

RESTORING ACTIVE BLANKET BOG IN IRELAND

Project reference: LIFE02NAT/IRL/8490

A REPORT ON THE RESTORATION OF PROJECT SITE No. 3.
DRUMALONHURT, CO. KERRY



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Project Site No. 3 – Dromalohurt, Co. Kerry (Demonstration Site)

1. Introduction

Grid reference V 695 810	Elevation (m) 150 to 172	Bedrock geology Old red sandstone
SAC Name and number Killarney National Park/ Magillicuddy's Reeks/Caragh river (365)	Site area (ha) 102.0	Main restoration methods Fell to waste of conifer crop by machine and drain-blocking with plastic dams
Area of conifer cover (ha) 28.3	Area of open bog/heath (ha) 73.9	
Noteworthy plant/animal species occurring <i>Sphagnum pulchrum</i> , <i>Rhynchospora fusca</i> , <i>Geomalacus maculosus</i> (Kerry spotted slug), <i>Margaratifera margaratifera</i> recorded from adjoining river.		

Dromalohurt lies within the Killarney National Park, MacGillycuddys' Reeks and Caragh River Catchment Special Area of Conservation and is situated some 15 kilometres southwest of Killorglin, Co. Kerry. The site adjoins a small tributary of the Caragh River, a well-studied river catchment which is considered to be acid-sensitive and contains a population of the rare Annex II mollusc *Margaratifera margaratifera*.

This project site consists of 102 hectares 28.9 hectares of which are planted with conifers with the remainder comprising high quality, lowland blanket bog habitat. The site itself occurs within a larger area (c. 220 hectares) of blanket bog that was surveyed by the Wildlife Service in 1989 as Ballygisheen, which received a high rating for its ecological value (Douglas *et al.*, 1989). The vegetation of the unplanted blanket bog area is typically dominated by purple moor-grass (*Molinia caerulea*), black bog-rush (*Schoenus nigricans*) and a range of typical species of sedges and mosses. Cover of *Sphagnum* cover is generally high and includes the nationally rare *Sphagnum pulchrum*. An area of quaking peat with extensive pool systems occurs within the site and these pools support brown-beaked sedge (*Rhynchospora fusca*) which is a rare species, especially in the southwest of the country. The planted area of this site is dominated by Sitka spruce of variable quality and the presence of bog vegetation under these trees varies with canopy cover.

At this site the main restoration measure undertaken was the felling of the young/low-yielding conifer crop by machine and the blocking of any significant artificial drains with plastic piling dams. During tree felling the machine pulled much of the felled material into brush tracks which it travelled on thus creating substantial open bog surface between the brush tracks.

2. Methods

Prior to the start of restoration activities at the site the habitats and vegetation occurring were surveyed and described. Habitats occurring were mapped with the aid of a vertical aerial photograph

of the site taken in the year 2000 by the Ordnance Survey of Ireland. At the end of the project the habitats present were mapped with the aid of a vertical aerial photograph of the site taken between 2004 and 2006.

The vegetation occurring at the site was described using the Zurich-Montpellier approach (Mueller-Dombois and Ellenberg, 1979), where the percentage cover of the various vegetation layers and plant species in a defined area is estimated visually. The cover of plant species in relevés was estimated in accordance with the Domin scale which is outlined in the table below.

Table 1. The Domin scale of cover/abundance.

1 = <4% cover with few individuals
2 = <4% cover with several individuals
3 = <4% cover with many individuals
4 = Cover between 4 and 10%
5 = Cover between 11 and 25%
6 = Cover between 26 and 33%
7 = Cover between 34 and 50%
8 = Cover between 51 and 75%
9 = Cover between 76 and 90%
10 = Cover between 91 and 100%

In addition to plant species presence and cover, the following parameters were noted for each relevé:

- (1) Size
- (2) Percentage cover of vegetation, bare soil, water and rock.
- (3) Percentage cover and height of the different vegetation layers, e.g. shrub, dwarf shrub, herb and bryophyte.
- (4) Soil type and depth.
- (5) Slope and aspect.
- (6) Additional details, such as the composition of the surrounding vegetation, degree of grazing and disturbance.

