

# Forestry and Recreation

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## Introduction

In this paper, we review the existing levels and trends of forest recreation in Ireland to the extent that the data allow. We then examine its value, and conclude with a review of the policy implications. An appendix is included which outlines general issues in forest recreation valuation.

## Existing Levels and Trends

In the NESC Report No. 46 (Convery, 1979), Irish Forestry Policy, the data for visits to forest Parks are given as contained in Table 1.

These data show an overall compound annual rate of growth of 12 per

cent, with considerable variation within this total. What has happened since 1976? While there are figures for charged day visits to Coillte's forest parks (Table 2) these data are not comparable with those in Table 1 since they do not capture the number of visitors who enter on days when no charge is levied. However, aggregate data are provided in Table 3 (Coillte's figures do not include patrons of the Killykeen holiday complex).

These data seem to indicate two things:

- The very high level of visitation to the State-owned forests; over 1.5

<i>Park</i>	<i>Year</i>			<i>Annual Avg. Growth Rate (%)</i>
	<i>1972</i>	<i>1973</i>	<i>1976</i>	
Ards	—	27,845	51,708	23
Avondale	—	18,000	36,000	26
Dœn a R'	38,460	52,475	60,742	12
Gougan Barra	71,000	56,000	58,000	-5
Lough Key	125,000	147,000	264,000	21
JFK	115,300	90,000	80,000	-9
Total	349,760	392,156	550,450	12

**Table 1.**  
*Number of visits to Forest Parks, 1972 to 1976.*

Note: Growth rate computed from the widest spread of data available, except for the total, where the rate is computed from 1973 to 1976.

Source: Convery, 1979 p. 93.

**Table 2.**  
*Day Visits to  
Coillte Forest Parks  
for which a  
Charge<sup>1</sup> is Levied<sup>2</sup>*

Forest Park	County	Visits <sup>3</sup>
Ards	Donegal	15,000
Portumna	Galway	4,000
Rossmore	Monaghan	1,000
Dún an Rí	Cavan	20,000
Lough Key	Roscommon	60,000
Currahchase	Limerick	6,000
Farran	Cork	15,000
Gougan Barra	Cork	13,000
Killykeen	Cavan	4,000
Donadee	Kildare	4,000 <sup>4</sup>
TOTAL		142,000

Notes:

<sup>1</sup>A Charge is levied when it is considered economical to do so eg. weekends, high season etc.

<sup>2</sup>1993 Figures.

<sup>3</sup>to nearest thousand.

<sup>4</sup>Excluding caravan park.

Source: Personal Communication, Coillte (M. Brennan).

**Table 3.**  
*Forest usage,  
Republic of Ireland.*

Category	Numbers (000s)
All Forest Use <sup>1</sup>	1475
Forest and Other Parks <sup>2</sup>	587
Specialist Groups:	
Orienteers <sup>3</sup>	30
Walkers <sup>4</sup>	230

Notes and Sources:

<sup>1</sup>1993 Figures Including visits to Forest Parks, and all other forest visits (walking, orienteering etc.) in Coillte's forests. Source: Personal Communication Coillte (M. Brennan).

<sup>2</sup>Includes National Parks (under jurisdiction of OPW) as well as Forest Parks. Source: Tourism International, 1994.

<sup>3</sup>Source: Personal Communication IOA (F. Cunnane).

<sup>4</sup>Tourist<sup>7</sup> walkers. Source: Bord Fáilte, 1992.

million visits from a resident population of less than 3.5 million is impressive.

- The negligible growth – and perhaps the drop – in visits to Forest Parks since 1976.

This lack of growth stands in contrast to the pattern of rapid growth recorded in the case of the 37 National Monuments under the control of the Office of Public Works, where visitor numbers have risen from 835,962 in 1989 to 1,481,529 in 1993, an average annual growth rate of 15 per cent; this exaggerates the growth rate slightly, because the 1993 number includes some new sites – notably Cide Fields and Hill of Tara – which have come on stream since 1989 (Scully, 1994). However, it is consistent with the steady state situation which prevails vis-a-vis visitor numbers to forests in Northern Ireland (Table 4).

