

RESTORING ACTIVE BLANKET BOG IN IRELAND

Project reference: LIFE02NAT/IRL/8490

A REPORT ON THE RESTORATION OF PROJECT SITE No. 20.
CAPPAGHOOSH, CO. GALWAY



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Project Site No. 20 - Cappaghoosh, Co. Galway (extension site)**1. Introduction**

Grid reference L 88 42	Elevation (m) 30 to 50	Bedrock geology Gneiss
SAC Name and number Some areas lie within the Connemara Bog Complex (2034)	Site area (ha) 354.7	Main restoration methods Fell to waste of conifer crop and drain-blocking
Area of conifer cover (ha) 189.2	Area of open bog/heath (ha) 165.5	
Noteworthy plant/animal species occurring <i>Deschampsia setacea</i> , <i>Eriocaulon aquaticum</i> , <i>Rhynchospora fusca</i> , <i>Sphagnum pulchrum</i> .		

The Connemara Bog Complex Special Area of Conservation is one of the largest areas of lowland blanket bog habitat in Ireland. This site stretches from the town of Spiddal in the east to Clifden in the west and dominates the southern half of the Connemara region. During the late-1970's to the mid-1980's a large area (c. 700ha) of this lake-studded blanket bog landscape was afforested at Cappaghoosh and Boheeshal. The main tree species planted were lodgepole pine and Sitka spruce and the blanket bog was extensively drained prior to planting. This block of forestry measures approximately 6km long by 3km wide and runs in a north-south direction, thus effectively cutting the west Connemara blanket bog landscape into two parts. The conifers in this forestry property have generally not grown well and many areas are considered to have limited commercial potential. In addition to afforested blanket bog a number of open blanket bog areas lie within the proposed restoration area. These areas still retain an intact bog flora which includes the rare moss species *Sphagnum pulchrum*. The legally protected grass *Deschampsia setacea* is also found growing in a number of the oligotrophic lakes which adjoin the restoration areas.

One of the afforested areas which still retains a well-developed, albeit modified, blanket bog flora occurs in the middle of the forestry block to the north and east of Lough Curreel. The trees in this area (mostly Sitka spruce) were planted between 1985 and 1988 and their yield class is low. The conifers in this area have been felled to waste in order to restore the blanket bog habitat. As the drainage network in this area is generally poorly functioning drain blocking at this site was minimal and was largely confined to the ends of the drains.

