# Society of Irish Foresters Study Tour (Ireland) 2004 Galway/Mayo 11-12 June

The year 2004 marked the centenary of state forestry in Ireland. To mark the occasion the Society held a Study Tour in the Galway/Mayo area, where state forestry was very active in the 1950s and 60s. The tour was based at the Atlantic Coast Hotel in Westport.

## Day 1 Friday 11 June 2004

*Coillte EU LIFE project at Eskeragh bog*

On Friday morning, the 11 June, the group headed north to Eskeragh bog, located west of Crossmolina. Tour Leader, Tony Mannion, welcomed everyone, and opened by giving gave a brief history of forestry in Ireland over the 100 years since 1904, with an emphasis on Co Mayo. He stated that the wheel had come a full circle, from the extensive planting on peats in the 1950s to the peatland restoration work currently being carried out at Eskeragh. In the 1950s the area was used for rough grazing and forestry; today it is seen as a site of international ecological importance.

Frank Nugent, Forest Manager Coillte, welcomed the group to the North Mayo Forest Management Unit (FMU). It is 25,000 ha in extent, 19,000 ha of which is planted. The main species is lodgepole pine, the highest percentage in any FMU. Very little native woodland is found in the general area. The surroundings have the lowest population density of any area in the country.

Kevin Donnellan, Coillte, Project Manager for the EU LIFE Blanket Bog restoration project introduced the team working on the Eskeragh Bog complex. Caroline White, who is responsible for project administration and public relations, outlined the size and scale of the project. The total budget is €4.2 million, funded jointly by Coillte and DG Environment. The project focuses on the restoration of 1,200 ha of blanket bog at 14 sites in counties Clare, Donegal, Galway, Kerry, Mayo, Offaly and Sligo. Five of the sites, including Eskeragh, are demonstration areas. These are designed to enable people to understand the concepts involved in restoration. Notice boards and boardwalks will be provided to explain the work that is taking place. A car park has been provided at Eskeragh to facilitate visitors to the site and the associated boardwalk.

Kevin Donnellan outlined the main work that will be carried out:

- fencing to keep out grazing animals,
- removal of planted trees,
- blocking of drains and
- monitoring of the water table.

Dr John Conaghan, Project Ecologist, outlined the importance of conserving blanket peatlands. While in Ireland we think of peatland as an extensive resource, in fact in international terms it is very limited in extent. Furthermore, blanket bogs found abroad are not the same as those found in Ireland, so it is imperative that we conserve a portion of this unique landscape.

The peatlands of the west of Ireland are among the most important intact areas of active blanket bog found in Europe. However, it is estimated that only 20% of blanket

bogs in Ireland are intact, while some 30% are cutaway and severe erosion caused by overgrazing has caused significant damage. Mayo has 30% of all the intact blanket bog in Ireland. Since 1997, 135,139 ha of active blanket bog have been proposed as candidate Special Areas of Conservation (SACs) under the EC Habitats Directive. Proposed blanket bog SACs are located mainly in the Atlantic Seaboard counties, especially Co Mayo.

In the project, special emphasis will be placed on sites in the Coillte North Mayo Forest Management Unit (FMU), where the full range of blanket bog types occurs, from lowland to mountain blanket bog (encompassing sensitive river catchments). In other FMUs, the sites are representative of afforested peatlands around the country.

In the past, blanket peatlands were extensively afforested, with unfenced open areas often heavily overgrazed. This has resulted in degradation and drying out of the habitat. These threats are the focus of this project.

The problems being addressed are:

- overgrazing of open bog,
- drying out of the open bog by forestry drains lowering natural water-table levels,
- reduction of the area of blanket bog by afforestation,
- regeneration of forest plantations on adjoining open bog SACs.

The project will reverse these processes and over time will create an area of active blanket bog by:

- fencing to control grazing on 719 ha of open bog,
- drain blocking to restore the integrity of the bog hydrological systems,
- restoration of some 494 ha to enlarge the blanket bog area,
- removal of naturally regenerated trees from the open bogs.

Restoration techniques for afforested peatland, pioneered in a similar LIFE project in the UK (*The Border Mires Active Blanket Bog Rehabilitation Project*) will be further developed in the project. Links with other LIFE-funded projects that have an emphasis on tree clearance have also been made. The project will build on conservation management plans for the sites developed by Dúchas (now the National Parks & Wildlife Service), which was previously supported by EU LIFE funding. At the end of the project a significant amount of blanket bog restoration will have occurred, which will serve as a to demonstrate it as a management option on afforested peatlands.

