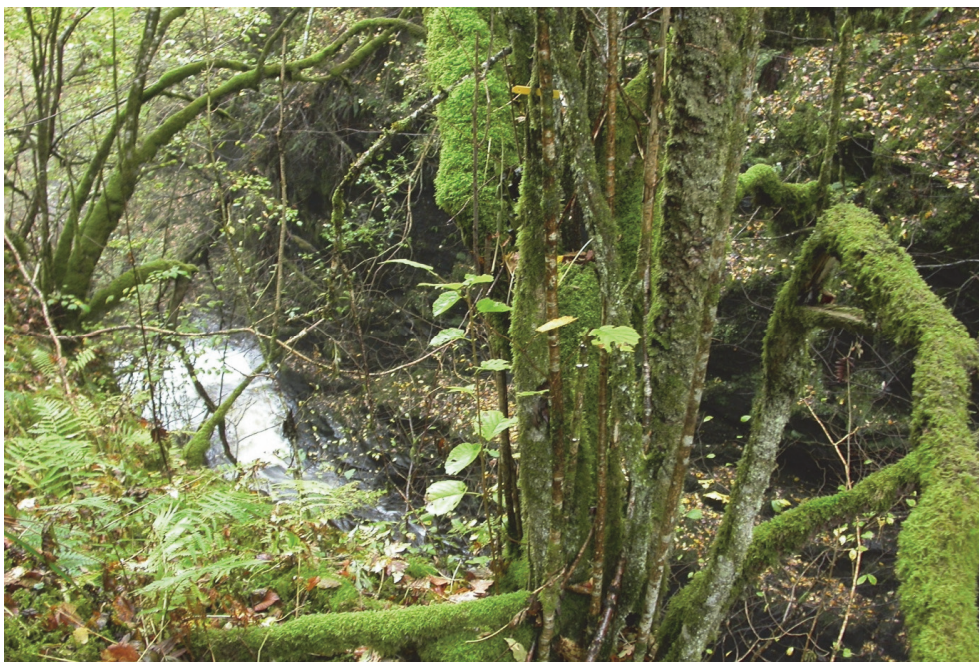


Figure 77. Hazel near bottom of ravine, supporting a small thallus of Lobaria pulmonaria measuring 5 x 3cm, below yellow tag, upper centre. NN 85242 47400. View direction N.



Figure 78. Position of Thelenella larbalestieri (VU, NR E Sc IR and new site record) behind mossy bluff, below under hang of cliff face at base of ravine. NN 85242 47366. View direction due south.

