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Bringing the bogs back to LIFE

A major blanket bog restoration project in western Ireland

funded by LIFE - Nature and Coillte

July 2002 to December 2007

PROJECT RESULTS BOOKLET

Life

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Conifers in a blanket bog landscape

Background to the Irish Blanket Bog Restoration Project

As a result of the prevailing cool and wet climate the west of Ireland supports some of the best examples of blanket bog landscapes in the world. The widespread development of blanket bogs in Ireland began between five and seven thousand years ago and it is estimated that intact blanket bog once covered at least 773,000 hectares. In recent centuries there has been an accelerated level of blanket bog exploitation. The main causes of this habitat loss have been peat-cutting for fuel, afforestation, agricultural reclamation and overgrazing by sheep.

In the west of Ireland the widespread planting of coniferous tree species on blanket bog began during the 1960's. The main tree species planted were the North American species lodgepole pine (*Pinus contorta*) and Sitka spruce (*Picea sitchensis*). In order to make tree growth possible large areas of blanket bog were drained. The subsequent growth of extensive blocks of conifers has led to the direct loss of habitat and the fragmentation of the remaining open blanket bog landscape.

In 2002 a major blanket bog restoration project commenced on land owned by Coillte, which is the largest commercial forestry company in Ireland. The main objective of this project was to restore 1212 hectares of blanket bog, much of which was damaged, to varying degrees, by afforestation. Another important goal of the project was to trial a range of bog restoration techniques which may be used in restoration programmes in the future. Seventy five percent of the €4.19 million project cost has been provided by the European Commission LIFE-Nature fund with the remainder provided by Coillte.

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The importance of Irish blanket bogs

In a worldwide context, blanket bog habitat is a very scarce resource. The habitat is restricted to a relatively small number of locations throughout the world which have a cool, moist climate, e.g. Ireland, north-west Britain, western Norway, New Zealand and Newfoundland.

The blanket bogs of Ireland are important for a wide variety of reasons including carbon storage, water supply and biodiversity. The habitat supports a surprisingly diverse range of plant and animal species which are specially adapted to the existing wet and nutrient-poor conditions. In western Ireland the vegetation of lowland blanket bogs tends to be dominated by purple moor grass (*Molinia caerulea*), black bog rush (S*choenus nigricans*) and cross-leaved heath (*Erica tetralix*) while in mountainous areas of the country plant species such as ling heather (*Calluna vulgaris*), hare's tail cottongrass (*Eriophorum vaginatum*), common cottongrass (*Eriophorum angustifolium*) dominate the blanket bog vegetation.

In addition to these common blanket bog species the habitat also supports a number of plant and animal species that are considered to be rare in a European context. Examples of rare plant species found in blanket bogs include the marsh saxifrage (*Saxifraga hirculus*), shining sicklemoss (*Drepanocladus vernicosus*) and slender cottongrass (*Eriophorum gracile*). Blanket bogs also provide habitat for rare birds of prey such as the hen harrier (*Circus cyaneus*) and merlin (*Falco columbarius*).

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The project sites

Coillte was established in 1989 to manage publicly owned commercial forests. In the context of its Nature Conservation Programme the company embarked on this major blanket bog restoration project on selected Coillte-owned afforested sites, with the support of funding from the EU LIFE-Nature Programme.

In the original project application blanket bog restoration was carried out at a total of 14 sites which vary between 12 and 344 hectares in size. Most of the sites are situated along the western seaboard of Ireland with Co. Mayo containing the largest number. These sites were selected for the project because they lie within, or adjoin, Natura 2000 sites which have been designated because of the high quality blanket bog habitat that they support.

Most of the sites are dominated by afforested blanket bog however some sites such as Owenanirragh and the Slieve Blooms, also contain significant areas of open, largely intact, blanket bog.

Map of project sites. X = Demonstration Sites

Site No.	Site name	Area (ha)
2	Garrane	17.9
3	Drumalonhurt	102.0
4	Pollagoona	16.2
5	Emlaghdauroe	90.3
6	Bellaveeny	344.3
7	Eskeragh A	12.3
8	Eskeragh B	28.3
9	Owenanirragh	166.0
10	Glencullin Lower	28.6
11	Shanvolahan	76.6
13	Croaghonagh	33.0
14	Carrick Barr	22.2
15	Sessueguilroy	23.6
16	Slieve Bloom Mtns	252.0


Pollagoona


Emlaghdauroe


Croaghonagh

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Field meeting at Croaghonagh

Planning for the project

At the outset of the project a number of visits were made by project staff to similar blanket bog restoration sites in the United Kingdom. The visits proved to be invaluable as they highlighted, at an early stage, the advantages and disadvantages of various restoration techniques used.

Prior to commencing restoration activities at the sites a series of field meetings were held with local Coillte staff and a number of national statutory bodies including the Forest Service, the National Parks and Wildlife Service and the Fisheries Board. At these meetings the restoration work to be undertaken was outlined and discussed.

