

RESTORING ACTIVE BLANKET BOG IN IRELAND

Project reference: LIFE02NAT/IRL/8490

A REPORT ON THE RESTORATION OF PROJECT SITE No. 10.
GLENCULLIN LOWER, CO. MAYO.



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Project Site No. 10 Glencullin Lower, Co. Mayo**1. Introduction**

Grid reference F 865 266	Elevation (m) 25 to 80	Bedrock geology Quartzite
SAC Name and number Carrowmore Lake Complex (476)	Site area (ha) 28.6	Main restoration methods Fencing of site in order to exclude grazing animals
Area of conifer cover (ha) 0	Area of open bog and heath (ha) 28.6	
Noteworthy plant/animal species occurring on site None recorded		

Glencullin Lower is an area of open and unplanted blanket bog occurring on the northern flanks of a low, but relatively steeply sloping ridge, located 4 kilometres north of Bangor-Erris village, Co. Mayo. The site comprises 28.6 hectares of blanket bog and wet heath, a small portion of which is old cutover surface. The site area lies within the Carrowmore Lake Complex Special Area of Conservation.

The site is unplanted but was included within the project in order to explore the impacts of grazing on blanket bog. The blanket bog present shows typical features of the habitat, including shallow, interconnecting surface channels and vegetation dominated by purple moor-grass (*Molinia caerulea*), black bog-rush (*Schoenus nigricans*), deer-sedge (*Trichophorum cespitosum*), cross-leaved heath (*Erica tetralix*) and lichens (including *Cladonia portentosa*). On the upper slopes of the low hill the peat depth is relatively shallow, i.e. < 1.5 metres deep, and the vegetation is dominated by ling heather (*Calluna vulgaris*) accompanied by species such as green-ribbed sedge (*Carex binervis*) and heath rush (*Juncus squarrosus*).

The main restoration measure at this site was the fencing of the entire site in order to exclude grazing sheep which have grazed the site heavily in the recent past.

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.

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 illustrate 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 view of the site taken from the road which runs along its northern boundary. The site extends to the top of the low hill in the distance. The blanket bog in the foreground was partially cut for peat in the past but is now recovering.



The blanket bog at this site consists of rather uniform bog dominated by *Schoenus nigricans*, *Molinia caerulea* and *Erica tetralix*. Wet pools are absent and the hummocky nature of the bog surface suggests that the site has suffered from overgrazing in the recent past. Photograph taken in September, 2007.



On the higher slopes of the site the shallower peat supports a more heathy vegetation in which *Molinia caerulea*

and *Calluna vulgaris* are the main species. Photograph taken in September, 2007.



A view along the eastern fenceline of the site. This photograph clearly shows that grazing pressure is similar, i.e. very low, on both sides of the fence. Photograph taken in September, 2007.



At the summit of the hill there is some erosion of blanket bog with low peat hags a feature. It is not clear whether this erosion is primarily the result of natural factors or overgrazing. Photograph taken in September, 2003.



An aerial photograph of the Glencullin Lower site prior to the start of restoration activities. Site outline in red.
Aerial photograph taken in the year 2000.

4. Vegetation of the site

The vegetation of this site is relatively uniform with ombrotrophic bog vegetation dominating throughout. Blanket bog pools and flushes are absent and even bare peat areas have a very restricted occurrence. On the flatter, northern half of the site the blanket bog vegetation has an uneven surface which is largely due to overgrazing/erosion which occurred in the recent past. It must be noted however that the habitat is now well on the way to recovery. Areas of intact, undrained bog tend to be dominated by species such as *Molinia caerulea*, *Trichophorum cespitosum*, *Calluna vulgaris*, *Eriophorum angustifolium*, *Erica tetralix* and the mosses *Sphagnum capillifolium* and *Sphagnum tenellum*. The high cover of the lichen species *Cladonia portentosa* is also noteworthy and this high cover may be due to grazing disturbance in the past.

On the higher hill slopes within the site the vegetation is still dominated by typical blanket bog species however *Molinia caerulea* and *Calluna vulgaris* appear to have a higher cover. On the summit ridge of the hill, a number of small patches of eroding blanket bog occur and *Eriophorum angustifolium* is the main recolonizing species in these areas.