Kevin Donnellan outlined the Eskeragh site, which is located just south of the main Ballina to Belmullet road, 10 km west of Crossmolina, Co Mayo. The site encompasses two separate afforested areas, comprising areas of 12.3 and 28.3 ha. They lie within the extensive Bellacorick Bog Complex Special Area of Conservation, one of the finest examples of a relatively intact lowland blanket bog landscape in Ireland. The SAC is notable for the widespread occurrence of flush and fen vegetation, derived from mineral-rich and often calcareous groundwater seepage areas. These are some of the best alkaline fens in the country, notable for their diversity of structure and species, especially the rare boreal relict fen mosses, such as *Leiocolea rutheana. Homalothecium nitens* and *Paludella squarrosa* are also found on the site.

The majority of the site was planted in 1983 with lodgepole pine, which grew well, and Sitka spruce, which grew poorly.

Peat develops only when the soil water-table is high, when it is lowered the vegetation changes. The presence of ling heather indicates that the site has dried out to some extent. However, throughout most of the afforested areas trees have grown poorly in places and, as a result, the bog vegetation is still present; many drains are already infilling with a luxuriant growth of Sphagnum moss. Overall a relatively well-developed bog/heath flora has remained comprising *Molinia caerulea, Calluna vulgaris, Eriophorum vaginatum* and *Myrica gale.* Mosses such as *Hypnum cupressiforme, Sphagnum capillifolium* and *Rhytidiadelphus loreus* are also frequent. It is expected that peatland regeneration will be rapid.

The Owenboy Nature Reserve lies to the south of the larger forestry site at Eskeragh. The plantation on this site has been felled by chainsaw. About 5 ha of felled trees have been chipped by machine to clear the bog surface. On the remaining areas an excavator has gathered the trees into windrows in order to maximise the area of bare ground for peatland regeneration. Drains in have been blocked by plastic dams in about one third of the recently felled areas. Further restoration work is planned and drains in the remainder of the site will be dammed.

Eleven water-table depth measuring devices - Walrags - have been installed. Five permanent vegetation-sampling points have also been set up to monitor vegetation recovery.

### *Forestry and fish in the Burrishoole catchment*

Following lunch we headed to Nephin Beg Forest where we were first met by Tony O'Keeffe, formerly of Coillte and now a Consultant Forester, who outlined the difficulties of forest management in a sensitive catchment. In the 1990s there was extensive clearfelling in the catchment. However, a good partnership developed between the fisheries interests at the Salmon Research Agency (now the Marine Institute) at Burrishoole, Newport, and Coillte. He outlined the characteristics of the catchment:

- steep slopes,
- high rainfall (>2,500 mm per annum),
- very thin layer of peat over mineral soil,
- forest cover mainly Lulu Island lodgepole pine.

The change from chainsaw felling to harvesters posed new challenges for forwarders as the brash was unevenly spread: they had great difficulty climbing the steep slopes, and as a result rutted the soil along the extraction racks, which developed into watercourses. This alarming development necessitated consultation with the Marine Institute.

The solutions tested were as follows:

- silt traps were installed - a new development and
- harvesting was confined to the period from the beginning of May to the end of October.

Kieran Mc Loughlin, the Harvesting Manger with Coillte outlined the current harvesting situation in the catchment. The catchment comprises some 12,500 ha of which Coillte owns 30%. Over the next six years 133,000 $m^3$ will be removed by clearfelling. The major challenges remain steep slopes, low yield class pine and high rainfall. However, harvesting machines have become more environmentally friendly;

forwarders now have twin wheels. The management of timber sales has also been modified, with less concentration on one area. In areas with very severe slopes cable extraction is being used, and areas of low productivity (yield class 14 and lower) are no longer felled. A discussion took place on the size of individual clearfelling areas, with agreement that an area of 25 ha was the most suitable.