During the initial fieldwork a number of colour photographs of the site and vegetation encountered were taken with a digital camera and a selection of these are presented in this report in order to illustrate the vegetation descriptions and changes in the habitats/vegetation present over time. Mosses, liverworts and higher plants not readily identified in the field were collected and keyed out at a later date using keys in the appropriate publications (see below). During the field survey, particular attention was paid to the possible occurrence of plant and animal species which are considered to be rare in both a national and local context with particular emphasis on animal species listed in Annex II of the E.U. Habitats Directive and plant species listed in the Irish Red Data Book for vascular plants (Curtis and McGough, 1988), the 1999 Flora Protection Order and Annex II of the E.U. Habitats Directive.

Plant species nomenclature in this report follows Stace (1997) for vascular plant, Smith (2004) for mosses, Smith (1991) for liverworts and Dahl (1968) for lichens.

3. Site Photographs

In order to show the restoration activities which have taken place at this site a number of photographs are presented in the following pages. These include both aerial photographs, supplied by the Ordnance Survey of Ireland, and a selection of ground photographs taken by the author.



A long distance view of the site taken from high ground to the south-west. Note the pool systems on the right of the photograph. Photograph taken in March 2003.



A view along the western margin of the forestry area. Photograph taken in March 2003.



The same view taken in August 2004 with the conifer crop felled.



A view of felled trees in the north of the site, looking in a southerly direction. Note the moss covered bog surface between the brush tracks. Photograph taken in September 2003.



The same view taken in August 2006. Note the substantial "greening up" of the site due to the growth of *Molinia caerulea*.



Regeneration of birch saplings is occurring over c. 2 hectares of ground at the northern end of the site. This is due to the relatively shallow peat depth in this area.



The Annex II animal species Kerry spotted slug was noted in recently clearfelled areas of the site.



An aerial photograph of the Drumalohurt site (afforested portion only) prior to restoration work taking place.
Aerial photograph taken in the year 2000.



An aerial photograph of the Drumalohurt site after restoration. Aerial photograph taken in the year 2006.

4. Vegetation of the site

The afforested section of this site was dominated by a linear area of coniferous plantation which was established in the early 1980's. The main species planted was Sitka spruce with small amounts of lodgepole pine occurring, intermingled with the spruce. The growth of the conifer crop was quite patchy and the yield class was generally poor with trees mostly between 4 and 7 metres tall. The ground vegetation of the afforested areas tended to be dominated by needle litter and mosses with the moss *Hypnum cupressiforme* by far the most abundant species.

The intact blanket bog area within the site shows a good range of blanket bog morphological features ranging from blanket bog pools to areas of deep, quaking bog and drier, heathy areas where the peat depth is relatively shallow. The following table shows the variation in vegetation cover that occurs. Pools tend to be dominated by the aquatic mosses *Sphagnum auriculatum* and *S. cuspidatum* with *Menyanthes trifoliata* the main vascular plant species. Undisturbed blanket bog is dominated by *Molinia caerulea*, *Schoenus nigricans*, *Erica tetralix*, *Calluna vulgaris* and *Rhynchospora alba* with *Racomitrium lanuginosum* and *Sphagnum capillifolium* the main moss species. Adjacent to the forestry, where the effects of drainage are evident the bog vegetation is dominated by lush *Molinia caerulea* with the moss *Hypnum cupressiforme* also frequent.

Table 1. Blanket bog vegetation at Drumalohurt.