Table 2. Vegetation at Glencullin

Vegetation type	A	A	A	A	A	A	A	B
Quadrat code	GC1	GC2	GC3	GC4	GC5	GC6	GC7	G8
GPS grid letter	F	F	F	F	F	F	F	F
Easting	86689	86680	86660	86642	86320	86331	86346	86325
Northing	26565	26576	26589	26603	26660	26643	26623	26423
Quadrat size (m ²)	4	4	4	4	4	4	4	4
Slope (degrees)	<5	<3	0	<3	10-20	10-30	10-20	10-20
Vegetation cover (%)	90	99	80	98	75	60	85	30
Bare rock (%)	0	0	0	0	0	0	0	0
Bare soil (%)	10	1	25	2	25	40	20	75
Open water (%)	0	0	0	0	0	0	0	0
Dwarf shrub cover (%)	55	40	40	30	40	30	30	2
Herb cover (%)	50	70	60	75	60	45	65	30
Bryophyte cover (%)	75	80	60	50	60	35	50	1
Ht. of vegetation (cm)	10-20	15-25	10-20	15-25	10-15	10-20	5-15	10-20
No. of species	21	20	21	19	19	18	18	9
<i>Molinia caerulea</i>	6	6	6	8	6	4	5	5
<i>Sphagnum tenellum</i>	3	5	4	5	4	4	5	1
<i>Trichophorum cespitosum</i>	5	6	4	4	5	6	7	3
<i>Calluna vulgaris</i>	7	5	5	5	5	5	5	1
<i>Erica tetralix</i>	5	5	5	5	5	5	5	1
<i>Eriophorum angustifolium</i>	4	3	4	3	3	3	3	5
<i>Cladonia portentosa</i>	8	7	7	4	5	4	5	
<i>Racomitrium lanuginosum</i>	4	4	4	4	5	4	3	
<i>Cladonia uncialis</i>	3	4	4	1	3	2	2	
<i>Potentilla erecta</i>	1	2	2	2	2	3	2	
<i>Erica cinerea</i>	3	4	4		4	4	3	
<i>Schoenus nigricans</i>	3	4	5	4	4		1	
<i>Pleurozia purpurea</i>	4	5	3		5	4	5	
<i>Pedicularis sylvatica</i>	2	1		1	1	2	1	
<i>Sphagnum capillifolium</i>	4	3	4	4	5			
<i>Hypnum cupressiforme</i>	4	3		2		1	1	
<i>Rhynchospora alba</i>	3	3	5	3				2
<i>Carex panicea</i>			1	3	1	4	4	
<i>Polygala serpyllifolia</i>	1	1	1	1				
<i>Campylopus atrovirens</i>	4	4	3				3	
<i>Leucobryum glaucum</i>		4			4	2	5	
<i>Drosera rotundifolia</i>			2		1	2		1
<i>Sphagnum papillosum</i>			4	6				
<i>Narthecium ossifragum</i>				4				1
<i>Eriophorum vaginatum</i>	4							
<i>Odontoschisma sphagni</i>	1							
<i>Sphagnum cuspidatum</i>			1					
<i>Diplohyllum albicans</i>					1			

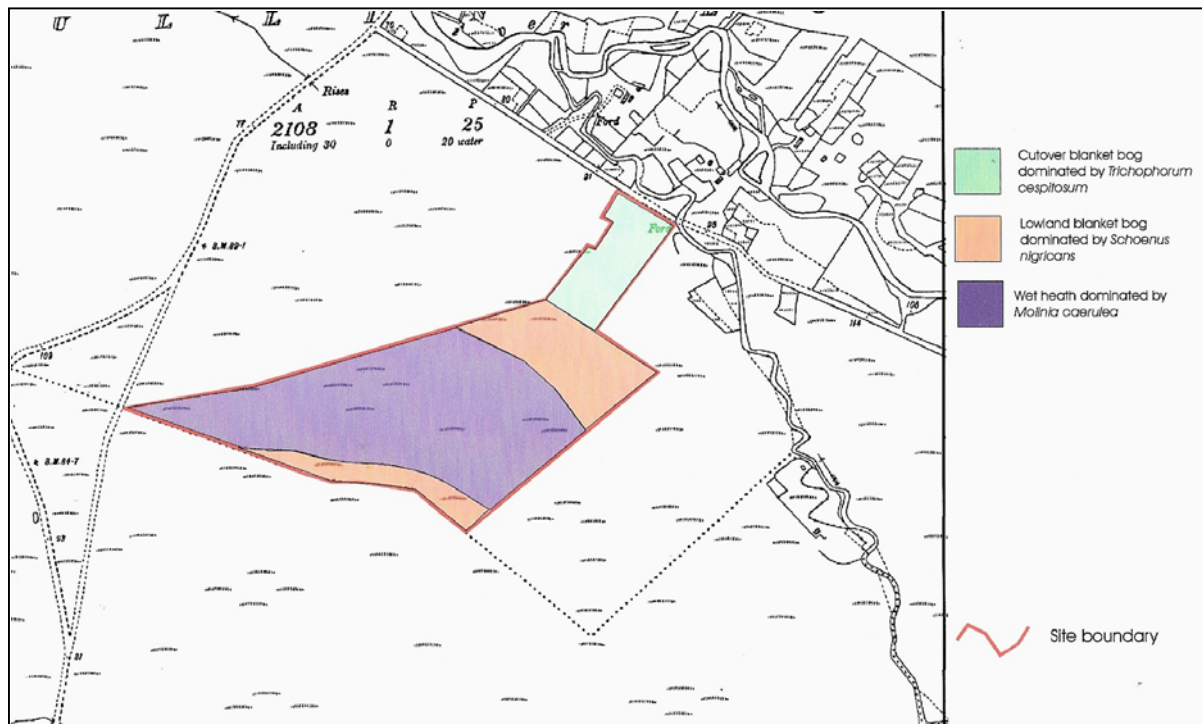
<i>Campylopus introflexus</i>	2
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A = Intact lowland blanket bog

B = Eroded bog on hill summit

5. Changes in overall vegetation/habitat cover

In general there has been relatively little change in the vegetation of this site throughout the lifetime of the project. The site had been initially identified as a good candidate for grazing exclusion trials in the late 1990's due to the fact that the hillside had been heavily grazed during the 1980's and early 1990's. Since the mid-1990's however there appears to have been a steady reduction in stock numbers (both sheep and cattle) grazing the site and this continues to this day. This has resulted in the fact that there is now little difference evident in the vegetation of blanket bog habitat inside and outside of the fenced area (see site photograph section).