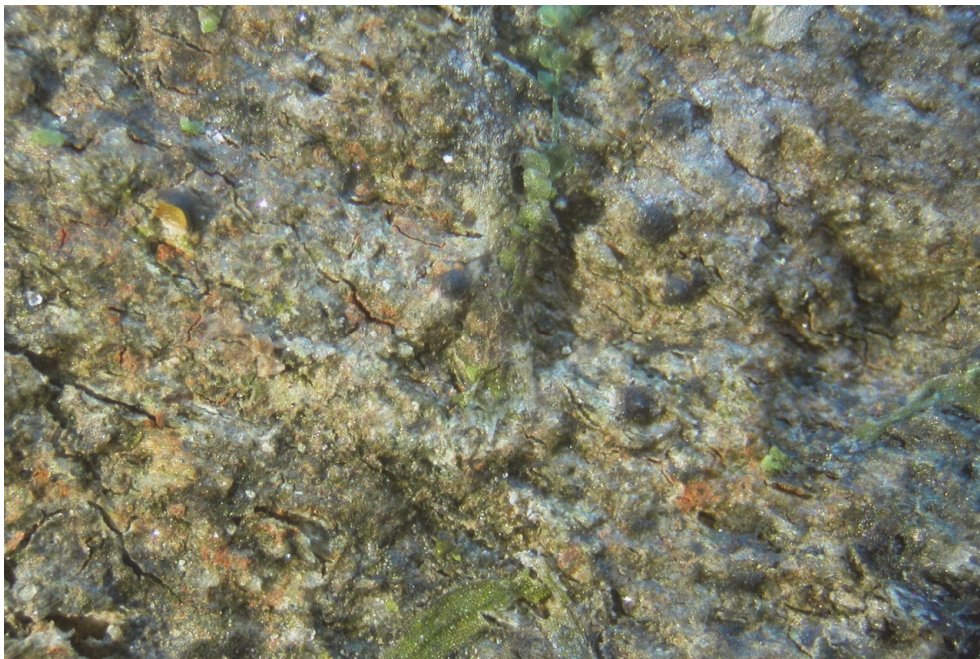
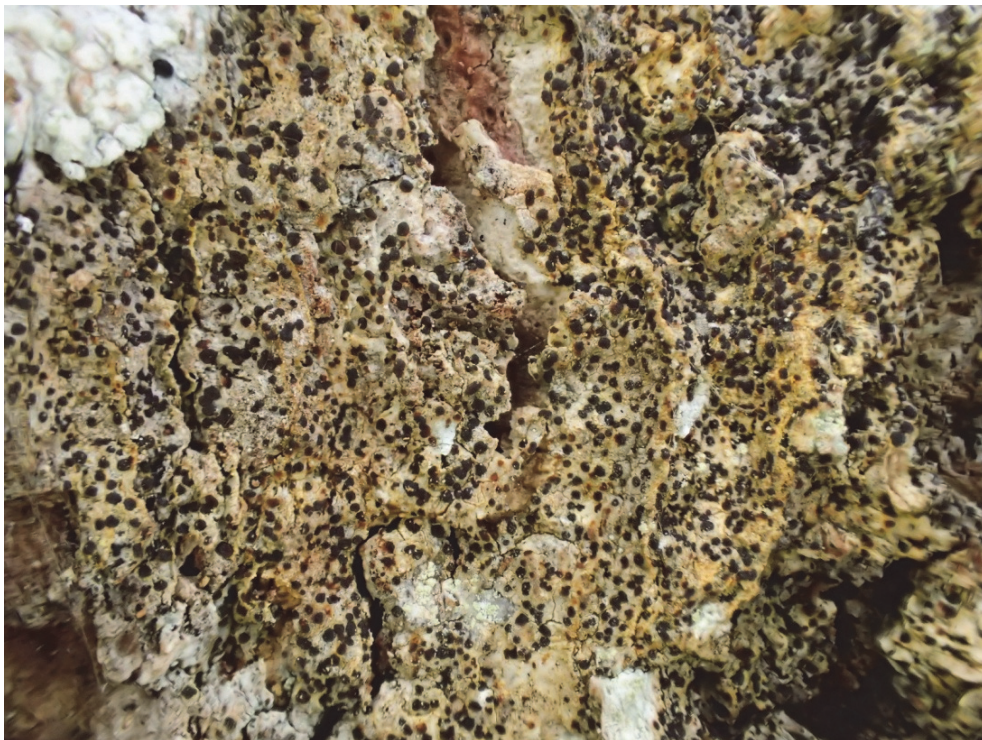


Figure 79. Thelenella larbalestieri found at Birks of Aberfeldy. One perithecium has been cut through (upper, left) showing the pale orange/yellow hymenial gel. This British endemic is classified as a Vulnerable, Nationally Rare, International Responsibility species and is a new record for the SSSI.

Compartment 10



*Figure 80. Plot 28 Oak inside compromised exclosure supporting *Arthonia vinosa* and *Megalaria pulverea*. Removal of beech regen. here is of medium priority as this section supports some lichens of conservation although they are relatively abundant at this site and not under immediate threat. NN 8537 4803. View direction SSW.*



*Figure 81. Plot 28. *Arthonia vinosa* on oak in picture above.*

Compartment 11



Figure 82. Showing frequent mature and sapling beech. This section is low priority for beech removal as few lichens of conservation interest were recorded here. Picture taken looking upstream, south from bridge. NN 8553 4838.

APPENDIX 2: TAXA RECORDED FOR BIRKS OF ABERFELDY FOR ALL RECORDING PERIODS

Species highlighted in blue = New site records.

e = in the Case of Caliciales (Pin Head lichens) 6 required to score one. In the Case of *Nephroma laevigatum* and *N. parile* one or both score one. In the Case of *Sticta fuliginosa* and *S. sylvatica* one or both score one.

