

# RESTORING ACTIVE BLANKET BOG IN IRELAND

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A REPORT ON THE RESTORATION OF PROJECT SITE No. 17.  
CORRAVOKEEN, CO. MAYO



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**Project site Number 17 - Corravokeen, Co. Mayo (Extension site)****1. Introduction**

<b>Grid reference</b> G 05 22	<b>Elevation (m)</b> 65 to 80	<b>Bedrock geology</b> Sandstone
<b>SAC Name and number</b> Adjoins the Bellacorrick Bog Complex (1922)	<b>Site area (ha)</b> ?	<b>Main restoration methods</b> Commercial felling and fell to waste of conifer crop. Drain-blocking.
<b>Area of conifer cover (ha)</b> ?	<b>Area of open bog/flush (ha)</b> 17.6	<b>Area of dystrophic lake (ha)</b> 1.5
<b>Noteworthy plant/animal species occurring</b> <i>Tomenthypnum nitens</i> , <i>Vaccinium oxycoccus</i> .		

Corravokeen lies along the eastern edge of the Bellacorrick Bog Complex Special Area of Conservation. This site is one of the largest blanket bog-dominated SACs in Ireland and thus ranks as one of the most important blanket bog landscapes in Europe.

The property is dominated by a relatively productive conifer crop which was planted in the 1970's. Most of the coniferous woodland areas which adjoin the open bog of the SAC on its western side have been recently felled and are being restored to blanket bog. Any significant drains will be blocked in order to raise the water table within the peat. In addition to these productive areas of plantation there are also areas dominated by low-yielding conifers (mainly Sitka spruce) which still retain a reasonably intact blanket bog flora. The low-yielding trees in these areas have been felled to waste and left lying on the surface.

The site also contains a number of small "islands" of largely intact blanket bog habitat and dystrophic bog lakes which are generally surrounded by conifer plantation. These areas of open blanket bog habitat support a number of floristically-rich flushes which contain a range of rare plant species such as cranberry (*Vaccinium oxycoccus*) and the moss *Homalothecium nitens*. Such species-rich flush systems within blanket bogs are very rare in Ireland and are thus considered to be of the highest conservation value.

## 2. Methods

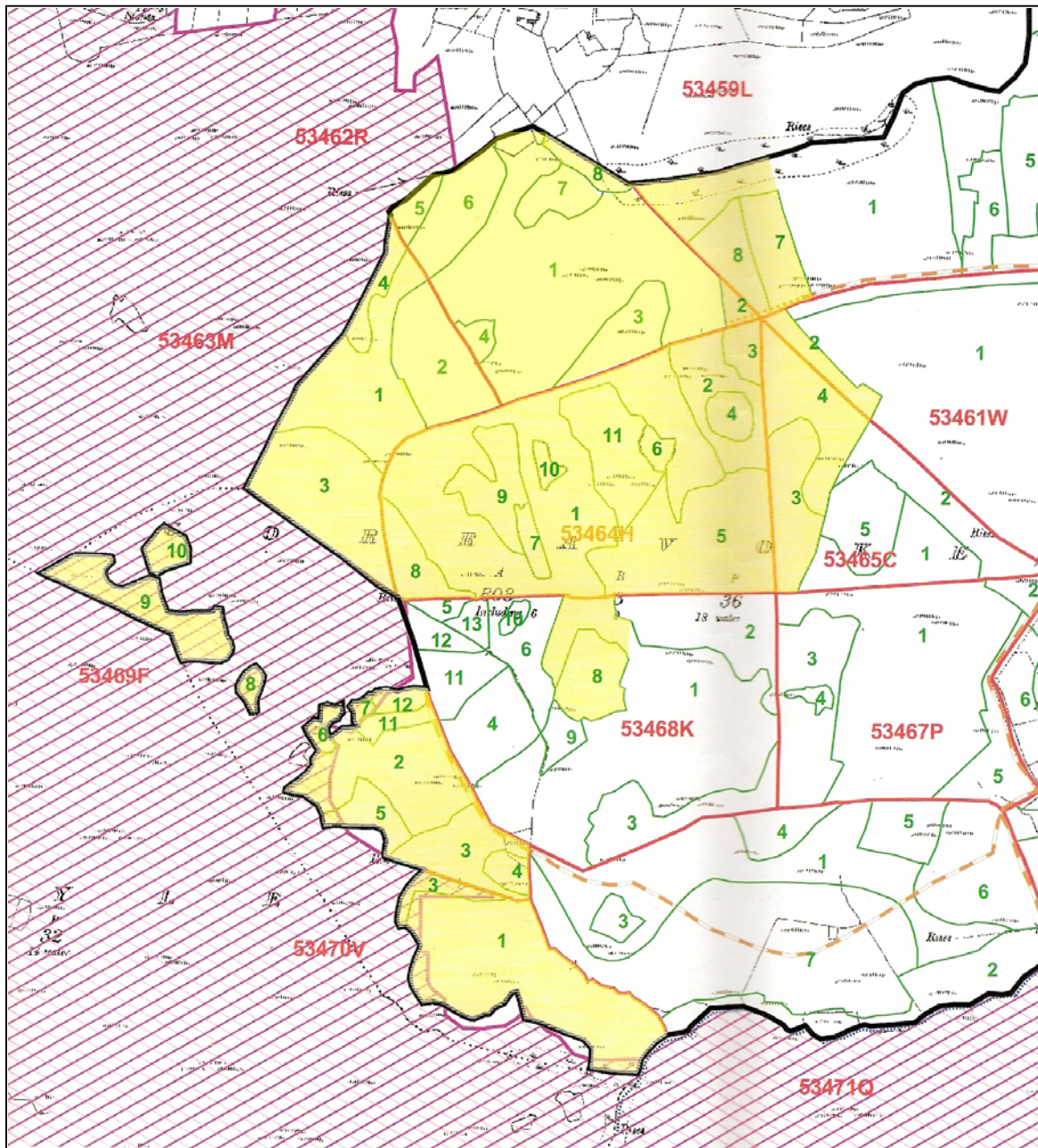
Prior to the start of restoration activities at the site the habitats and vegetation occurring were surveyed and described. Habitats occurring were mapped with the aid of a vertical aerial photograph of the site taken in the year 2000 by the Ordnance Survey of Ireland.