Reforestation also poses difficulties, particularly with cultivation. Solutions, again developed following consultation, include:

- silt traps should be in position prior to any cultivation,
- mounding will be used for cultivation,
- water quality is continuously monitored

Brendan O'Hea from the Marine Institute praised Coillte for the cooperation received in dealing with the water quality issues arising from clearfelling; both sides had learnt a lot during the consultative process. He pointed out that at the reforestation phase long down slope drains were a problem, as the velocity of the water increased and silt was deposited in the main watercourses. Drains should be short, leading to a silt trap. The lessons learned were that planning and consultation on all felling and reforestation operations, involving all interested parties, was essential.

At the Marine Institute research building Brendan O'Hea gave a presentation on the Burrishoole catchment and work being carried out at the Newport Research Facility. The catchment is situated 9 km northwest of Newport, off the Newport to Mulrany/Achill Road, to the north east of Clew Bay, and lies in the heart of the Nephin Beg mountain range. It has a total area of 8,949 ha, with the main land uses being agriculture and forestry. The catchment contains three large loughs, Furnace, Feeagh and Bunaveela and is drained by 45 km of shallow streams. The Burrishoole Fishery, a world-renowned amenity, is primarily based on the two lower loughs, Feeagh and Furnace. Ownership of the fishery and lower catchment transferred to the state with the formation of the Salmon Research Agency in 1990. The agency was amalgamated with the Marine Institute in 1999.

The facilities comprise a laboratory and administration block, freshwater hatchery and fish-rearing facilities, fish census trapping stations, a salmonid angling fishery and a comprehensively monitored freshwater lake and river catchment. A wide range of the institute's freshwater and inshore fisheries programmes, including work related to eels, sea trout, and salmon are hosted at the site. National and international co-operative research and development programmes on aquaculture, inshore fisheries, and environmental issues are also conducted at the facility. It forms one of the greatest natural laboratories for studying Atlantic salmon in Europe and is a prime location for integrated freshwater and marine research. It is also within easy reach of Clew Bay and Connemara, where a large part of the Irish salmon farming industry is located.

## Day 2 Saturday 12 June 2004

The group left the Atlantic Coast Hotel and headed south through Connemara to our first stop at Cloosh Valley.

*Coillte forest management policy and practice on peatlands*

The Coillte District Manager, Myles Mac Donncadha, welcomed us. Cloosh Valley has an overall area of 6,500 ha. Currently, 85% of the catchment is planted, mainly with a 50:50 mixture of lodgepole pine and Sitka spruce. The average growth rate of the pine is better than the national average (yield class 12 v 10 for the national average). Sitka spruce productivity is, however, lower than the national average (yield class 13 V 17 for the national average).

Dr Dermot Tiernan, Coillte, gave a presentation on how to optimise the productive potential of low production forests.

Social forestry was important in 1960s - 19880s when Cloosh Valley and many other forests in the west of Ireland were established. At that time peatland was regarded as wasteland but today their ecological importance and value is recognised.

Coillte Red Areas (designated as uneconomic tree crops growing on poor soil) comprise 10% (43,500 ha) of the Coillte estate nationally, with some 8% (34,800 ha) on the western seaboard. Mayo and Connemara hold 15,000 ha of Red Areas. Under the current legislation, the 1946 Forestry Act, reforestation following felling is legally binding. Research examining management options on Red Areas is currently underway, part-funded by COFORD.

The main forest management challenges facing Coillte today can be termed the Big Five:

1. water quality – siltation, nutrient enrichment, bank erosion and acidification,
2. biodiversity – perceived reduction from afforestation
3. peatland – loss of the resource, 94% of raised and 86% of blanket bog damaged/destroyed (Heritage Council 1992)
4. landscape – landscape design not taken seriously in Ireland,
5. social issues – viewed more as a hindrance than an opportunity to engage with communities.

Operational methods to meet the challenges (in brackets) include:

1. planting without cultivation (water quality),
2. natural regeneration (water quality and biodiversity),
3. environmental planting (water quality, biodiversity, landscape and social),
4. bog restoration (biodiversity, peatland, landscape and social),
5. buffer zone management (water quality, biodiversity, landscape and social),
6. restructuring of forest age profile (biodiversity and landscape),
7. visual redesign (landscape and social),
8. long-term-retention of stands (biodiversity, landscape and social),
9. extend rotation to age of maximum mean annual increment (biodiversity, landscape and social).

Management options for low productivity forests are:

1. optimise the productive potential,
2. designate for environmental management,
3. fell with no reforestation.