Taxa	Status & rarity	E	1974 & 1986	2001	2012 & 2013	2017
<i>Acrocordia gemmata</i>			Ap,U	Ap		Fx
<i>Amandinea punctata</i>			U			
<i>Anisomeridium biforme</i>			U	Fx		Fx
<i>Anisomeridium polypori</i>			U	Fx		
<i>Arthonia didyma</i>			Co,Fx,Q,U	Co		Co, Fx, CTi
<i>Arthonia elegans</i>		E		Fx		
<i>Arthonia muscigena</i>	NS			E-by		
<i>Arthonia punctiformis</i>			Cort			Fg, Co, Bt
<i>Arthonia radiata</i>			Co	Co		Co, Sb, Fx
<i>Arthonia spadicea</i>			U			Bt
<i>Arthonia vinosa</i>		E	Q	Q	Q	Q, Bt
<i>Arthopyrenia analepta</i>			Cort			Bt
<i>Arthopyrenia carneobrunneola</i>	NS IR			Fx		Co
<i>Arthopyrenia punctiformis</i>						Co
<i>Arthopyrenia salicis</i>			Co	Co		
<i>Aspicilia caesiocinerea</i>						Sax
<i>Aspicilia laevata</i>	NS			Sax		
<i>Bacidia absistens</i>			U	Fx,Q		Sx
<i>Bacidia arceutina</i>			Fx			
<i>Bacidia beckhausii</i> (Micarea synotheoides)	NS	E	Q	Fx		
<i>Bacidia carneoglauca</i>	NS					Sax
<i>Bacidia circumspecta</i>	NS	VU	L B U			
	P					
<i>Bacidia delicata</i>				Co		
<i>Bacidia rubella</i>			U		CFx	
<i>Bacidia subincompta</i>	NS	VU	E Q		Fx	Fx,Q
	P					
<i>Bacidia sulphurella</i>	NS			Co		
<i>Bacidia viridifarinosa</i>			U	Sax		
<i>Bacidia</i> sp. [Coppins 11270]			Sax			
<i>Baeomyces rufus</i>			Sax/T			Sax
<i>Biatora chrysantha</i>	NS	E		Fx	Sx	CCo, CQ
<i>Biatoropsis usnearum</i> (Lic)				On	Usnea	On U. subflo
				subflo		on Fg
<i>Bilimbia sabuletorum</i>			Sax-con			
<i>Bryobilimbia ahlesii</i>	NS			Sax		Sax
<i>Bryoria fuscescens</i>			Cort	Bt,Sx		Bt, Q
<i>Bryoria subcana</i>		L			Lx	Bt
<i>Buellia disciformis</i>			Fg			
<i>Buellia griseovirens</i>						CBt
<i>Buellia schaereri</i>						Lx
<i>Candelariella reflexa</i>						Fx
<i>Calicium glaucellum</i>		e	Q			
<i>Calicium viride</i>		e	Q,L-st	Q		Bt
<i>Caloplaca cerinella</i>						Sm
<i>Caloplaca cerinelloides</i>						Sm
<i>Catinaria atropurpurea</i>		E	U		Q	
<i>Cetraria muricata</i>			L-st			
<i>Cetraria sepincola</i>			Bt-tw	Bt-tw		Bt-tw
<i>Chaenotheca brunneola</i>		e		Q		

Taxa	Status & rarity	E	1974 & 1986	2001	2012 & 2013	2017
<i>Chaenotheca chrysocephala</i>		e		Q		Bt
<i>Chaenotheca ferruginea</i>		e	L-st	L-st		Bt
<i>Chaenotheca furfuracea</i>		e	Sax/T			Bt, Q, Lx
<i>Chaenotheca trichialis</i>		e	L-st	Q,L-st	Q	Q, Bt
<i>Chaenothecopsis savonica</i>	NT,NR, Sc	e				Q
<i>Chrysothrix candelaris</i>			Cort	Q		Q, Bt
<i>Cladonia bellidiflora</i>						Bt, Sax
<i>Cladonia chlorophaea</i> agg.			L			
<i>Cladonia ciliata</i> var. <i>ciliata</i>			Sax			Terr+Lig
<i>Cladonia coccifera</i> agg.			Sax			
<i>Cladonia coniocraea</i>			Cort	Sx		Bt, Q
<i>Cladonia digitata</i>			L			Lig
<i>Cladonia macilenta</i>			L			Bt
<i>Cladonia polydactyla</i> var. <i>polydactyla</i>			L			Q
<i>Cladonia portentosa</i>			L			
<i>Cladonia pyxidata</i>				Fx,Q		Sax+BrySx
<i>Cladonia squamosa</i> var. <i>squamosa</i>			L	Q		Bt
<i>Cliostomum griffithii</i>			Cort	Q		
<i>Collema flaccidum</i>				Sax		
<i>Collema furfuraceum</i>		E				Fx
<i>Cyrtidula quercus</i>			Q-tw			
<i>Cystocoleus ebeneus</i>			Sax	Sax		Sax
<i>Degelia plumbea</i> s. str.	IR	E	Q	Fx	Fx	Fx
<i>Dimerella pineti</i>			U			
<i>Endococcus bryochysporus</i>	NE NR					Lic
<i>Evernia prunastri</i>			Cort	Q		Q, Bt Fx, Fg, Lx
<i>Fellhaneropsis vezdae</i>			U	Fx		
<i>Fuscopannaria mediterranea</i>	NS	E	Q		Q	
<i>Graphis elegans</i>						CSb
<i>Graphis scripta</i>			C	Co		Co, Fx Bt Sx
<i>Gyalecta jenensis</i>			Sax-con			
<i>Haematomma ochroleucum</i> var. <i>porphyrium</i>				Sax		Sax
<i>Hypocenomyce friesii</i>	NS	L	L-st			
<i>Hypocenomyce scalaris</i>						Lx
<i>Hypogymnia physodes</i>			Cort	Bt		Bt, Lx,Al, Fx
<i>Hypogymnia tubulosa</i>			Cort	Sb		Fg
<i>Hymenelia lacustris</i>						Sax
<i>Lecanactis abietina</i>			Cort	Q		Bt,Q,Fg
<i>Lecania cyrtellina</i>			U			
<i>Lecanora carpineae</i>			Cort			Fx
<i>Lecanora chlarotera</i>			Cort	Co,Ppt		Q,Fx
<i>Lecanora expallens</i>			Cort	Q		Fg
<i>Lecanora intricata</i>			Sax			
<i>Lecanora intumescens</i>						Fx
<i>Lecanora muralis</i>			Sax			
<i>Lecanora pulicaris</i>			Bt	Bt		Bt
<i>Lecidella elaeochroma</i>			Cort			Fx,Co,Fg
<i>Lepraria finkii</i> (syn. <i>lobificans</i>)				Co,Fx,Sx		Fg,Fx,Ap,U, Bt,Q,Sb,Lx, Sax+Bry