2. Methods

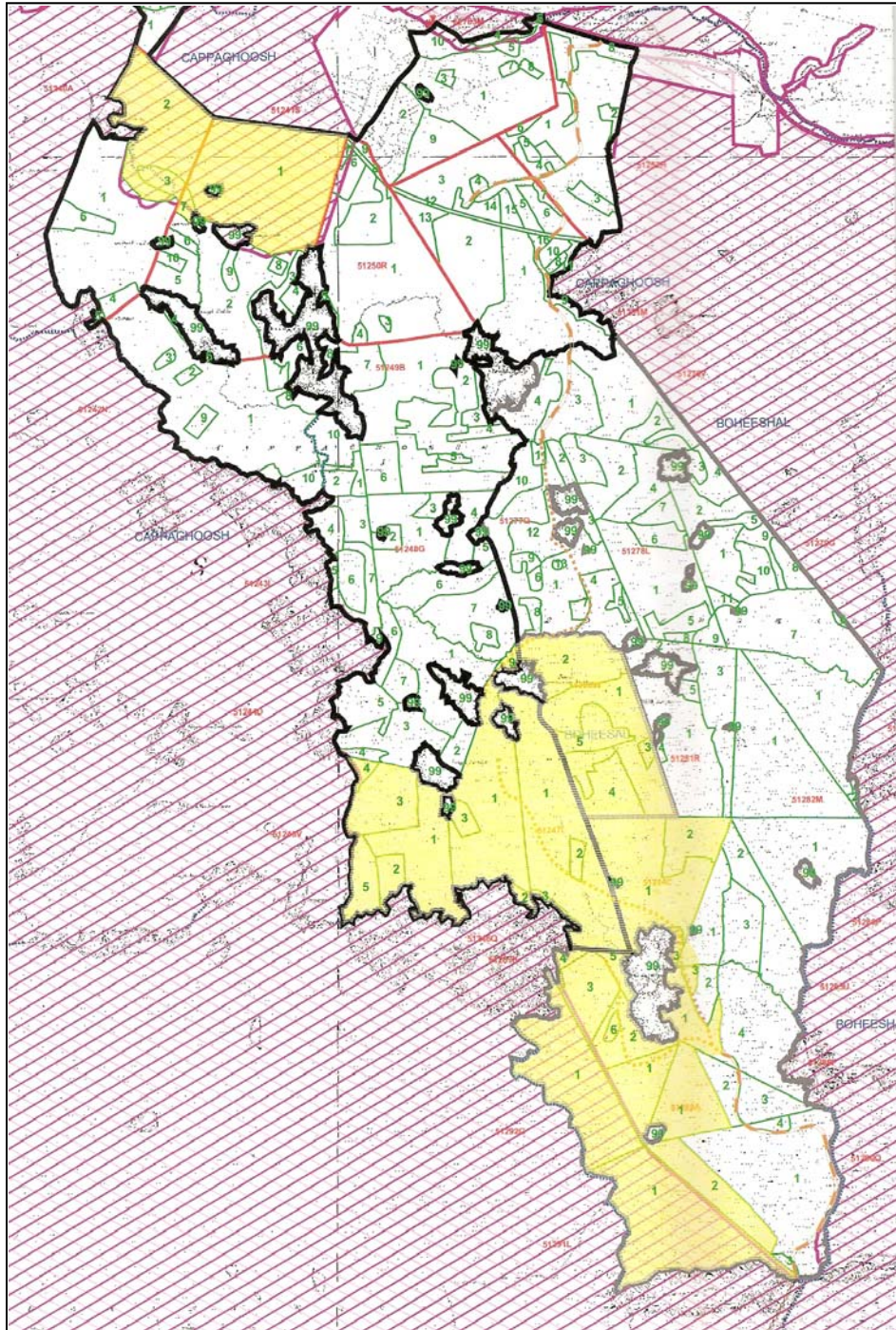
Prior to the start of restoration activities at the site a brief survey of the habitats and vegetation occurring was carried out. Habitats occurring were mapped with the aid of a vertical aerial photograph of the site taken in the year 2000 by the Ordnance Survey of Ireland.

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.

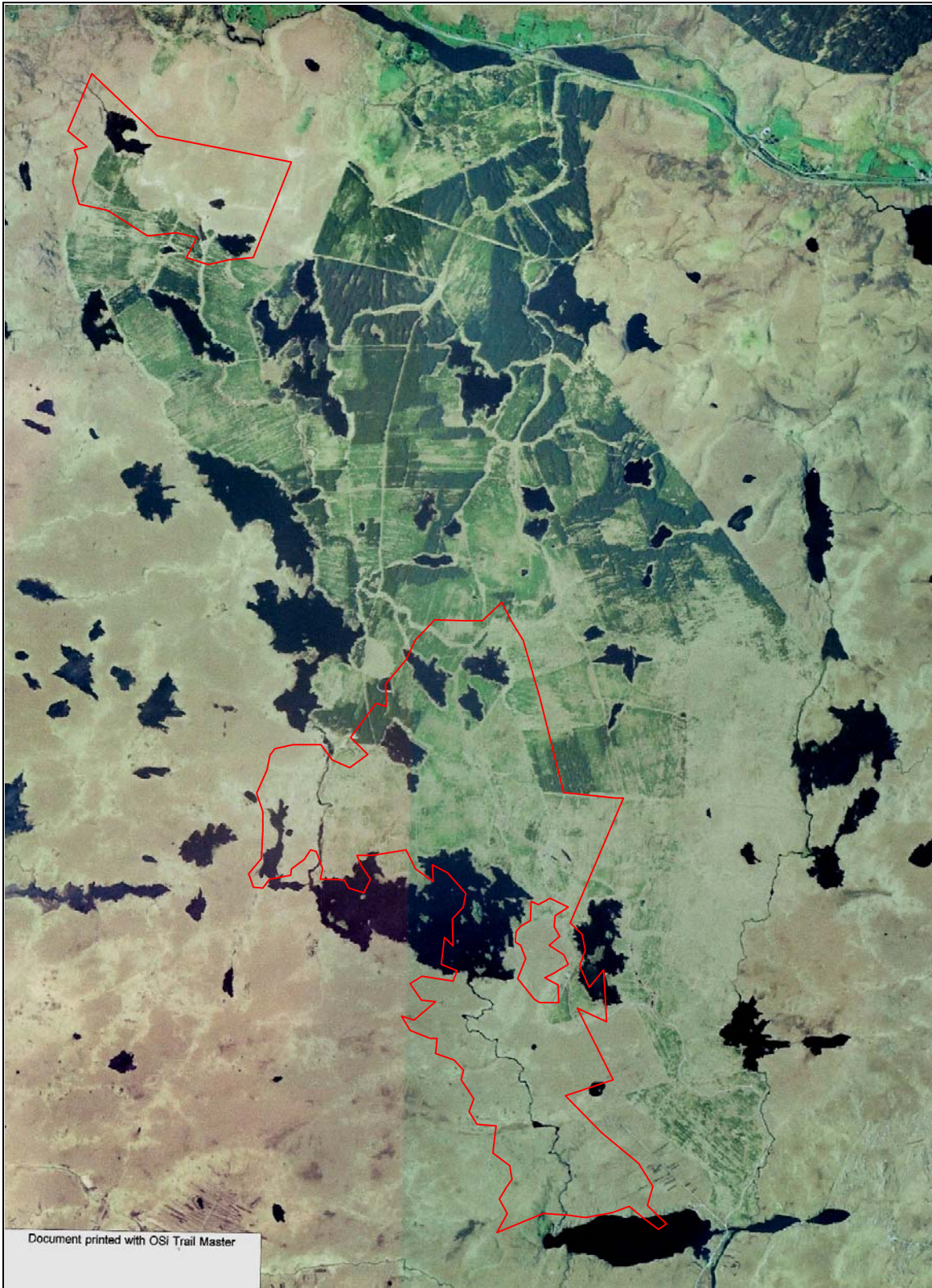
Plant species nomenclature in this report follows Stace (1997) for vascular plant, Smith (2004) for mosses, Smith (1991) for liverworts and Dahl (1968) for lichens.