A map of habitat/vegetation cover at Glencullin Lower prior to the start of restoration.

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 3 permanent quadrats were described and photographed. In the case of each quadrat photographs and vegetation tables are presented. 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. 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

No photographs are available for the following monitoring quadrats.

Site – Glencullin Lower		
Code - PQ1		
GPS – F 86530 26688		
Size (m) – 8x8		
Slope (Degrees) – <3		
Vegetation cover (%)	95	95
Bare ground cover (%)	10	5
Dwarf shrub cover (%)	35	35
Herb cover (%)	75	75
Bryophyte cover (%)	75	75
No of species present	20	20
Date of survey	6-9-03	3-9-07
<i>Cladonia portentosa</i>	5	5
<i>Molinia caerulea</i>	5	5
<i>Schoenus nigricans</i>	5	5
<i>Calluna vulgaris</i>	4	4
<i>Eriophorum angustifolium</i>	4	4
<i>Erica tetralix</i>	4	4
<i>Racomitrium lanuginosum</i>	4	4
<i>Sphagnum capillifolium</i>	4	4
<i>Pleurozia purpurea</i>	3	3
<i>Sphagnum tenellum</i>	3	3
<i>Campylopus atrovirens</i>	2	3
<i>Odontoschisma sphagni</i>	2	2
<i>Rhynchospora alba</i>	2	3
<i>Trichophorum cespitosum</i>	2	3
<i>Cladonia uncialis</i>	1	2
<i>Drosera rotundifolia</i>	1	1
<i>Erica cinerea</i>	1	2
<i>Potentilla erecta</i>	1	1
<i>Hypnum cupressiforme</i>	2	-
<i>Leucobryum glaucum</i>	2	-
<i>Sphagnum auriculatum</i>	-	2
<i>Carex panicea</i>	-	1

Comments – Area fenced off during summer 2003.

Site – Glencullin Lower		
Code – PQ2		
GPS – F 86614 26609		
Size (m) – 8x8		
Slope (Degrees) – 0		
Vegetation cover (%)	95	98
Bare ground cover (%)	5	2
Dwarf shrub cover (%)	30	30
Herb cover (%)	70	70
Bryophyte cover (%)	80	80
No of species present	19	20
Date of survey	6-9-03	3-9-07
<i>Calluna vulgaris</i>	5	5
<i>Cladonia portentosa</i>	5	5
<i>Molinia caerulea</i>	5	5
<i>Erica tetralix</i>	4	4
<i>Eriophorum angustifolium</i>	4	4
<i>Schoenus nigricans</i>	4	4
<i>Sphagnum capillifolium</i>	4	4
<i>Trichophorum cespitosum</i>	4	4
<i>Odontoschisma sphagni</i>	3	3
<i>Pleurozia purpurea</i>	3	3
<i>Campylopus atrovirens</i>	2	2
<i>Cladonia uncialis</i>	2	3
<i>Leucobryum glaucum</i>	2	3
<i>Racomitrium lanuginosum</i>	2	2
<i>Sphagnum tenellum</i>	2	3
<i>Carex panicea</i>	2	1
<i>Rhynchospora alba</i>	1	1
<i>Polygala serpyllifolia</i>	2	-
<i>Sphagnum papillosum</i>	-	3
<i>Hypnum cupressiforme</i>	-	1
<i>Potentilla erecta</i>	-	1
Comments – Area fenced off during summer 2003.		

Site – Glencullin Lower		
Code – PQ3		
GPS – F 86320 26425		
Size (m) – 4x4		
Slope (Degrees) – 3 to 10		
Vegetation cover (%)	30	35
Bare ground cover (%)	70	70
Dwarf shrub cover (%)	0	1
Herb cover (%)	30	35
Bryophyte cover (%)	5	5
No of species present	9	11
Date of survey	6-9-03	3-9-07
<i>Eriophorum angustifolium</i>	4	4
<i>Molinia caerulea</i>	4	4
<i>Trichophorum cespitosum</i>	2	2
<i>Sphagnum capillifolium</i>	2	2
<i>Campylopus atrovirens</i>	2	2
<i>Hypnum cupressiforme</i>	2	2
<i>Carex panicea</i>	1	2
<i>Drosera rotundifolia</i>	1	1
<i>Potentilla erecta</i>	1	-
<i>Rhynchospora alba</i>	-	2
<i>Erica tetralix</i>	-	1
<i>Racomitrium lanuginosum</i>	-	1
Comments – Eroding summit area fenced off during summer 2003.		

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