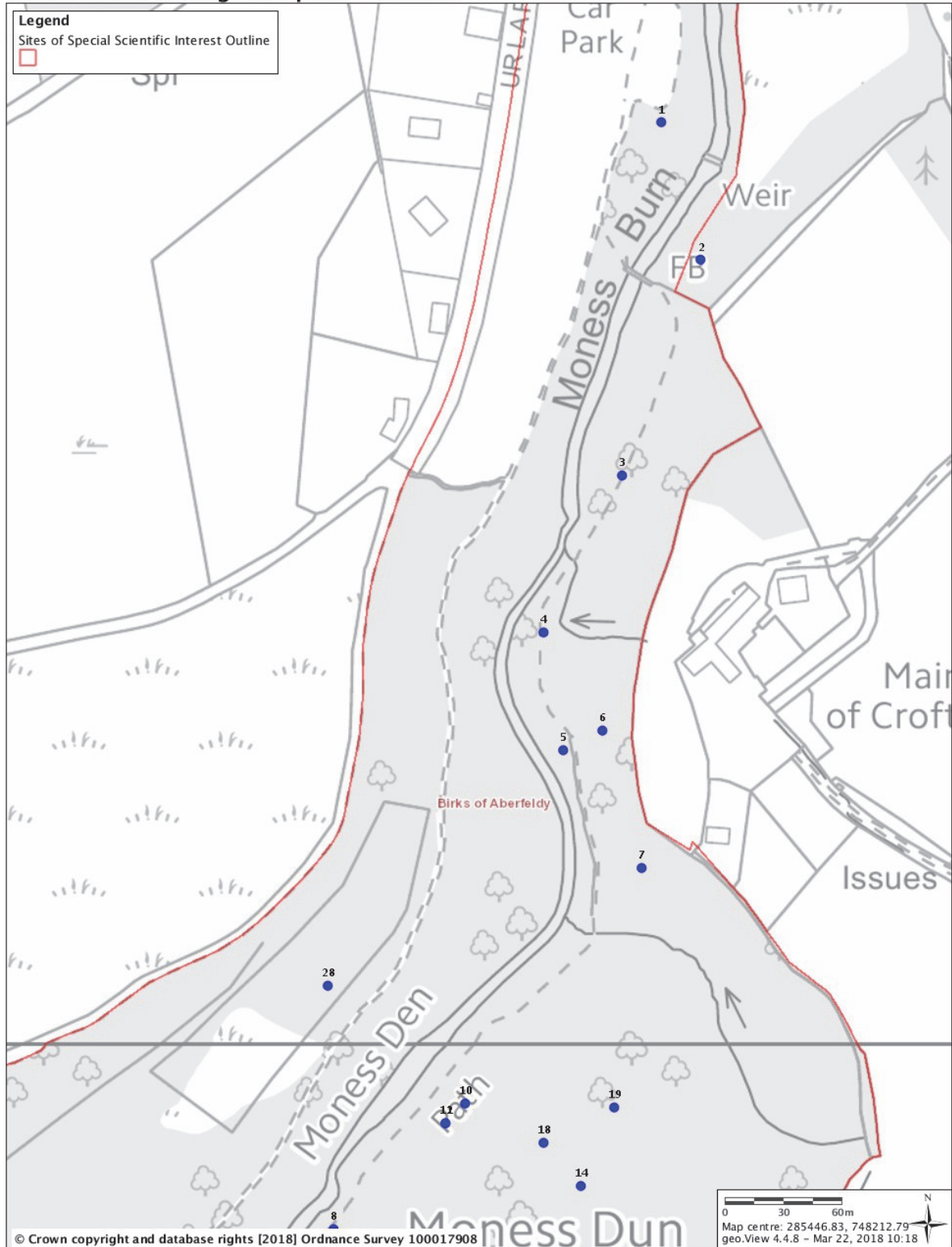
Taxa	Status & rarity	E	1974 & 1986	2001	2012 & 2013	2017
<i>Lepraria incana</i> s. str.			Cort,Sax	Q		Q,Fx,Sax, Lx, Fg
<i>Lepraria jackii</i>				Q		
<i>Lepraria rigidula</i>				S		Bt
<i>Leptogium lichenoides</i>			Fx,Sax-con	Q,Sax	Fx	Sax+Bry Fx,Sx, Sb,Co
<i>Leptorhaphis epidermidis</i>			Bt			
<i>Lichenomphalia ericetorum</i>			L			Lig
<i>Lichenomphalia hudsoniana</i>			L-st			
<i>Lobaria pulmonaria</i>	IR	E		Sb	Sb	Co,Fx
<i>Lobaria scrobiculata</i>	IR	E	Q			Q,Sx
<i>Lopadium disciforme</i>		E	Q	Q,Sx	Q,Sx	Bt,Sx, Q
<i>Loxospora elatina</i>		E	Fg,Q		Ap	Bt
<i>Megalaria grossa</i>		E	Cort			Fx
<i>Megalaria pulverea</i>		E		Sx	Sx	Sx
<i>Melanelixia fuliginosa</i>			Sax			
<i>Melanelixia glabratula</i>			Cort	Co		
<i>Melanelixia subaurifera</i>			Cort	Sb		
<i>Melanohalea exasperata</i>						CFg
<i>Melanohalea laciniatula</i>						CFg
<i>Micarea adnata</i>	NS	L		L-st		
<i>Micarea bauschiana</i>			Sax			
<i>Micarea lutulata</i>			Sax			
<i>Micarea melaena</i>			L	L-st		
<i>Micarea prasina</i> s. lat.			Co	Q		
<i>Mycobilimbia epixanthoides</i>		E		Fx	Fx	Fg,Fx
<i>Mycobilimbia pilularis</i>		E	U	Fx,Sax	Fx	
<i>Nephroma laevigatum</i>	IR	e	Cort		Fx,Sb,Sx	Fx,Sx
<i>Nephroma parile</i>		E	Cort	Sx	Sx	Sx
<i>Nephroma resupinatum</i>	Ex				Sx	Sx
<i>Normandina acroglypta</i>				Ppt		
<i>Normandina pulchella</i>		E		Fx	Fx	
<i>Ochrolechia androgyna</i>			Q	Q,Sx		Q
<i>Ochrolechia microstictoides</i>			Q	Bt		
<i>Ochrolechia parella</i>				Sax		Sax
<i>Opegrapha gyrocarpa</i>			Sax	Sax		Sax
<i>Opegrapha herbarum</i>				Fx	Fx	
<i>Opegrapha ochrocheila</i>			Co			
<i>Opegrapha rufescens</i>			U			Fx
<i>Opegrapha sorediifera</i>			U			Fx,Sx
<i>Opegrapha thelotrematis</i> (Lic)	NS, IR					On <i>T.lepadinum</i> on Fg Sm, Fg
<i>Opegrapha varia</i>			Ap,U			
<i>Opegrapha vermicellifera</i>			U	Ap		
<i>Opegrapha vulgata</i>			E			Co,Fx,Q
<i>Pannaria conoplea</i>	IR	E	Q			Fx?
<i>Parmelia saxatilis</i>			Fg, Cort	Fx		Sax, Bt, Fg, Fx
<i>Parmelia sulcata</i>			Cort	Sx		Bt,Lx,FxFg
<i>Parmeliella parvula</i>						Sx
<i>Parmeliella triptophylla</i>	IR	E	Q	Fx	Fx	Fx
<i>Parmeliopsis ambigua</i>			Cort			
<i>Parmeliopsis hyperopta</i>				L-st		
<i>Peltigera collina</i>	IR	E	Co,U	Co,Fx	Fx,SbSx	Sx,Fx,Co,Sb
<i>Peltigera degenii</i>	NS	L	Sx			
<i>Peltigera didactyla</i>			T-car park			