3. Monitoring 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 Cappaghoosh restoration site. The yellow colour indicates areas included within the restoration area. The purple hatched areas lie within the Connemara Bog Complex SAC.



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



Much of this site consists of low-yielding conifer plantation on blanket bog. Oligotrophic lakes are frequent throughout the site. Photograph taken in August 2007.



A close-up view of stunted Sitka spruce plantation within the site. Note the presence of blanket bog vegetation under the tree canopy. Photograph taken in February 2007.



A view of felled to waste conifers within the site with *Molinia* starting to grow.



The nationally rare moss *Sphagnum pulchrum* grows along the margins of bog pools within the site. Photograph

taken in August 2007.



A general view of the high quality blanket bog habitat within Coillte ownership at the northern end of the site. This area already lies within the Connemara Bog Complex SAC.



This photograph is a dramatic illustration of the difference in tree growth rates within the site. Stunted Sitka spruce

(light green) dominates forestry in the left half of the photograph while much taller lodgepole pine (dark green) dominates in the right half.

4. Vegetation of the site

Most of this site was planted with a mixture of lodgepole pine and Sitka spruce in the mid-1980's. Whilst the growth of the lodgepole pine crop has been locally good, the Sitka spruce areas are generally poor with tree heights of between 3 and 6 metres typical. The poor growth has resulted in the persistence of a blanket bog flora within the Sitka spruce blocks. This bog vegetation is rather species-poor, with *Molinia caerulea*, *Calluna vulgaris*, *Hypnum cupressiforme*, *Cladonia portentosa* and *Sphagnum capillifolium* the most frequent species (see following monitoring quadrats)

In addition to the afforested areas of the site the restoration area contains two large unplanted areas of high quality blanket bog habitat which do not require any restoration. The dominant plant species in these intact areas are *Schoenus nigricans*, *Erica tetralix*, *Narthecium ossifragum* and various *Sphagnum* species.

5. Changes in overall vegetation/habitat cover

Although it has only been less than a year since tree felling has been carried out at this site it can already be seen that blanket bog vegetation is beginning to recover. At present this mainly consists of the increased growth of *Molinia caerulea* with *Calluna vulgaris* also locally frequent. The future monitoring of the permanent quadrats established will reveal more information with regard to the recovery of blanket bog vegetation. At this site it will be interesting to observe if and when plant species typical of intact, wet blanket bog conditions, e.g. *Schoenus nigricans* and *Rhynchospora alba*, recolonize.