	A	A	A	A	B	B	B	B	B	B	C	C	C	C
adrat code	D5	D6	D9	D8	D1	D4	D12	D7	D11	D10	D2	D3	D13	D14
S Grid letter	V	V	V	V	V	V	V	V	V	V	V	V	V	V
S easting co- inate	6964	6961	6941	6942	6958	6965	6968	6945	6959	6941	6984	6968	6982	6993
S northing co- inate	8129	8127	8108	8113	8145	8131	8069	8121	8060	8094	8139	8132	8075	8076
adrat size (m ²)	2	2	2	3	4	4	4	4	4	4	4	4	4	4
pe (degrees)	0	0	0	0	0-5	0-3	0	0	0	0-5	0-3	0	0	0
etation cover	65	80	70	60	99	100	85	95	95	99	90	95	100	95
e rock (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
e soil (%)	10	0	15	0	1	0	15	10	5	1	10	5	0	5
en water (%)	15	50	30	70	0	0	0	0	0	0	0	0	0	0
arf shrub cover	0	0	0	0	40	50	40	40	45	20	10	5	90	0
b cover (%)	15	20	40	50	70	65	75	75	60	80	80	35	20	90
ophyte cover (%)	65	60	65	15	70	75	50	40	55	50	25	90	45	50
of vegetation	10	10	15	15	20	15	10	15	15	25	40	20	25	40
of species	7	8	8	9	18	23	19	21	13	13	18	13	14	5
<i>nyanthes trifoliata</i>	4	4	3	3				1						
<i>ragnum auriculatum</i>	4	8	8	5				4			4			
<i>ex limosa</i>	4	4	5											
<i>sera intermedia</i>	1	3		4				1	3					
<i>oenus nigricans</i>				5	5	4	4	4	5					
<i>comitrium lanuginosum</i>					5	4	7	5	7	7			4	
<i>urozia purpurea</i>					3	3	3	1	1	5				
<i>sera rotundifolia</i>					1	3	1	1						
<i>ragnum villosum</i>					4	5		4		1				
<i>donia portentosa</i>					4	3	3	1		1				
<i>pylopus virens</i>							4	5	4	4	1			
<i>donia uncialis</i>						1	1	1	1					
<i>licularis sylvatica</i>						1	1							
<i>linia caerulea</i>	3		3	5	7	7	6	5	7	8	8	6	9	9
<i>phorum justifolium</i>	1	3	5	4	3	4	4	1	4	4	3		4	
<i>a tetralix</i>					6	6	6	5	7	5	4	3	4	
<i>luna vulgaris</i>					5	5	5	5	4	4	4	3	5	
<i>ynchospora alba</i>		1	4	6	3	1	7	8	4	4				
<i>thecium</i>		1	1		3	4	3	4	3	1				
<i>ifragum</i>														

<i>ragnum</i>	4		5	8	3	5				8	3
<i>villifolium</i>											
<i>ragnum tenellum</i>			4	4	4	4	4	3	1		1
<i>ontoschisma</i>		1	3	3					1		1
<i>agni</i>											
<i>isera anglica</i>		3	1		3	1					
<i>num</i>									3	5	4
<i>ressiforme</i>											7
<i>ragnum</i>	8			3		1					
<i>pidatum</i>											
<i>entilla erecta</i>				3					3	3	
<i>ygala serpyllifolia</i>			1				1	1			
<i>icobryum</i>			1								1
<i>ucum</i>											
<i>hophorum</i>			4	5							3
<i>pitosum</i>											
<i>erwort species</i>									1	3	4
<i>ostis canina</i>									1	3	
<i>ophorum</i>								3	3		4
<i>tinatum</i>											
<i>utelia</i>				1						4	
<i>ysocoma</i>											
<i>rtidiadelphus</i>										4	1
<i>rus</i>											
<i>icus bulbosus</i>									5		
<i>ytrichum</i>									4		
<i>nmune</i>											
<i>ragnum</i>									4		
<i>nitens</i>											
<i>mpylopus</i>									3		
<i>oflexus</i>											
<i>chnum spicant</i>									1		
<i>ragnum palustre</i>										4	
<i>ocomium</i>										3	
<i>endens</i>											
<i>munda regalis</i>										1	
<i>rex panicea</i>				3							
<i>guicula vulgaris</i>				1							
<i>ocomium</i>											1
<i>ustris</i>											
<i>idium</i>											3
<i>ariscinum</i>											
<i>rtidiadelphus</i>											1
<i>iarrosus</i>											