Taxa	Status & rarity	E	1974 & 1986	2001	2012 & 2013	2017
<i>Peltigera horizontalis</i>		L	Cort	Sx	?	L, Sax+Bry, Sx
<i>Peltigera hymenina</i>						Fg, Fx, Sx
<i>Peltigera membranacea</i>			Sx		Sx	Cort+Sax+Br y
<i>Peltigera praetextata</i>			Fx, Sx	Co, Fx, Q, Sax	Fx, Sx	U, Fx, Sx
<i>Pertusaria albescens</i> var. <i>albescens</i>			Q	Fx, Q		Q, Ti, Sx
<i>Pertusaria albescens</i> var. <i>corallina</i>				Fx		
<i>Pertusaria amara</i>			Cort	Co		Fx, Bt, Q, Ap
<i>Pertusaria coccodes</i>				Q		
<i>Pertusaria hymenea</i>			Fx	Q		Fg, Fx, Q
<i>Pertusaria leioplaca</i>			Co	Co		Ti, Co, FxPr, Q, Al
<i>Pertusaria pertusa</i>			Cort	Fx		Fg, Fx, Sx, Q, Co
<i>Pertusaria pupillaris</i>			Fg	Bt		
<i>Phaeophyscia endophoenicea</i>	NS			Co		
<i>Phlyctis argena</i>			Cort	Co, Fx		
<i>Physcia adscendens</i>						Sm
<i>Physcia aipolia</i>			Co			
<i>Physcia tenella</i>						Sm
<i>Placynthiella icmalea</i>				Q, L-fp		
<i>Platismatia glauca</i>			Cort	Q, Sx		
<i>Porina aenea</i>			Co	Co		
<i>Porina chlorotica</i>			Sax	Sax		Sax
<i>Porina lectissima</i>				Sax		Sax
<i>Porpidia rugosa</i>						Sax
<i>Porpidia tuberculosa</i>			Sax	Sax		
<i>Pronectria pertusariae</i> (Lic)			on <i>P. pertusa</i> on Fx			
<i>Protopannaria pezizoides</i>		L	L		Sx	Sx
<i>Pseudevernia furfuracea</i> var. <i>ceratea</i>				Sx		
<i>Psilolechia lucida</i>			Sax	Sax		
<i>Ptychographa xylographoides</i>	NS IR	NT L		L-conifer-st		
<i>Pyrenula occidentalis</i>	IR	L	Co, Fx	Co, Fx, Sb	Fx	Fx
<i>Racodium rupestre</i>			Sax			Sax
<i>Ramalina farinacea</i>			Cort	Q		Fx, Sm
<i>Rhizocarpon geographicum</i>			Sax	Sax		Sax
<i>Rhizocarpon lavatum</i>				Sax		Sax
<i>Sagediopsis lomnitzensis</i> (Lic)	LC NR					On <i>l. lacustris</i>
<i>Scoliciosporum chlorococcum</i>			Lx-tw			
<i>Schismatomma umbrinum</i>	LC Sc	NS IR				Sax
<i>Sphaerophorus globosus</i>						Bt
<i>Stenocybe pullatula</i>		e				CAI
<i>Sticta fuliginosa</i>		e				Sb
<i>Sticta limbata</i>		E			Fx	Q, Co, Fx, Sx
<i>Sticta sylvatica</i>	IR	e	Q	Co	Sb, Sx	Sx, Sb, Co, Q
<i>Stigmindium micropillum</i>						On <i>G. scripta</i> on rowan
<i>Thelenella larbalestieri</i>	VU NR	D2 E Sc IR				Sax