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. 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 map of the Corravokeen restoration site. The yellow colour indicates areas included within the restoration site. The purple hatched areas lie within the Bellacorick Bog Complex SAC.



An aerial photograph of the Corravokeen site prior to restoration work taking place. Aerial photograph taken in the year 2000. No post-restoration aerial photograph is available.



Much of this restoration site currently consists of recently clearfelled conifer plantation on deep blanket bog. The ground surface is now dominated by tree stumps, brash and needles with species such as *Epilobium angustifolium* and *Rubus fruticosus* prominent. Photograph taken in July 2007.



Within these clearfelled areas ground conditions are often very wet even without any drain-blocking being carried



out. Here we see a small, iron-rich *Phragmites* flush surrounded by recently cleared plantation. Photograph taken in July 2007.



The property contains a number of small flush areas which are surrounded by planted bog. Plant species such as *Cladium mariscus* and *Phragmites australis* are common in these areas. Photograph taken in October 2007.



The nationally rare moss *Tomenthyllum nitens* also grows in these small bog flushes. The presence of this species indicates the influence of base-rich flushing water. Photograph taken in October 2007.





Prior to tree felling at this site much of the ground covered by tall coniferous plantation looked much like this with a species-poor ground flora dominated by conifer needles and occasional clumps of moss. Picture taken in August 2005



In the northern part of this site there are areas of bog planted with low-yielding conifers which have been felled to