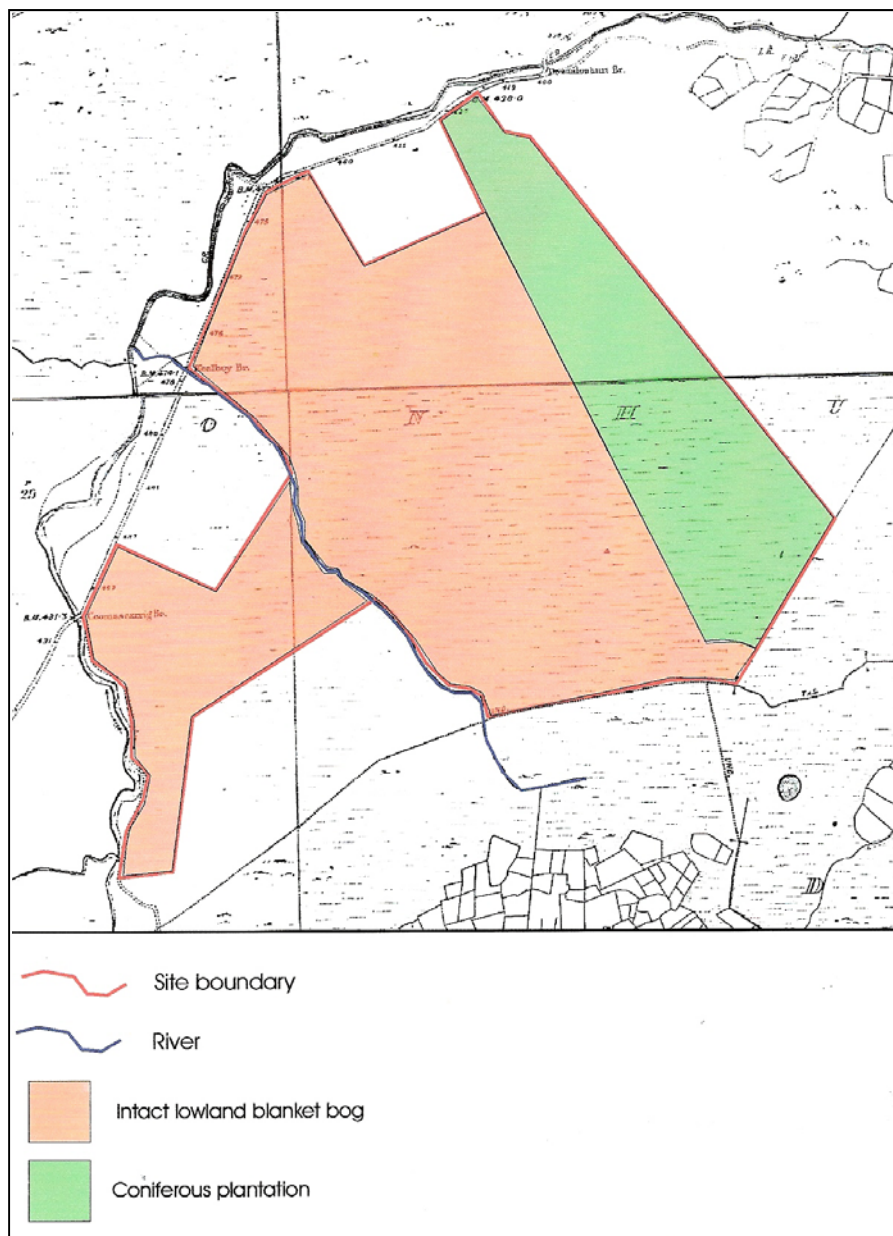
A = Blanket bog pools

B = Intact blanket bog

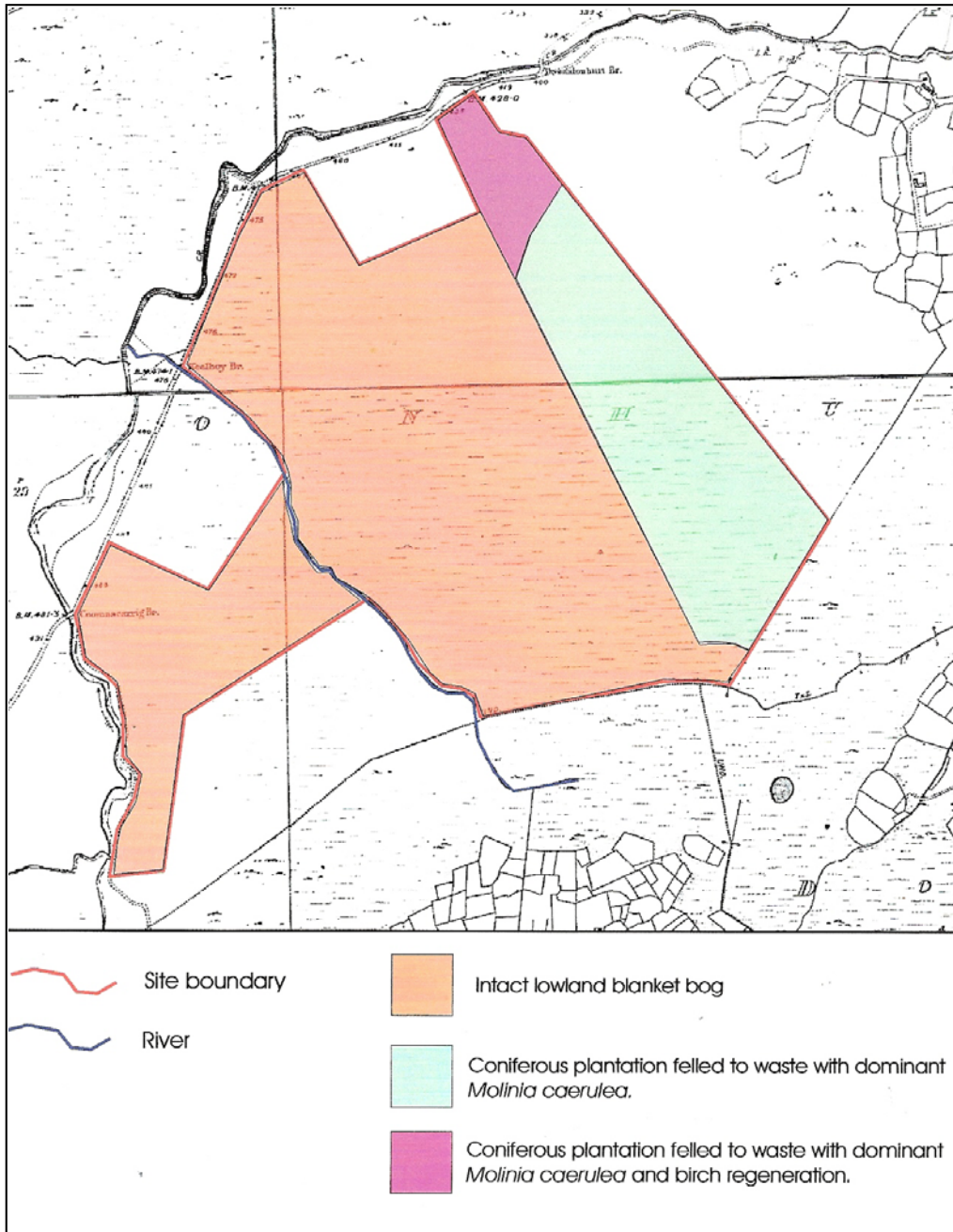
C = Heathy *Molinia/Hypnum* blanket bog influence by drainage

5. Changes in overall vegetation/habitat cover

At this site the main vegetation changes have occurred in the area of the site that was previously afforested with conifers. This part of the site is now dominated by a regenerating blanket bog/heath vegetation in which *Molinia caerulea* is the dominant species with the moss *Hypnum cupressiforme* also locally abundant. The remains of the felled conifer crop are still quite evident throughout this portion of the site and it will be interesting to see how long it will take this woody material to break down completely. At the northern end of the previously afforested area there is locally profuse regeneration of downy birch (*Betula pubescens*) saplings and this is mainly due to the shallow nature of the peat soil in this area.



A map of habitat/vegetation cover at Drumalohurt prior to the start of restoration



A map of habitat/vegetation cover at Drumalohurt at the end of the restoration project.

6. Monitoring quadrats

In the following pages the vegetation changes which have taken place within the site over the period of the restoration project are shown by means of observed changes in permanent quadrats. A total of 5 permanent quadrats were described and photographed at this site. In order to ensure the future relocation of quadrats the corners have been marked with short sticks and a 10-figure GPS reading was also recorded. In the case of each quadrat photographs and vegetation tables are presented in the following pages. The cover of plant species within the quadrats is presented in accordance with the scale outlined in the following table.

Cover of species in quadrat	Cover in presented quadrat tables
<1%	1
1 to 5%	2
5 to 10%	3
10 to 25%	4
25% to 50%	5
50 to 75%	6
75% to 100%	7

In common with most sites in this restoration project the main species to recolonize rapidly following tree felling is the grass *Molinia caerulea*. In many parts of the site this species has achieved a cover of >75% within three years. Even in areas where there is a substantial cover of felled conifers present on the bog surface, vigorous tussocks of *Molinia* can be seen growing up through the dead tree branches. At present the other prominent species in the permanent quadrats tend to be the mosses *Hypnum cupressiforme*, *Sphagnum capillifolium* while *Campylopus* sp. and *Polytrichum commune* also have a high cover locally.

The other noteworthy feature of this site, in terms of vegetation recovery, is the natural regeneration of *Betula pubescens* evident in the felled areas close to the road which runs along the northern margins of the site. Regeneration of the species in this area has been profuse and this is due to the shallow and well-drained nature of the peat soil. Although up until now this natural regeneration has been controlled by cutting and pulling of saplings the possibility of allowing the development of a small area of birch scrub (c. 2 ha), close to the road and parking area should be considered.