6. Monitoring quadrats

In the following pages the baseline vegetation composition of restored areas is presented by means of observed changes in permanent quadrats. A total of 6 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 the quadrats the corners have been marked with 1 metre tall sticks and a 10-figure GPS location for the quadrats was also recorded. 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

Restoration work has being taking place at this site for less than 1.5 years therefore no repeat monitoring has taken place.



Permanent quadrat 1 – August 2007

Site - Cappaghoosh			
Code - PQ1			
GPS – L 88775 42655			
Size (m) – 7 x 7			
Slope (Degrees) – 0			
Vegetation cover (%)	90		
Needle litter cover (%)	30		
Brash cover (%)	5		
Dwarf shrub cover (%)	10		
Herb cover (%)	70		
Bryophyte cover (%)	80		
No of species present	19		
Date of survey	24/8/07		
<i>Molinia caerulea</i>	6	<i>Racomitrium lanuginosum</i>	2
<i>Hypnum cupressiforme</i>	6	<i>Sphagnum papillosum</i>	2
<i>Sphagnum capillifolium</i>	5	<i>Sphagnum cuspidatum</i>	2
<i>Cladonia portentosa</i>	4	<i>Racomitrium lanuginosum</i>	2
<i>Calluna vulgaris</i>	4	<i>Aulocomium palustris</i>	1
<i>Epilobium vaginatum</i>	3	<i>Drosera rotundifolia</i>	1
<i>Polytrichum commune</i>	3	<i>Erica tetralix</i>	1
<i>Rhytidiadelphus squarrosus</i>	2	<i>Picea sitchensis</i> (seedlings)	1
Liverwort species	2	<i>Plagiothecium undulatum</i>	1
<i>Potentilla erecta</i>	2	<i>Thuidium tamariscinum</i>	1
Comments – Sitka spruce plantation planted in the late 1980's and felled to waste during 2007.			



Permanent quadrat 2 – August 2007

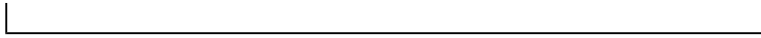
Site - Cappaghoosh	
Code – PQ2	
GPS – L 88790 42609	
Size (m) – 7 x 7	
Slope (Degrees) – 0-3	
Vegetation cover (%)	95
Needle litter cover (%)	5
Brash cover (%)	10
Dwarf shrub cover (%)	35
Herb cover (%)	70
Bryophyte cover (%)	70
No of species present	14
Date of survey	24/8/07
<i>Molinia caerulea</i>	6
<i>Hypnum cupressiforme</i>	5
<i>Calluna vulgaris</i>	5
<i>Cladonia portentosa</i>	4
<i>Sphagnum capillifolium</i>	4
<i>Erica tetralix</i>	3
<i>Sphagnum palustre</i>	3
<i>Aulacomium palustris</i>	2
<i>Polytrichum commune</i>	2
<i>Potentilla erecta</i>	2
<i>Rhytidiadelphus loreus</i>	2
<i>Vaccinium myrtillus</i>	2
<i>Hylocomium splendens</i>	1
<i>Picea sitchensis</i> (saplings)	1
Comments – Sitka spruce plantation planted in the late 1980's and felled to waste during 2007.	





Permanent quadrat 3 – August 2007

Site - Cappaghoosh	
Code – PQ3	
GPS – L 88877 42429	
Size (m) – 7 x 7	
Slope (Degrees) – 0-5	
Vegetation cover (%)	85
Needle litter cover (%)	5
Brash cover (%)	25
Dwarf shrub cover (%)	20
Herb cover (%)	75
Bryophyte cover (%)	60
No of species present	13
Date of survey	24/8/07
<i>Molinia caerulea</i>	6
<i>Hypnum cupressiforme</i>	5
<i>Sphagnum capillifolium</i>	4
<i>Calluna vulgaris</i>	4
<i>Erica tetralix</i>	3
<i>Leucobryum glaucum</i>	3
<i>Sphagnum papillosum</i>	3
<i>Eriophorum vaginatum</i>	2
<i>Potentilla erecta</i>	2
<i>Sphagnum tenellum</i>	2
<i>Dryopteris dilatata</i>	1
<i>Sorbus aucuparia</i> (saplings)	1
<i>Campylopus introflexus</i>	1
Comments – Sitka spruce plantation planted in the late 1980's and felled to waste during 2007.	