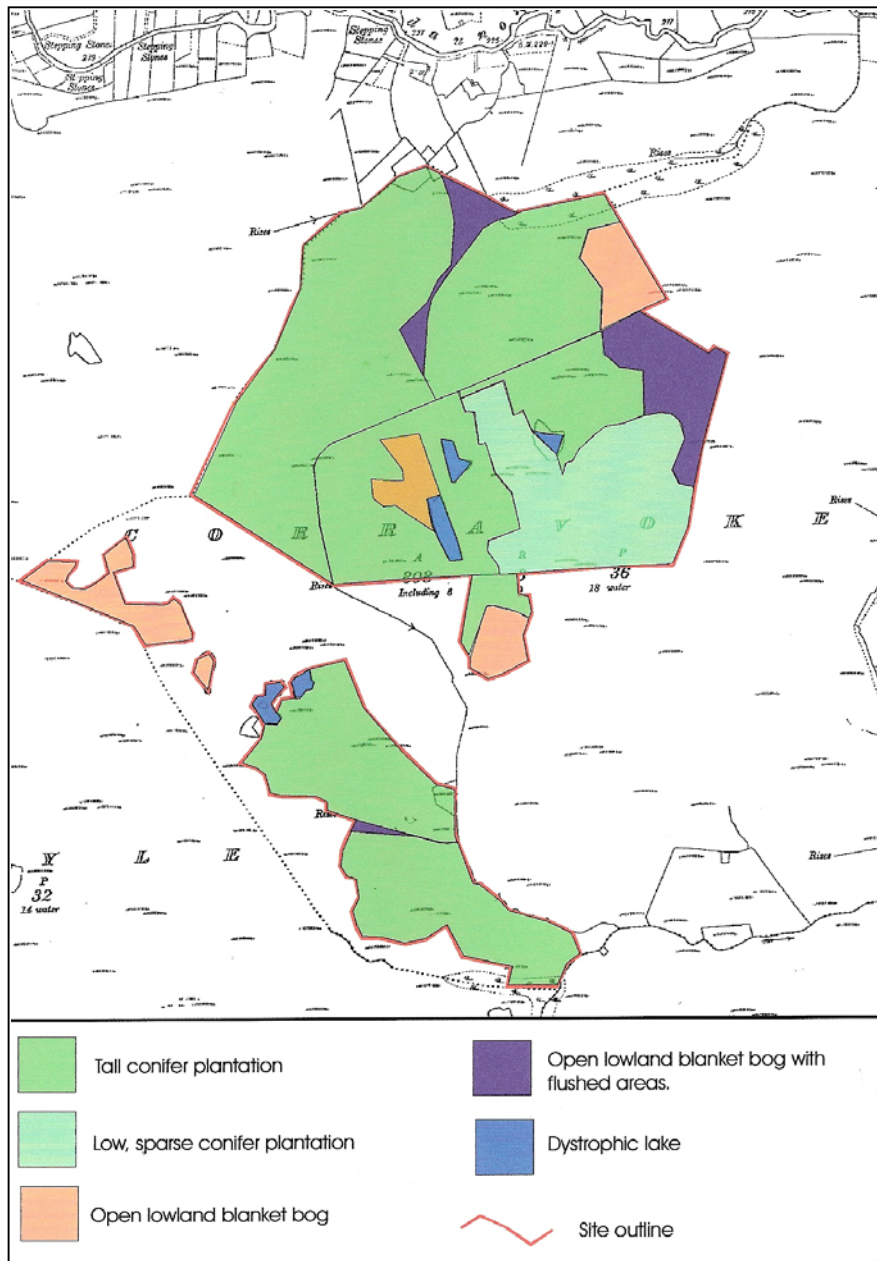
waste. As can be seen from the photograph the blanket bog flora is still well developed with drains largely absent.  
Picture taken in August 2005.