The restoration work undertaken in the project was discussed and overseen by a Project Management Group which included a representative of the National Parks and Wildlife Service and a project ecologist. Every year a meeting of a Project Advisory Panel took place where participants, drawn from a wide range of interested organizations, were invited to contribute their views to the Project Management Team. These various meetings have been beneficial and have resulted in improvements to the overall running of the project.

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Restoration methods

Drain blocking at Croaghonagh

The main restoration work carried out at sites was the felling of conifers and the blocking of drains. At most sites the young/low yielding conifer crop was felled manually by chainsaw and left on site while at three sites (Emlaghdauroe, Shanvolahan and Sessueguilroy) a mature conifer crop was felled by machine and removed. The chipping of felled trees was also carried out at two sites (Eskeragh and Emlaghdauroe).

At many of the sites where the trees were felled manually and left on site the fallen trees were placed into rows with an excavator in order to partially clear the bog surface of woody material. In addition to allowing the more rapid recovery of bog vegetation this partial clearance of the bog surface has made follow-up operations such as drain-blocking and the removal of regenerating conifers/broadleaves possible.

The bog drains were mainly blocked with plastic dams which were inserted manually, while at a small number of sites the blocking of drains was carried out with an excavator. In order to prevent the regrowth of unwanted tree/shrub species, such as lodgepole pine and downy birch, a programme of regeneration clearance was carried out at all sites. At a number of sites new fencing was erected, or the existing fences were repaired, in order to exclude grazing animals (mostly sheep) which could have slowed down the restoration process.

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Main results

Within the original project area a total of 490 hectares of conifer plantation has been felled and bog drains over approximately 700 hectares of land have been blocked. At sites where the conifer crop was relatively young, and the trees had not closed canopy, the recovery of vegetation has been rapid with a high cover of purple moor-grass (*Molinia caerulea*) evident at many sites within 3 years of tree felling. At most sites the blocked drains have also become quickly dominated by luxuriant carpets of Sphagnum moss. At present the vegetation of these recovering sites is quite species-poor however it is anticipated that plant species typical of wetter conditions will recolonize as the water levels in the bog recover over time.

At sites where a crop of taller, more mature trees was removed the rate of bog vegetation recovery has been much slower due to the loss of the native bog vegetation by drainage and shading effects. At these sites, where more drying-out of the peat soil has taken place, there has been a greater degree of establishment by undesirable plant species such as soft rush (*Juncus effusus*) and downy birch (*Betula pubescens*). These sites will clearly require more attention in the years to come and a plan is being drawn up for the management of these sites following the end of this Life project.

Wind-rowed conifers and recovering bog at Bellaveeny

Sphagnum moss recolonizing a wet drain

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Student group at Slieve Blooms boardwalk

Project communication

One of the most important aspects of this project has been its communication to a wider audience. This has been achieved by a variety of means including the production and circulation of project information leaflets, the publishing of newspaper and magazine articles, the staging of information days for various interested parties and the establishment of a project website. Various articles outlining aspects of the restoration work have been published in local and national newspapers such as the Mayo News and The Irish Times.

One of the communication highlights was the official launch of the project in June of 2004 which was given extensive national media coverage, including a slot on the main national television station (RTE) news bulletins. The project has also had information stands at a range of popular national outdoor events such as the National Ploughing Championships and the Clare Biodiversity Day.

In addition to the communication of the project through the media five of the project sites have been designated as demonstration sites where boardwalks have been constructed and information boards have been erected. These demonstration sites have been used frequently over the past couple of years to host field visits from a variety of groups and organisations from within Ireland and abroad. Groups from An Taisce, The Society of Irish Foresters and The Department of Environmental Resource Management, University College Dublin, visited some of the demonstration sites as did international groups from the Life Aapa Mires Project, Finland, Scottish Life Peatlands Project Team, and the Life Border Mires Team from Northumberland, UK.