Permanent quadrat 1 – October 2003



Permanent quadrat 1 – August 2006

Code - PQ1			
GPS - V 69674 81531			
Near Walrag? - c. 5 m west of W. 5			
Size (m) - 6 x 6			
Slope (Degrees) - 3			
Vegetation cover (%)	98	98	100
Dwarf shrub cover (%)	<1	<1	2
Herb cover (%)	15	35	85
Bryophyte cover (%)	95	90	90
Needle litter cover (%)	5	<2	0
Brash cover (%)	5	3	0
No of species present	23	27	23
Date of survey	10/10/03	29/8/04	22/8/06
<i>Hypnum cupressiforme</i>	6	6	5
<i>Sphagnum capillifolium</i>	4	4	4
<i>Molinia caerulea</i>	4	5	7
<i>Sphagnum palustre</i>	4	4	3
<i>Rhytidiadelphus squarrosus</i>	3	-	-
<i>Thuidium tamariscinum</i>	3	3	3
<i>Rhytidiadelphus loreus</i>	3	3	3
<i>Hylocomium splendens</i>	2	3	3
<i>Plagiothecium undulatum</i>	2	-	-
<i>Sphagnum papillosum</i>	2	2	3
<i>Eurhynchium praelongum</i>	2	-	-
<i>Potentilla erecta</i>	2	1	1
Liverwort species	1	-	-
<i>Dicranum scoparium</i>	1	1	-
<i>Pseudoscleropodium purum</i>	1	2	1
<i>Dryopteris dilatata</i>	1	1	1
<i>Salix cinerea</i>	1	1	1
<i>Hedera helix</i>	1	1	1
<i>Erica tetralix</i>	1	1	1
<i>Ilex aquifolium</i>	1	-	1
<i>Blechnum spicant</i>	1	1	-
<i>Sorbus aucuparia</i>	1	1	-
<i>Dryopteris</i> sp.	1	1	-
<i>Polytrichum</i> sp.		2	3
<i>Pluerozium schreberi</i>		2	-
<i>Sphagnum auriculatum</i>		2	-
<i>Agrostis</i> sp.		1	1
<i>Luzula multiflora</i>		1	2
<i>Rubus fruticosus</i>		1	1
<i>Osmunda regalis</i>		1	1
<i>Betula pubescens</i> (seedlings)		1	-
<i>Pinus contorta</i> (seedling)		1	-
<i>Calluna vulgaris</i>			2
<i>Eriophorum vaginatum</i>			1
<i>Eriophorum angustifolium</i>			1
History – Previously dominated by a mixed Sitka spruce/Lodgepole pine plantation planted in the early 1980's. Trees were generally between 6 and 8 metres tall. Ground vegetation dominated by mosses (mainly <i>Hypnum cupressiforme</i>). Trees felled in the summer of 2003.			



Permanent quadrat 2 – October 2003



Permanent quadrat 2 – August 2006

Site - Drumalohurt			
Code - PQ2			
GPS - V 69708 81461			
Near Walrag? - No			
Size (m) - 5 x 5			
Slope (Degrees) – 20 to 30			
Vegetation cover (%)	5	8	80
Dwarf shrub cover (%)	0	1	5
Herb cover (%)	3	5	60
Bryophyte cover (%)	3	5	50
Needle litter cover (%)	85	80	3
Brash cover (%)	10	5	5
No of species present	5	14	21
Date of survey	10/10/03	29/8/04	22/8/06
<i>Hypnum cupressiforme</i>	2	2	2
<i>Molinia caerulea</i>	2	3	5
<i>Dryopteris dilatata</i>	1	1	1
<i>Thuidium tamariscinum</i>	1	1	-
<i>Rhytidiadelphus loreus</i>	1	-	-
<i>Polytrichum</i> sp.		2	3
<i>Agrostis</i> sp.		1	2
<i>Calluna vulgaris</i>		1	3
<i>Potentilla erecta</i>		1	-
<i>Luzula multiflora</i>		1	1
<i>Epilobium</i> sp.		1	1
<i>Pinus contorta</i> (seedlings)		1 (2 counted)	-
<i>Rubus fruticosus</i>		1	1
<i>Sorbus aucuparia</i> (seedlings)		1	1
<i>Juncus</i> sp.		1	-
<i>Campylopus introflexus</i>			5
<i>Juncus effusus</i>			3
<i>Epilobium angustifolium</i>			2
<i>Juncus bulbosus</i>			2
<i>Carex echinata</i>			2
<i>Digitalis purpurea</i>			1
<i>Erica tetralix</i>			1
<i>Juncus squarrosus</i>			1
<i>Betula pubescens</i> (saplings)			1
<i>Eriophorum angustifolium</i>			1
<i>Juncus squarrosus</i>			1
<p>History – Area on sloping ground previously dominated by Lodgepole pine trees planted in the early 1990's. Trees were generally between 6 and 8 metres tall. Ground vegetation dominated by pine needles. Trees felled in the summer of 2003.</p>			