#### 4. Vegetation of the site

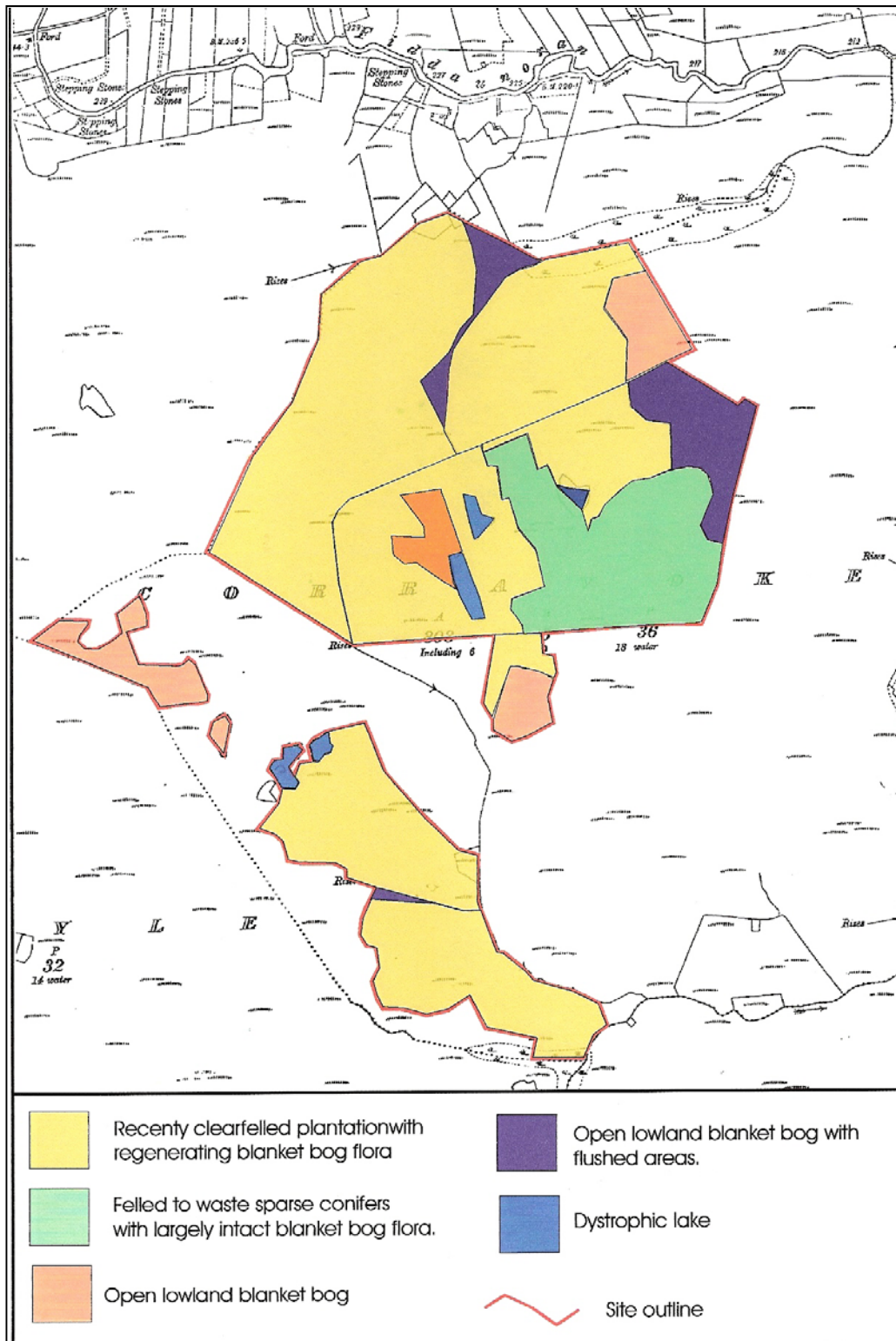
Prior to the start of restoration work at this site the majority of the restoration areas were dominated by tall coniferous plantation with a very species-poor ground flora. In common with most of the other areas of tall conifers on blanket bog within the project the ground vegetation was dominated by a thick layer conifer needles and a sparse cover of mosses such as *Hypnum cupressiforme*, *Rhytidiadelphus loreus* and *Thuidium tamariscinum*. Blanket bog areas with a cover of young/low-yielding conifers still contain a relatively intact blanket bog flora dominated by species such as *Molinia caerulea*, *Calluna vulgaris*, *Eriophorum angusifolium*, *Schoenus nigricans*, *Cladonia portentosa* and *Sphagnum capillifolium*. The open bog areas support a number of flushed blanket bog areas which were too wet to plant with trees. These areas are floristically species-rich and are characterised by the presence of wetland/flush species such as *Phragmites australis*, *Cladium marsicus*, *Schoenus nigricans* and *Potamogeton polygonifolius*.

### 5. Changes in overall vegetation/habitat cover

The majority of this site area was dominated by tall conifer plantation which has now been replaced with extensive areas of open peatland surface where a blanket bog vegetation is slowly recovering. At this early stage in the restoration process vegetation changes are only visible in the areas which were cleared of a commercial conifer crop. The main recolonizing species tend to be ones typical of recently disturbed habitats such as *Rubus fruticosus*, *Dryopteris dilatata* and *Juncus* spp. however it is anticipated that the cover of these species will decline over time as the blanket bog get progressively poorer in nutrients. A number of examples of this recovering bog vegetation are presented in the permanent monitoring quadrats section of the report.



A map of habitat/vegetation cover prior to the onset of restoration work at Corravokeen.



A map of habitat/vegetation cover following restoration work at Corravokeen.



## 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. In order to ensure the future relocation of quadrats the corners have been marked with short wooden sticks and a 10-figure GPS reading was also recorded. A total of 5 permanent quadrats were described and photographed at this site. In the case of each quadrat photographs and vegetation tables are presented. The cover of plant species within 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

Vegetation recovery at this site is dictated by the size/age of the conifer plantation which previously grew. In the areas which were dominated by a tall, commercial quality, conifer crop the vegetation is still very sparse after a couple of years following tree removal. Typical species which are prominent in these areas include *Juncus effusus*, *Rubus fruticosus*, *Epilobium angustifolium*, *Dryopteris dilatata*, *Molinia caerulea* and the moss *Hypnum cupressiforme*. The cover of these species varies considerably within the site. The dominance of these plants species, which are more typical of disturbed habitats, is viewed as a transitional phase and it is anticipated that these species will be replaced by more typical blanket bog species over time. Future monitoring of the vegetation changes at this site will reveal the speed of this change and the species involved.