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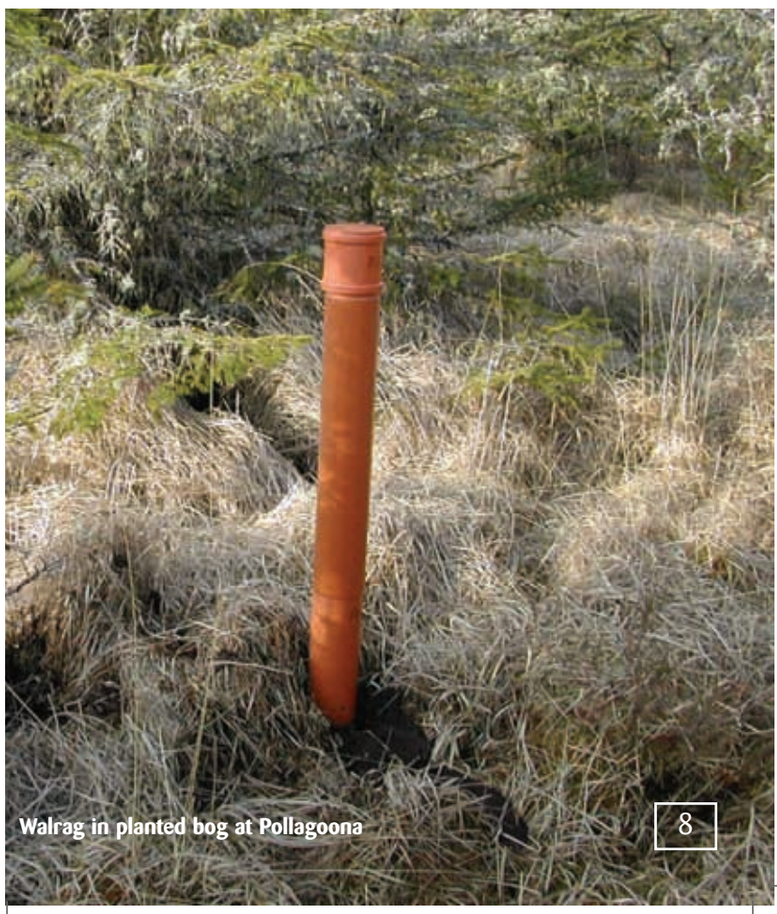
Monitoring of the project

Examining a water autosampler at Drumalonhurt

Monitoring the effects of the various restoration measures is a very important part of the project and this has been done in a number of ways. Throughout the project the water quality in bog streams at three sites has been monitored before, during and after restoration activities. Water levels within the peat have been monitored using Walrags (WAter Level RAnge GaugeS) in order to assess the degree of hydrological recovery of the peat soils following restoration.

The recovery of blanket bog vegetation has also been documented and assessed throughout the lifetime of the project. This is being achieved by documenting the changes in plant species composition and cover in permanent quadrats over time. A photographic record of these quadrats is also being kept. At present purple moor-grass is the main recolonizing plant species however the monitoring of vegetation into the future will reveal when other bog species indicative of wetter, more nutrient-poor, habitat conditions recolonize.



Walrag in planted bog at Pollagoona

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Project extension

Aerial photograph of Derry extension site prior to restoration

As a result of savings made within the project, funds were re-directed towards the restoration of up to 776 additional hectares of blanket bog at six sites throughout the west of Ireland. These sites include both completely new sites and extension areas to sites that were in the original project application. These sites adjoin important blanket bog SACs and will be incorporated into the SAC areas following the completion of restoration work. Restoration work at these sites mainly involves the felling to waste of young/low-yielding conifers and the blocking of drains. At a number of sites, areas which previously supported a conifer crop of commercial size are also being restored to blanket bog. This work began in autumn of 2006 and will be completed by December 2007.

Bog pools and stunted conifers within Derry extension site

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Wider benefits

In addition to improving both the quality and quantity of blanket bog habitat within a number of important Irish Natura 2000 sites this project has also provided important insights into blanket bog restoration in Ireland. Prior to the onset of this work there was very little available information regarding the large-scale restoration of blanket bog systems in Ireland. In particular, there was little knowledge of the operation and cost of blanket bog restoration activities and this project has gone some way to correcting this knowledge deficit.

In addition to the direct ecological benefits of blanket bog restoration the permanent removal of the conifer crop at a number of sites, e.g. Emlaghdauroe, has resulted in a dramatic positive benefit in terms of the visual appearance of the landscape.

In the future it is anticipated that bog restoration will be the preferred management option for significant areas of conifer plantation on blanket peat in the west of Ireland. This project has demonstrated that, given adequate funding, large areas of the habitat can be restored. Observations made during this project have also provided important advice regarding restoration techniques to a number of important projects such as the Life funded Irish Raised Bog Restoration Project and the Western Peatlands Project.

Emlaghdauroe prior to tree removal

Emlaghdauroe three years after tree removal

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CONTACTS FOR FURTHER INFORMATION

Contact Address:

COILLTE
The Irish Forestry Board,
Newtownmountkennedy,
Co. Wicklow,
Ireland.

Telephone: +00 353 1 2011111
Fax: +00 353 1 2011199
E-mail: pr@coillte.ie

Website: www.coillte.ie
www.irishbogrestorationproject.ie

EC LIFE UNIT,
Environment Directorate-General,
European Commission,
DG ENV.E.4 BU-9 02/1,
B-1049 Brussels,
Belgium.

Telephone: + 32 2 2921787
Fax: + 32 2 2969556
Website: www.ec.europa.euenvironment/life

Coillte is pleased to acknowledge the generous funding received from the EU LIFE Programme towards the implementation of this project. We also wish to thank the Forest Service, the National Parks and Wildlife Service and the Irish Peatland Conservation Council, as well as all other organizations and individuals who have participated in the project and contributed to its success.

Project Reference: LIFE02NAT/IRL/8490

Text by John Conaghan with contributions by Kevin Donnellan, Caroline White and Philip Murphy.
Photographs by John Conaghan apart from page 7 (Kevin Donnellan) and pages 8 & 9 (Neil Warner)