1. Optimise the productive potential
   Financial analysis (using Coillte investment appraisal package ForFin) under current economic conditions indicates:
   - the threshold yield class will depend on the prevailing economic conditions of the day,
   - the threshold yield class is currently 14 $m^3$ $ha^{-1}$ $yr^{-1}$,
   - discounted revenue from timber sales is sensitive to yield class,
   - all crops with a yield class of 14 or more with normal inputs are economic,
   - yield classes 10 and 12 can also be economic with reduced inputs,
   - revenue from timber sales is more sensitive to changes in yield class below 10,
   - reforesting areas with a yield class below 10 is currently not economically justified.

   In summary, the site productivity basis for operational decisions are:
   - yield class $\geq$ 14, normal inputs, conventional forestry,
   - yield class 10–12, reduced inputs, no cultivation/natural regeneration,
   - yield class < 10, minimal inputs: designate for environmental management.

2. Designate for environmental management
   All sites with a yield class less than 10 are evaluated for their suitability to be designated for environmental management. If there is a net environmental gain then minimal inputs can be justified.

3. Fell with no reforestation
   The majority of low production forests occur within sensitive environmental catchments. Actions that require minimal inputs include felling with no reforestation of the site. The current situation regarding reforestation is:
   - the reforestation obligation is being considered by the Forest Service as part of the Red Areas project and the Bacon review;
   - 43,500 ha of low production forests would not be grant-aided today;
   - there is provisional agreement that 13,000 ha (1/3rd of the low production forests) should not be reforested (generally the 'poorest of the poor', in sensitive catchments);
   - there is a debate about maintaining carbon stocks in forests on blanket peat v their low productivity and environmental benefits of blanket peat restoration.

Forest Management Plans

- The agreed framework for the management of all forests, including low productivity areas, are Forest Management Plans (FMPs).
- It is Coillte policy to develop FMPs nationally.
- FMPs will increase operational efficiency by integrating day-to-day business management activities with the long-term management objectives for the forest.
- A comprehensive FMP will capture all the economic, environmental and

social functions of the forest.
- FMPs will be the vehicle for future strategic and operational planning.
- FMPs will be fully integrated with the Coillte Integrated Planning (IP) system.

Sustainability is the key principle on which plans will be based as embodied in the Forest Service Code of Best Forest Practice and Guidelines and the Forestry Standards for Ireland (National and FSC).

Dr Tiernan then presented a Decision support System (DSS) for the assistance of forest planners (Appendix) in determining the most appropriate management prescriptions to apply in low production forests.

*Ecosystem monitoring and research on afforested blanket peatland*

Ecosystem monitoring under the EC Forest Focus Regulation and rainwater chemistry

Professor Ted Farrell, Forest Ecosystem Research Group (FERG), University College Dublin outlined the group's work on ecosystem monitoring and research at Cloosh Valley, which has been underway since 1991. The core work has been long-term ecosystem monitoring. This work has provided a basis for research projects and background information for other studies. The quantity and chemistry of water passing through forest ecosystems has been monitored, almost continuously, at the site since monitoring began. Two other sites have also been monitored by FERG over the same period: Roundwood, Co Wicklow (as at Cloosh Valley in pure Sitka spruce) and in a semi-natural oakwood, at Brackloon, Co Mayo. The programme at the three sites forms part of Ireland's forest health and vitality monitoring under the EC Forrest Focus Regulation.

Water chemistry samples (throughfall, stemflow and at three soil depths) are collected at Cloosh Valley throughout the year. Rainwater is collected nearby the forest. Analysis of the samples provides information on the chemistry of the rainfall and how this interacts with the forest. Rainfall chemistry is dominated by sodium and chloride derived from sea salt. Although pollution levels are low, inputs of acidity in the rainfall can have an impact on surface waters in this acid-sensitive ecosystem.

Individual storm events have a very significant impact on rainfall chemistry in the west of Ireland. Large storms can result in very high deposition of sea salt: pulses of acidity in streams, following such events, have been reported in other studies.