In areas where the low-yielding conifers have felled been felled to waste there has been little visible change to the existing vegetation due to the very stunted condition of the conifer crop.



Permanent quadrat 1 – September 2006



Permanent quadrat 1 – July 2007

Site - Corravokeen		
Code - PQ1 – fell date Spring 2006		
GPS – G 06088 22131		
Size (m) - 6 x 6		
Slope (Degrees) – 0-3		
Vegetation cover (%)	40	90
Needle litter cover (%)	40	20
Brash cover (%)	20	20
Dwarf shrub cover (%)	20	25
Herb cover (%)	30	75
Bryophyte cover (%)	5	30
No of species present	18	16
Date of survey	13/9/06	20/7/07
<i>Rubus fruticosus</i>	4	5
<i>Holcus lanatus</i>	4	3
<i>Agrostis</i> sp.	3	5
<i>Juncus effusus</i>	3	4
<i>Epilobium angustifolium</i>	3	4
<i>Carex binervis</i>	2	3
<i>Eurhynchium praelongum</i>	3	3
<i>Potentilla erecta</i>	2	2
<i>Dryopteris dilatata</i>	2	2
<i>Hypnum cupressiforme</i>	1	4
<i>Cirsium palustre</i>	1	1
<i>Epilobium</i> sp.	1	1
<i>Galium saxatile</i>	1	-
<i>Juncus bulbosus</i>	1	-
<i>Picea sitchensis</i> (saplings)	1	-
<i>Plagiothecium undulatum</i>	1	-
<i>Stellaria media</i>	1	-
<i>Thuidium tamariscinum</i>	1	-
<i>Campylopus</i> sp.		3
<i>Polytrichum commune</i>		3
<i>Ranunculus flammula</i>		1
<i>Cerastium fontanum</i>		1
Comments – Tall Sitka spruce plantation area felled in early 2006. Peat depth <50cm in this area.		



Permanent quadrat 2 – September 2006



Permanent quadrat 2 – July 2007

Site - Corravokeen		
Code – PQ2 – fell date Spring 2006		
GPS – G 06094 22024		
Size (m) - 7 x 7		
Slope (Degrees) – 0-3		
Vegetation cover (%)	40	60
Needle litter cover (%)	20	10
Brash cover (%)	20	10
Surface water cover (%)	25	25
Dwarf shrub cover (%)	1	3
Herb cover (%)	5	20
Bryophyte cover (%)	30	50
No of species present	19	24
Date of survey	13/9/06	20/7/07
<i>Hypnum cupressiforme</i>	5	5
<i>Thuidium tamariscinum</i>	3	3
<i>Juncus bulbosus</i>	2	4
<i>Polytrichum commune</i>	2	2
<i>Dryopteris dilatata</i>	2	2
<i>Carex echinata</i>	1	2
<i>Rubus fruticosus</i>	1	2
<i>Epilobium angustifolium</i>	1	1
<i>Hypericum pulchrum</i>	1	1
<i>Juncus articulatus</i>	1	1
<i>Molinia caerulea</i>	1	1
<i>Pinus contorta</i> (seedlings)	1	1
<i>Potamogeton polygonifolius</i>	1	1
<i>Potentilla erecta</i>	1	1
<i>Salix</i> sp. (Seedlings)	1	1
<i>Stellaria media</i>	1	1
<i>Betula pubescens</i> (Seedlings)	1	-
<i>Picea sitchensis</i> (seedlings)	1	-
<i>Pinguicula lusitanica</i>	1	-
<i>Holcus lanatus</i>		2
<i>Agrostis</i> sp.		1
<i>Calluna vulgaris</i>		1
<i>Cirsium palustre</i>		1
<i>Epilobium</i> sp.		1
<i>Cardamine pratensis</i>		1
<i>Luzula multiflora</i>		1
<i>Juncus effusus</i>		1
Comments – Tall Sitka spruce plantation area felled in early 2006. Quadrat occurs just north of a flushed area with <i>Phragmites</i> .		