Taxa	Status & rarity	E	1974 & 1986	2001	2012 & 2013	2017
<i>Thelotrema lepadinum</i>		E	Co,Q	Sx	Fx,Q, Sx	Fx,Q, Sx
<i>Trapelia corticola</i>				Q		Q
<i>Trapelia placodioides</i>						Sax
<i>Trapeliopsis flexuosa</i>			L-st	L-fp		
<i>Trapeliopsis pseudogranulosa</i>			L-st	Bt		
<i>Tremella coppinsii</i> (Lic)	NS			on <i>Violella fucata</i>		On <i>P. glauca</i> on birch
<i>Tuckermannopsis chlorophylla</i>			Cort	L-fp		
<i>Unguiculariopsis lettau</i> (Lic)	NS					On <i>E. prunastri.</i> on Fg
<i>Usnea filipendula</i>				Bt		
<i>Usnea hirta</i>			Bt	Bt		
<i>Usnea subfloridana</i>			Cort	Bt,Q,Sx		
<i>Usnea wasmuthii</i>				Sx	Q	
<i>Varicellaria</i> (syn. <i>Pertusaria</i>) <i>hemisphaerica</i>		E	Q	Q		Q
<i>Verrucaria hydrela</i>			Sax			
<i>Verrucaria hydrophila</i>						
<i>Verrucaria margacea</i>						Sax
<i>Verrucaria dolosa</i>						Sax
<i>Verrucaria elaeina</i>						Sax
<i>Verrucaria rosula</i>	LC ?NR					Sax
<i>Violella fucata</i>				Bt		
<i>Vouauxiella lichenicola</i> (Lic)						On <i>L. chlarotera</i>
<i>Xanthoria candelaria</i> s. lat.			Q			