Permanent quadrat 3 – October 2003



Permanent quadrat 3 – August 2006

Site - Drumalohurt			
Code - PQ3			
GPS - V 69769 81282			
Near Walrag? - No			
Size (m) - 6 x 6			
Slope (Degrees) - 5 - 10			
Vegetation cover (%)	35	45	75
Dwarf shrub cover (%)	1	1	3
Herb cover (%)	1	1	15
Bryophyte cover (%)	35	45	65
Needle litter cover (%)	20	10	0
Brash cover (%)	40	35	25
Bare ground cover (%)	0	5	5
No of species present	10	16	26
Date of survey	10/10/03	29/8/04	22/8/06
<i>Thuidium tamariscinum</i>	4	4	3
<i>Hypnum cupressiforme</i>	4	4	5
<i>Rhytiadelphus loreus</i>	3	3	4
<i>Polytrichum commune</i>	2	2	4
<i>Dicranum scoparium</i>	2	2	2
<i>Plagiothecium undulatum</i>	1	2	-
<i>Sphagnum capillifolium</i>	1	2	1
<i>Sphagnum palustre</i>	1	1	2
<i>Dryopteris dilatata</i>	1	1	2
<i>Ilex aquifolium</i> (seedlings)	1	1	1
<i>Calluna vulgaris</i>		1	2
<i>Rhytiadelphus triquetrus</i>		1	-
<i>Molinia caerulea</i>		1	2
<i>Erica tetralix</i>		1	2
<i>Juncus</i> sp.		1	-
<i>Hylocomium splendens</i>		1	3
<i>Campylopus introflexus</i>			5
<i>Eriophorum angustifolium</i>			2
<i>Juncus effusus</i>			1
<i>Carex echinata</i>			1
<i>Epilobium</i> sp.			1
<i>Rubus fruticosus</i>			1
<i>Epilobium angustifolium</i>			1
<i>Drosera rotundifolia</i>			1
<i>Juncus bulbosus</i>			1
<i>Potentilla erecta</i>			1
<i>Blechnum spicant</i>			1
<i>Sphagnum cuspidatum</i>			1
<i>Rhynchospora alba</i>			1
History – Previously dominated by fairly well-grown Sitka spruce planted in the early 1980's. Trees were generally between 6 and 8 metres tall. Ground vegetation dominated by mosses. Trees felled in the summer of 2003. The southern half of the quadrat is dominated by a thick brash mat. Drains blocked in Spring 04.			