Permanent quadrat 3 – September 2006





Permanent quadrat 3 – July 2007

Site - Corravokeen		
Code – PQ3		
GPS – G 06126 22004		
Size (m) - 6 x 6		
Slope (Degrees) – 0		
Vegetation cover (%)	35	60
Needle litter cover (%)	10	5
Brash cover (%)	35	20
Open Water cover (%)	30	35
Dwarf shrub cover (%)	3	3
Herb cover (%)	20	35
Bryophyte cover (%)	25	30
No of species present	20	20
Date of survey	13/9/06	20/7/07
<i>Hypnum cupressiforme</i>	4	4
<i>Molinia caerulea</i>	4	3
<i>Juncus bulbosus</i>	3	5
<i>Polytrichum commune</i>	2	1
<i>Agrostis</i> sp.	1	2
<i>Salix</i> sp. (Seedlings)	1	2
<i>Potamogeton polygonifolius</i>	1	2
<i>Calluna vulgaris</i>	1	1
<i>Carex echinata</i>	1	1
<i>Epilobium</i> sp.	1	1
<i>Potentilla erecta</i>	1	1
<i>Rubus fruticosus</i>	1	1
<i>Thuidium tamariscinum</i>	1	1
<i>Pseudoscleropodium purum</i>	2	-
<i>Betula pubescens</i> (Seedlings)	1	-
<i>Cirsium</i> sp.	1	-
<i>Dryopteris dilatata</i>	1	-
<i>Hylocomium splendens</i>	1	-
<i>Pellia</i> sp.	1	-
<i>Stellaria media</i>	1	-
<i>Epilobium angustifolium</i>		2
<i>Juncus articulatus</i>		2
<i>Juncus effusus</i>		2
<i>Phragmites australis</i>		1
<i>Ranunculus flammula</i>		1
<i>Carex panicea</i>		1
<i>Anthoxanthum odoratum</i>		1
<p>Comments – Tall Sitka spruce plantation area felled in early 2006.            Quadrat occurs just north of a flushed area with <i>Phragmites</i>. It is thought likely that flush vegetation will recolonize at this location.</p>		





Permanent quadrat 4 – September 2006



Permanent quadrat 4 – August 2007

Site - Corravokeen		
Code – PQ4		
GPS – G 06139 21914		
Size (m) - 6 x 6		
Slope (Degrees) – 0		
Vegetation cover (%)	60	60
Needle litter cover (%)	10	10
Brash cover (%)	50	40
Dwarf shrub cover (%)	25	25
Herb cover (%)	25	35
Bryophyte cover (%)	35	35
No of species present	11	11
Date of survey	13/9/06	20/7/07
<i>Rubus fruticosus</i>	5	4
<i>Dryopteris dilatata</i>	4	4
<i>Hypnum cupressiforme</i>	4	4
<i>Thuidium tamariscinum</i>	4	3
<i>Epilobium angustifolium</i>	3	4
<i>Dicranum scoparium</i>	3	3
<i>Eurhynchium praelongum</i>	3	3
<i>Rhytidiadelphus loreus</i>	3	2
<i>Molinia caerulea</i>	2	2
<i>Potentilla erecta</i>	1	1
<i>Epilobium</i> sp.	1	-
<i>Calluna vulgaris</i>		1
Comments – Tall pine plantation area felled in early 2006. Peat depth >2 metres in this area.		



Permanent quadrat 5 – September 2006



Permanent quadrat 5 – July 2007



Site - Corravokeen		
Code – PQ5		
GPS – G 06058 21904		
Size (m) - 6 x 6		
Slope (Degrees) – 0		
Vegetation cover (%)	3	10
Needle litter cover (%)	75	60
Brash cover (%)	30	30
Dwarf shrub cover (%)	1	1
Herb cover (%)	2	7
Bryophyte cover (%)	5	5
No of species present	5	11
Date of survey	13/9/06	20/7/07
<i>Hypnum cupressiforme</i>	2	2
<i>Rumex acetosella</i>	1	3
<i>Calluna vulgaris</i>	1	1
<i>Dryopteris dilatata</i>	1	1
<i>Pinus contorta</i> seedlings	1	1
<i>Campylopus</i> sp.		2
<i>Dicranum scoparium</i>		1
<i>Eurhynchium praelongum</i>		1
<i>Molinia caerulea</i>		1
<i>Potentilla erecta</i>		1
<i>Rubus fruticosus</i>		1
Comments – Tall pine plantation area felled in early 2006. Peat depth >2 metres in this area.		

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