APPENDIX 3: DETAILED MAPS SHOWING LOCATION OF PLOTS

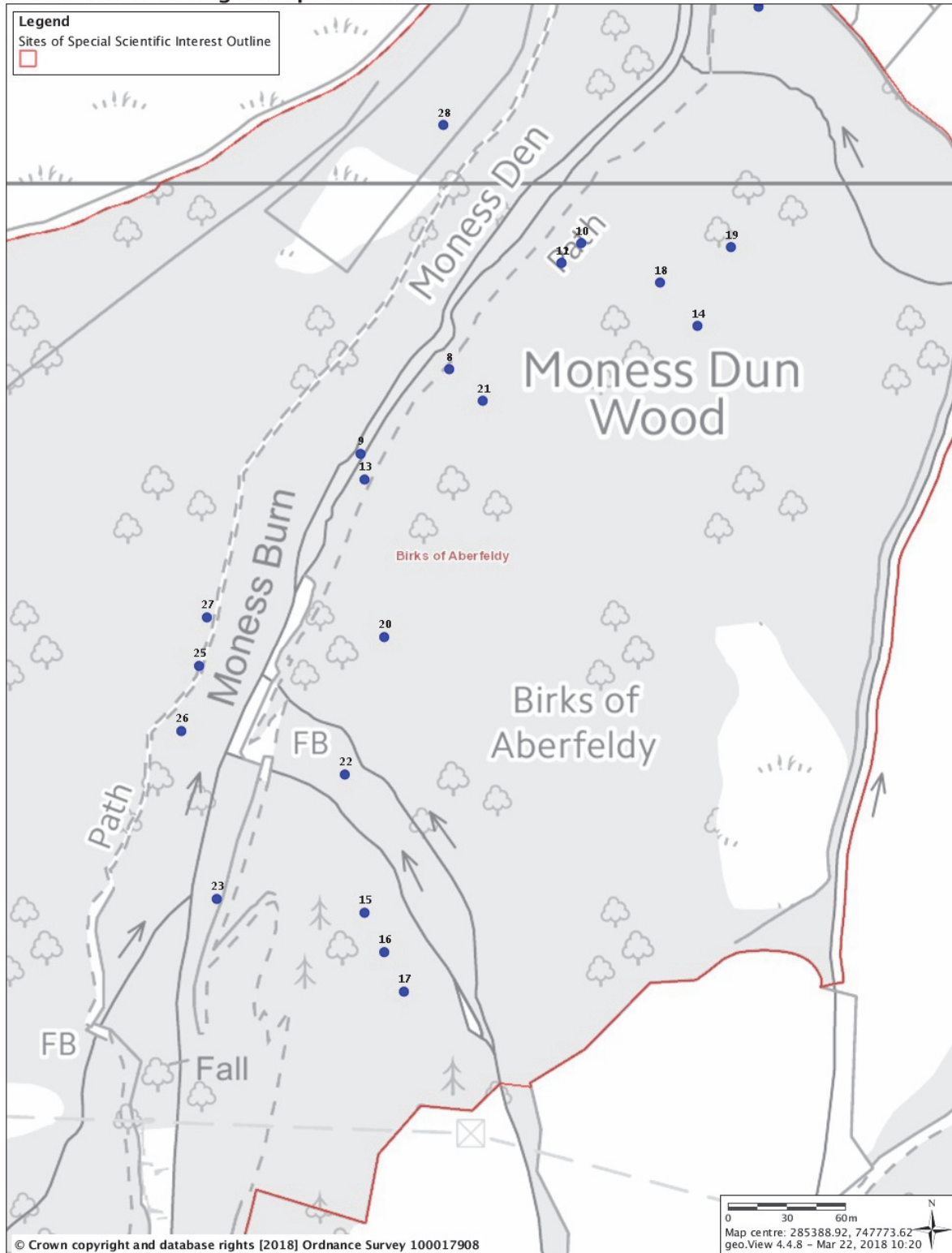
Lichen beech management plots - NORTH



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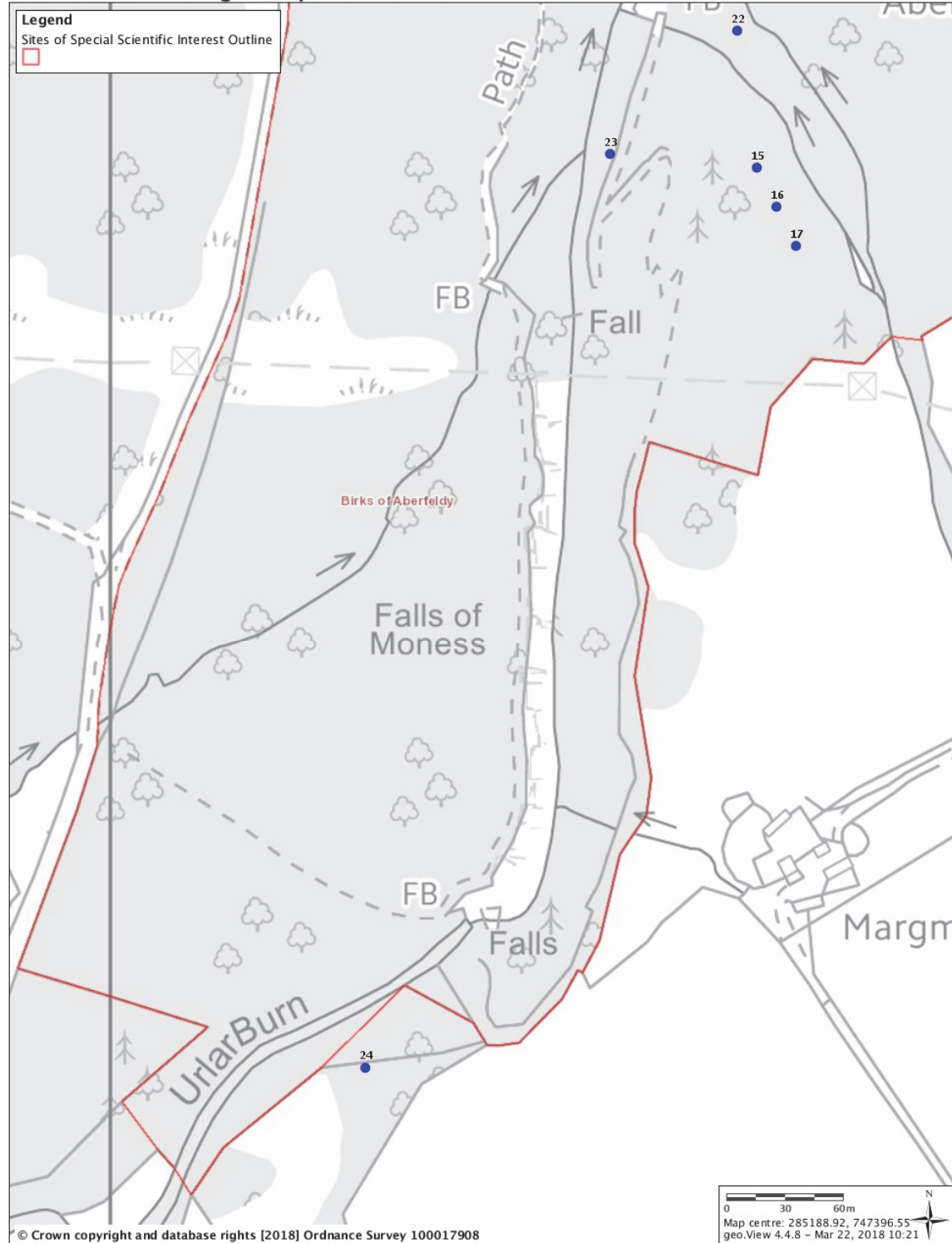
Lichen beech management plots - CENTRE



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Lichen beech management plots - SOUTH



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