Carbon sequestration in peatland forests

Dr Ken Byrne, formerly of FERG and now a post-doctoral researcher at the Centre for Hydrology, Micrometeorology & Climate Change at University College Cork outlined the carbon sequestration potential of peatland forests. The ability of forests to sequester atmospheric carbon dioxide ($CO_2$) is well known. As a result forests are recognised as having an important role in mitigating greenhouse gas emissions. Despite this the carbon balance in peatland forests remains poorly understood. Pristine peatlands sequester small amounts of $CO_2$ and release methane ($CH_4$). Drainage from forestry reduces or stops $CH_4$ emissions while soil $CO_2$ emissions are increased. If these emissions are offset by $CO_2$ sequestration by the forest crop there can be a net uptake of $CO_2$.

Forest management operations and streamwater chemistry

Tom Cummins, also formerly of FERG had researched the impact of management operations on streamwater quality. Catchment level is the most important landscape unit for water quality. Accordingly a large-scale experiment was run at Cloosh Valley during 1996-2000, using catchments at several scales up to 1 $km^2$ (100 ha). While streamwater quality was being continuously monitored, catchments were subjected to harvesting, reforestation and fertilisation.

Concentrations of some nutrients increased in streams following harvesting operations. However, these increases were not a problem for water quality, as the aquatic ecosystem productivity is limited by phosphorus, so only an increase in phosphorus can lead to eutrophication. Phosphorus fertilising was clearly associated with increased streamwater phosphorus. Surprisingly, forest harvesting (without subsequent fertilising) led to similar effect. Because the site is totally peat covered phosphorus in runoff is an ongoing hazard.

*Woodland Improvement Scheme at Brackloon Wood*

We passed through Connemara to Co Mayo, to arrive at Brackloon Wood. There we were met by Jerry Hawe, Sylviron Limited who is a consultant to Coillte, the owners of Brackloon Wood.

The project at Brackloon is funded under the Forest Service, Native Woodlands Scheme.

Although Brackloon is classified as semi-natural Atlantic oak woodland, some 50 of the total area of 74 ha were planted with conifers in the 1960s. During the 1990s, knowledge and understanding of the woodland, its functioning and importance increased (due mainly to the monitoring work carried out by FERG (see *Ecosystem monitoring and research on afforested blanket peatland*). As a result, from about 1995, Coillte began the removal of conifers.

In 1998, Sylviron drew up management guidelines for the wood and applied for Forest Service under the Woodland Improvement Scheme (WIS). *The Woodlands of Ireland* also supported the application, as it would act as a pilot project for the proposed Native Woodlands Scheme (launched by the Forest Service in early 2001). (The Woodlands of Ireland had been working with the Forest Service in drawing up guidelines for the new scheme.) Brackloon provided a testing ground for management operations typical of those that would be necessary in any woodland restoration project.

The objectives of the project are:

- to restore and conserve the semi-natural status of the entire woodland,
- to ensure the sustainability and longevity of the woodland, and
- to maximise its biodiversity.

Management operations were broken down into distinct phases. Stage one was to remove any remaining exotic species. These included conifers (other than Scots pine), sycamore, beech and, most importantly, rhododendron. The negative impact of rhododendron on biodiversity and woodland regeneration is well known. A cutting and control programme is in operation, with 20 ha having been cleared.

In addition to the removal of exotics, native species with poor form and those that are partially windthrown are being felled. Cut material is stacked to supplement the

deadwood habitat within the wood. Mature windthrown trees, for example large mature oaks, with extensive epiphyte communities are left untouched, as these are a normal part of semi-natural woodland, and have an essential role in the maintenance of biodiversity through the creation and maintenance of deadwood habitat. Livestock have been removed and excluded from the whole area using stock-proof fencing.

Having removed exotics the second phase involves establishment and regeneration operations. Where natural regeneration occurs, seedlings are being identified and marked and protected. In other areas enrichment planting is taking place, using native provenance material grown from seed collected in the wood, or from the neighbouring Eriff oakwoods. Enrichment planting is carried out in specific areas to fulfil specific objectives, including habitat integrity. For example, planting of oak seedlings in areas between outlying oak woodland blocks and the main oak woodland (an intact area of 11 ha) is designed to reconnect all areas of existing oak woodland to provide habitat connectivity, essential to the maintenance of biodiversity, as it facilitates the mobility of species dependent on oak.

Another objective of planting is the creation, and recreation, of specific woodland types, particularly those which are poorly represented. This involves planting, for example, ash and Scots pine in mixture with secondary species such as hazel, holly and rowan. This is essential to the maintenance of biodiversity in the securing of specific habitats and their related species.