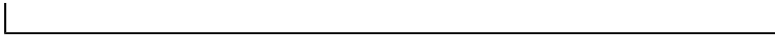
Permanent quadrat 4 – August 2007

Site - Cappaghoosh			
Code – PQ4			
GPS – L 88630 42400			
Size (m) – 7 x 7			
Slope (Degrees) – 0-5			
Vegetation cover (%)	90		
Needle litter cover (%)	5		
Brash cover (%)	20		
Dwarf shrub cover (%)	5		
Herb cover (%)	50		
Bryophyte cover (%)	80		
No of species present	17		
Date of survey	24/8/07		
<i>Sphagnum capillifolium</i>	6	<i>Dryopteris dilatata</i>	1
<i>Molinia caerulea</i>	5	<i>Erica tetralix</i>	1
<i>Hypnum cupressiforme</i>	4	<i>Pleurozium schreberi</i>	1
<i>Rhytidiadelphus loreus</i>	4	<i>Blechnum spicant</i>	1
<i>Calluna vulgaris</i>	3	<i>Salix aurita</i>	1
<i>Potentilla erecta</i>	2	<i>Dicranum scoparium</i>	1
<i>Aulacomium palustris</i>	2	<i>Polytrichum commune</i>	1
<i>Sphagnum palustre</i>	2	<i>Dryopteris dilatata</i>	1
<i>Polytrichum commune</i>	1		
Comments – Sitka spruce plantation planted in the late 1980's and felled to waste during 2007.			



Permanent quadrat 5 – August 2007

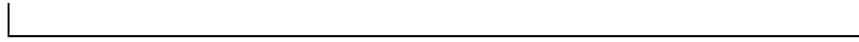
Site - Cappaghoosh	
Code – PQ5	
GPS – L 89008 42273	
Size (m) – 7 x 7	
Slope (Degrees) – 0-3	
Vegetation cover (%)	100
Needle litter cover (%)	0
Brash cover (%)	30
Dwarf shrub cover (%)	30
Herb cover (%)	75
Bryophyte cover (%)	75
No of species present	14
Date of survey	24/8/07
<i>Molinia caerulea</i>	6
<i>Hypnum cupressiforme</i>	5
<i>Sphagnum capillifolium</i>	5
<i>Calluna vulgaris</i>	5
<i>Rhytidiadelphus loreus</i>	3
<i>Sphagnum papillosum</i>	3
<i>Erica tetralix</i>	2
<i>Hylocomium splendens</i>	2
<i>Polytrichum commune</i>	2
<i>Potentilla erecta</i>	2
<i>Vaccinium myrtillus</i>	2
<i>Drosera rotundifolia</i>	1
<i>Dryopteris dilatata</i>	1
<i>Racomitrium lanuginosum</i>	1
Comments – Sitka spruce plantation planted in the late 1980's and felled to waste during 2007.	





Permanent quadrat 6– August 2007

Site - Cappaghoosh	
Code – PQ6	
GPS – L 8914742237	
Size (m) – 7 x 7	
Slope (Degrees) – 0-3	
Vegetation cover (%)	95
Needle litter cover (%)	0
Brash cover (%)	30
Dwarf shrub cover (%)	20
Herb cover (%)	80
Bryophyte cover (%)	75
No of species present	13
Date of survey	24/8/07
<i>Molinia caerulea</i>	7
<i>Sphagnum capillifolium</i>	6
<i>Hypnum cupressiforme</i>	5
<i>Calluna vulgaris</i>	4
<i>Rhytidiadelphus loreus</i>	4
<i>Erica tetralix</i>	3
<i>Breutelia chrysocoma</i>	2
<i>Polytrichum commune</i>	2
<i>Campylopus atrovirens</i>	1
<i>Potentilla erecta</i>	1
<i>Aulacomium palustris</i>	1
<i>Phragmites australis</i>	1
<i>Vaccinium myrtillus</i>	1
Comments – Sitka spruce plantation planted in the late 1980's and felled to waste during 2007.	



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