Permanent quadrat 4 – October 2003



Permanent quadrat 4 – August 2006

Site - Drumalohurt			
Code - PQ4			
GPS - V 69853 81249			
Near Walrag? - No			
Size (m) - 6 x 6			
Slope (Degrees) - 3 to 5			
Vegetation cover (%)	90	90	100
Dwarf shrub cover (%)	0	1	3
Herb cover (%)	5	15	70
Bryophyte cover (%)	90	90	90
Needle litter cover (%)	3	3	1
Bare ground cover (%)	3	1	0
No of species present	14	25	27
Date of survey	10/10/03	29/8/04	22/8/06
<i>Hypnum cupressiforme</i>	5	6	5
<i>Eurhynchium praelongum</i>	4	3	3
<i>Sphagnum capillifolium</i>	4	4	4
<i>Thuidium tamariscinum</i>	3	3	2
<i>Sphagnum palustre</i>	3	3	3
<i>Molinia caerulea</i>	3	4	5
<i>Rhytidiadelphus loreus</i>	3	3	-
<i>Polytrichum</i> spp.	2	2	3
<i>Plagiothecium undulatum</i>	2	2	-
<i>Dicranum scoparium</i>	1	1	1
<i>Potentilla erecta</i>	1	1	2
<i>Blechnum spicant</i>	1	-	-
<i>Dryopteris dilatata</i>	1	1	1
<i>Sphagnum cuspidatum</i>	1	1	1
<i>Campylopus</i> sp.		3	4
<i>Agrostis</i> spp.		1	3
<i>Betula pubescens</i> (seedlings)		1	1
<i>Calluna vulgaris</i>		1	2
<i>Carex echinata</i>		1	3
<i>Hylocomium splendens</i>		1	-
<i>Juncus bufonius</i>		1	-
<i>Juncus bulbosus</i>		1	2
<i>Luzula multiflora</i>		1	1
<i>Pseudoscleropodium purum</i>		1	-
<i>Rubus fruticosus</i>		1	1
<i>Sorbus aucuparia</i> (seedling)		1	1
<i>Sphagnum papillosum</i>			3
<i>Holcus lanatus</i>			2
<i>Juncus effusus</i>			2
<i>Erica tetralix</i>			1
<i>Eriophorum angustifolium</i>			1
<i>Epilobium angustifolium</i>			1
<i>Campylopus atrovirens</i>			1
History – Previously dominated by fairly well-grown Sitka spruce planted in the early 1980's. Trees were generally between 6 and 8 metres tall. Ground vegetation dominated by mosses (esp. <i>Hypnum</i>). Trees felled in the summer of 2003.			



Permanent quadrat 5 – September 2004



Permanent quadrat 5 – August 2006

Site - Drumalohurt		
Code - PQ5		
GPS - V 69956 81116		
Near Walrag? - No		
Size (m) - 7x7		
Slope (Degrees) - 10 to 15		
Vegetation cover (%)	80	95
Dwarf shrub cover (%)	1	5
Herb cover (%)	15	70
Bryophyte cover (%)	75	80
Needle litter cover (%)	5	0
Surface water in drains cover (%)	3	-
Brash cover (%)	5	2
No of species present	14	23
Date of survey	29/8/04	22/8/06
<i>Hypnum cupressiforme</i>	5	5
<i>Molinia caerulea</i>	4	5
<i>Rhytiadelphus loreus</i>	4	3
<i>Sphagnum capillifolium</i>	4	4
<i>Dicranum scoparium</i>	2	2
<i>Hylocomium splendens</i>	2	3
<i>Polytrichum commune</i>	2	3
<i>Thuidium tamariscinum</i>	2	2
<i>Calluna vulgaris</i>	1	2
<i>Dryopteris dilatata</i>	1	2
<i>Erica tetralix</i>	1	2
<i>Ilex aquifolium</i> (seedlings)	1	1
<i>Juncus bulbosus</i>	1	2
<i>Juncus</i> sp.	1	-
<i>Eriophorum angustifolium</i>		2
<i>Campylopus</i> sp.		2
<i>Betula pubescens</i> (Seedlings)		1
<i>Potentilla erecta</i>		1
<i>Pleurozium schreberi</i>		1
Liverwort species		1
<i>Sphagnum palustre</i>		1
<i>Luzula multiflora</i>		1
<i>Juncus effusus</i>		1
<i>Rhytiadelphus squarrosus</i>		1
History - Previously dominated by fairly well-grown Sitka spruce planted in the early 1980's. Trees were generally between 6 and 8 metres tall. Ground vegetation dominated by mosses (esp. <i>Hypnum</i>). Trees felled in the summer of 2003. Quadrat located c. 300 metres south of PQ4.		

REFERENCES

- Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book. 1: Vascular Plants*. The Stationery Office, Dublin.
- Dahl, E. (1968). *Analytical Key to British Macrolichens* (2nd ed.). British Lichen Society, London.
- Douglas, C., Garvey, L., Kelly, L. and O' Sullivan, A. (1989). *A survey to locate blanket bogs of scientific interest in County Kerry and County Sligo*. A report commissioned by The Wildlife Service, Office of Public Works, Dublin.
- Mueller-Dombois, D. & Ellenberg, H. (1974). *Aims and Methods in Vegetation Ecology*. Wiley, New York.
- Smith, A.J.E. (2004). *The Moss Flora of Britain and Ireland* (2ND edition). University Press, Cambridge.
- Smith, A.J.E. (1990). *The Liverworts of Britain and Ireland*. University Press, Cambridge.
- Stace, C. (1997). *New Flora of the British Isles* (2ND edition). University Press, Cambridge.