The identification and appropriate management of wet woodland areas, riparian woodland areas, streams, water bodies, deadwood habitats is central to management operations. This involves adaptation of traditional forest management practices to promote biodiversity. For example, an area mounded prior to planting has had a silt trap installed on the mound drainage system before it outfalls to the Owenwee River, an important salmonid spawning watercourse. Rather than having a rectangular shape, the silt trap was installed as an irregularly shaped shallow pond, which promotes colonisation by aquatic species. In addition, it is located such that it has a spring-fed inflow to prevent stagnation.

The second phase to woodland regeneration/establishment involves identifying suitable areas suitable for regeneration, carrying out phase one operations, and in conjunction with ongoing rhododendron control allowing the climax forest to develop.

In adopting proactive and low intervention approaches to woodland regeneration, a minimum of two distinct age and size classes will be created and conserved, and therefore further promote the longevity and sustainability of the woodland.

Biodiversity, be it at the species, habitat or woodland structure levels, is central to all management operations. Diversity also extends to management regimes such as group regeneration, coppice-with-standards and low intervention. Adopting these distinct management regimes promotes the maximum biodiversity.

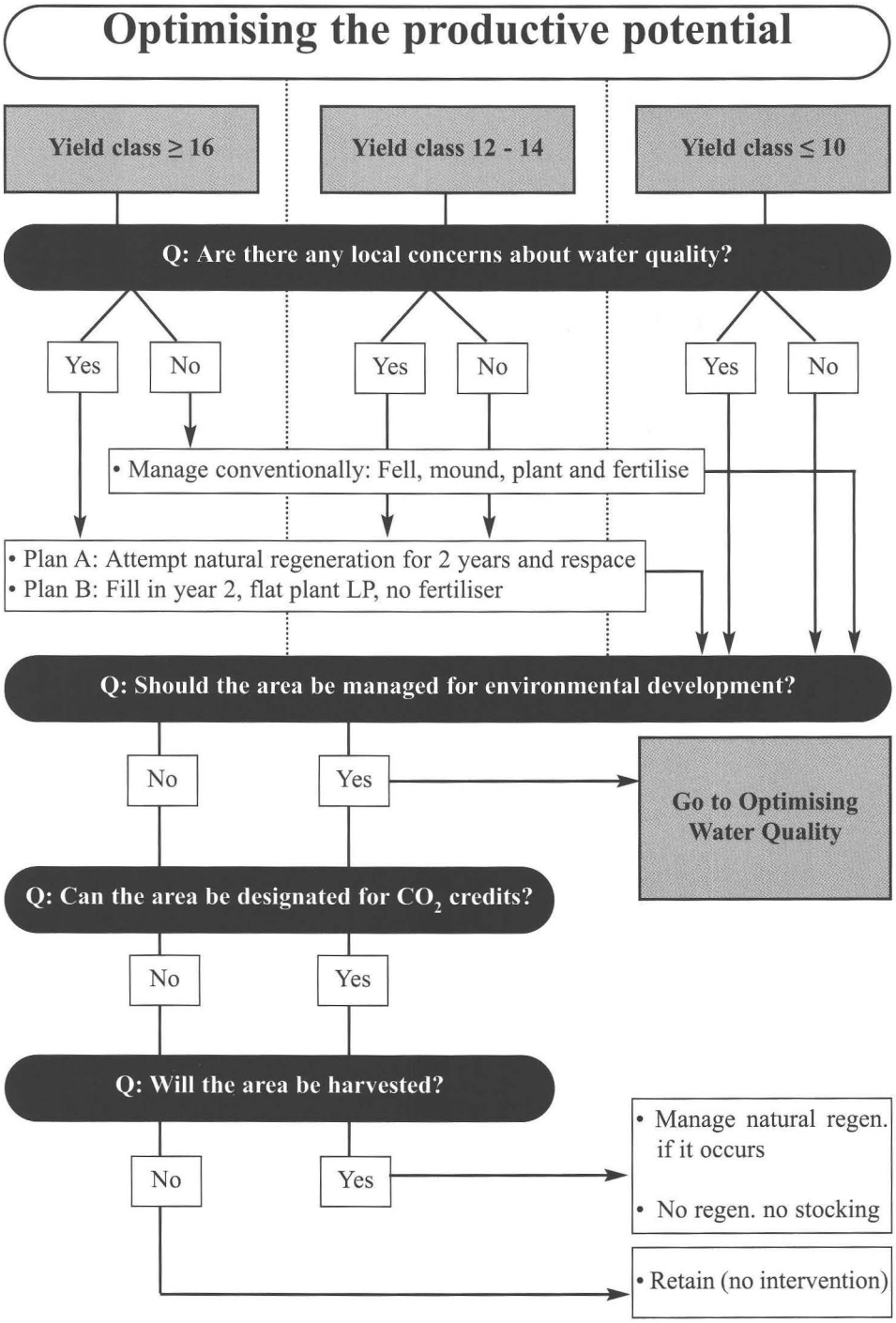
The first year of the five-year project has elapsed, with about half phase one works completed. The third to fifth years will be given over to maintenance operations. These are necessary to ensure the semi-natural status of the woodland and maintenance of biodiversity through the continued control of exotics. Coillte has expressed its commitment to the project, particularly in view of the ecological importance of the site.

Furthermore, the ecological, environmental, and amenity benefits of the project have been widely recognised.

## Attendance

Séamus Breslin, Tadhg Collins, Tomás de Gruineil, Joe Doyle, Orla Fahy, Pat Farragher, Joe Finlay, Jerry Fleming, Brigid Flynn, Matt Fogarty, Len Gallagher, John Griffin, Michael Hoban, Tom Kavanagh, Gerard Keane, Noel Kennedy, Vivian Kenny, John Higgins, Tony Mannion (Tour Leader), John Mc Loughlin (Tour Convenor), Gerard Moroney, Dan Murphy, Frank Nugent, Niall OCarroll, Brendan O'Neill, Eoghan O'Riordan, Tim Regan, Dermot Slevin and Trevor Wilson.

## Appendix


Optimising the productive potential
Yield class ≥ 16
Yield class 12 - 14
Yield class ≤ 10
Q: Are there any local concerns about water quality?
Yes
No
Yes
No
Yes
No
• Manage conventionally: Fell, mound, plant and fertilise
• Plan A: Attempt natural regeneration for 2 years and respace
• Plan B: Fill in year 2, flat plant LP, no fertiliser
Q: Should the area be managed for environmental development?
No
Yes
Go to Optimising Water Quality
Q: Can the area be designated for $CO_2$ credits?
No
Yes
Q: Will the area be harvested?
No
Yes
• Manage natural regen. if it occurs
• No regen. no stocking
• Retain (no intervention)

# Protecting Water Quality

**Q: Is the watercourse sensitive?**

Yes

No → Follow Forest Service Guidelines

| *Consultation Checklist* | |
|---|---|
| Consult for appropriate buffer width | *In m* |
| No planting in buffer zone? | *Y/N* |
| Targeted group planting in buffer zone? | *Y/N* |
| Dapple shade plant in riparian zone? | *Y/N* |
| Dams required slowing water? | *Y/N* |
| Low impact silviculture in adjoining lands? | *Y/N* |
| Is there any fertiliser restrictions? | *Y/N* |

→ **• Incorporate into the FMP**

# Conserving Biodiversity

**Q: Are there any opportunities to conserve or enhance biodiversity?**

Yes

No → **Go to Restoring Bogland**

| *Biodiversity Checklist* | |
|---|---|
| Does an ecologist report exist? | *Y/N* |
| Can existing biodiversity be conserved? | *Y/N* |
| Any local wildlife merits in extending rotations? | *Y/N* |
| Do spatial connectivity opportunities exist? | *Y/N* |
| Are restructuring opportunities present? | *Y/N* |

→ **• Incorporate into the FMP**

# Restoring Bogland

**Q: Is bog restoration worthwhile?**

| Description of area | *Score* |
|---|---|
| In or adjoins an SAC (blanket and raised bog) | *2* |
| Not in or adjoining an SAC (blanket and raised bog) | *0* |
| Hydrologically linked to SAC | *2* |
| Bog vegetation present | *2* |
| Timber crop has not closed canopy | *2* |
| Timber crop has closed canopy | *1* |
| Little restoration work needed to restore bog | *2* |
| Extensive restoration work needed to restore bog | *1* |

**(Score 3 or more)**
Suitable for bog restoration

***(Score 2 or less)***
*Not suitable for bog restoration*

- **Incorporate into the FMP**
- **Consider environmental broadleaf planting**

**Go to Enhancing the Visual Landscape**

# Enhancing the Visual Landscape

**Q: Is the landscape sensitive?**

Yes

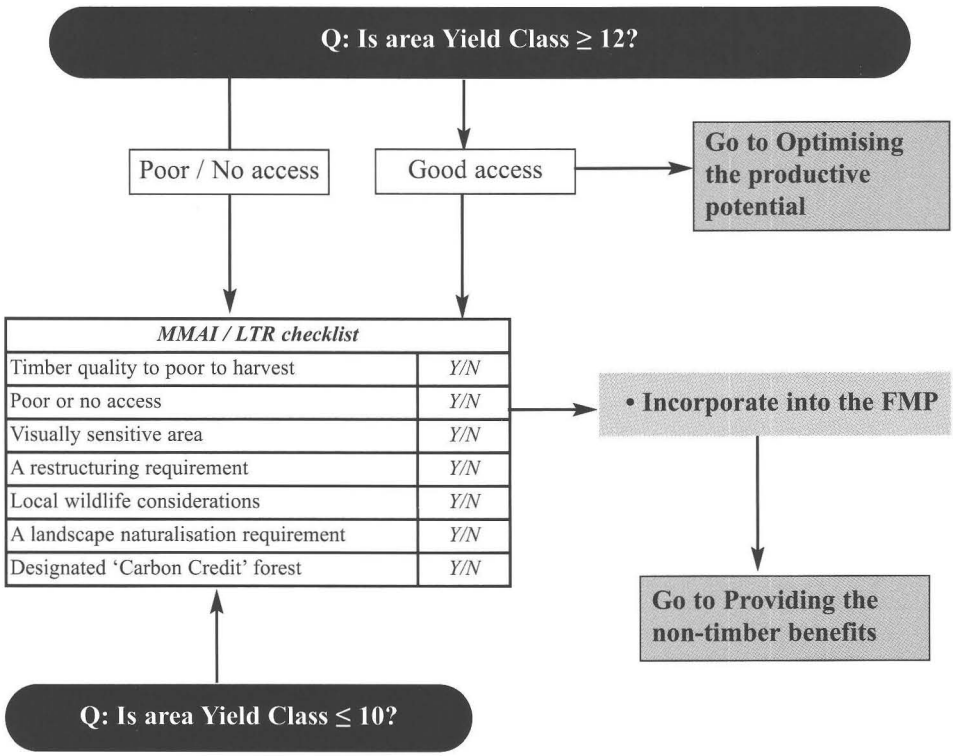
No → Follow Forest Service Guidelines

| *Visual design checklist* | |
|---|---|
| Is there a plan for landscape naturalisation? | *Y/N* |
| Are external margins to be redesigned? | *Y/N* |
| Will the tree line be lowered from the slopes? | *Y/N* |
| How will the restocking plan aid visual design? | *Y/N* |
| Will there be environmental broadleaf planting? | *Y/N* |
| Do spatial connectivity opportunities exist? | *Y/N* |
| Is area used extensively for recreation purposes? | *Y/N* |
| Is stand retention required? | *Y/N* |
| Will restructuring aid visual redesign? | *Y/N* |
| Will buffer zone management aid visual redesign? | *Y/N* |
| Will biodiversity management aid visual redesign? | *Y/N* |
| Will bog restoration management aid visual redesign? | *Y/N* |

**• Incorporate into the FMP**

**Go to Optimising MMAI / LTR**

# Optimising MMAI / LTR



# Providing the non-timber benefits

**Q: What are the non-timber benefits?**

| | | |
|---|---|---|
| Recreation | Game shoots | *Y/N* |
| | Angling | *Y/N* |
| | Hill walking | *Y/N* |
| | Pony trekking | *Y/N* |
| | Other | *Y/N* |
| **Alternative land uses** | Wind farm potential | *Y/N* |
| | Quarry | *Y/N* |
| | Commercial/domestic developments | *Y/N* |
| | 'Carbon Credit' forest | *Y/N* |
| **Cultural merits** | Archaeological heritage | *Y/N* |
| | Ecological heritage | *Y/N* |
| | Local heritage | *Y/N* |

- Incorporate into the FMP