Although growth is modest, the number of paying visits amounts to about one third of the NI population. The NI Forest Service is planning on putting in place mechanisms which

would facilitate the measurement of visits to other forests. There is a little more growth in the numbers caravanning and camping, and those staying at youth sites (Table 5).

It seems likely that in both jurisdictions, Forest Park recreation has matured in the sense that the local market is "saturated" and there is little participation in the rapidly growing tourist industry, whereas, presumably, the National Monuments and historic sites are benefiting from this growth. There is also a question as to the extent to which the forests as at present constituted have comparative advantage in the world tourist market as magnets. For North Americans who have savoured the profusion of colour of the Appalachians in the spring, or the majesty of the redwoods of California (or even of Sitka spruce in the Olympic peninsula...) the Irish diet of Sitka spruce and lodgepole pine may not be irresistible. In the Republic, statistics may well also reflect the fact that Coillte is not recovering even the variable costs of its recreation provision. Given the company's very explicitly commercial brief, there seems to be little incentive to promote or otherwise develop the recreational facets of the forests under its control, an issue we address later on.

However, there are domains where our forests may have a niche in the international tourism market, and this is where forests are used as "backdrop" for other activities:

Forests in Ireland are used for walk-

<i>Forest Park</i>	1989 (000s)	1992 (000s)
Tollymore	151	139
Castlewellan	62	60
Gortin Glen	22	28
Gosford	41	54
Glenariff	72	66
Slieve Gullion	7	6
Lough Navar	18	20
Ballypatrick	17	17
Portglenone	7	14
Parkanaur	8	9
Car Permit Holders	43	45
Total	481	484

Source: Northern Ireland Forest Service, 1994.

ing, enjoying the scenery, camping, pony trekking, horse riding, mountain biking, motorcycling and orienteering. Waymarked trail walking is a relatively new pursuit in Ireland with the first trail being opened in 1982. In Ireland all waymark trails with a couple of exceptions have some portion in woodland (Fig. 1). The Mountaineering Council has over 3500 members but sales of walking guides are well in excess of this figure (personal communication, J. Lynam, Chairman, Long Distance Walking Groups Committee). There are an increasing number of accommodation providers who are 'packaging' forest walks as a core part of their attraction (Convery et al, 1992).

The Long Distance Walking Groups Committee have made a submission to the Forest Service for the

**Table 4.**  
*Number of  
Paying Visitors to  
NI Forests (000s)*

<i>Activity</i>	1989	1992
Caravanning and Camping Usage (nights)	19,571	21,526
Youth Sites (nights)	12,226	13,442

Source: Northern Ireland Forest Service 1994.

**Table 5.**  
*Overnight Stays at  
NI State Forests*

Strategic Plan for the Development of the Forestry Sector to the Year 2015 which lists that one of its aims is "to assess the potential of the various elements of the forestry sector to make a greater contribution to national economic and social well-being" and invites interested parties and the public to prepare submissions.

Orienteering was developed by the Swedish Army in 1903 and was established in Ireland in 1969. As a sport it is reliant on forests for its survival. Results are distorted when competitions takes place on open land since it allows competitors to see other runners. The sport encourages skill in map reading and is the second most important sport in army circles, second only to shooting and as such is of importance for army and Garda training. Competitors range in age from 8 to 65 years and as such is very much a family sport at a cost of about £2 per competitor. In 1993, 153 orienteering competitions were organised under the auspices of the Irish Orienteering Association with the number of runners varying from between 150 and 600. Assuming an average of only 200, this means that more than 30,000 runs were made last year. Club membership is about 2,100 with an estimated 1,000 others also involved. In 1993, an estimate was made by Coillte of the impact of Orienteering on a forest. The OPW tested the Leinster Championships at Cronybyrne, near Rathdrum and informed the Association that they found no detrimental signs and no rubbish (personal communication, F. Cunnane, National Fixtures Sec., Irish Orienteering Association).

### **Tourism**

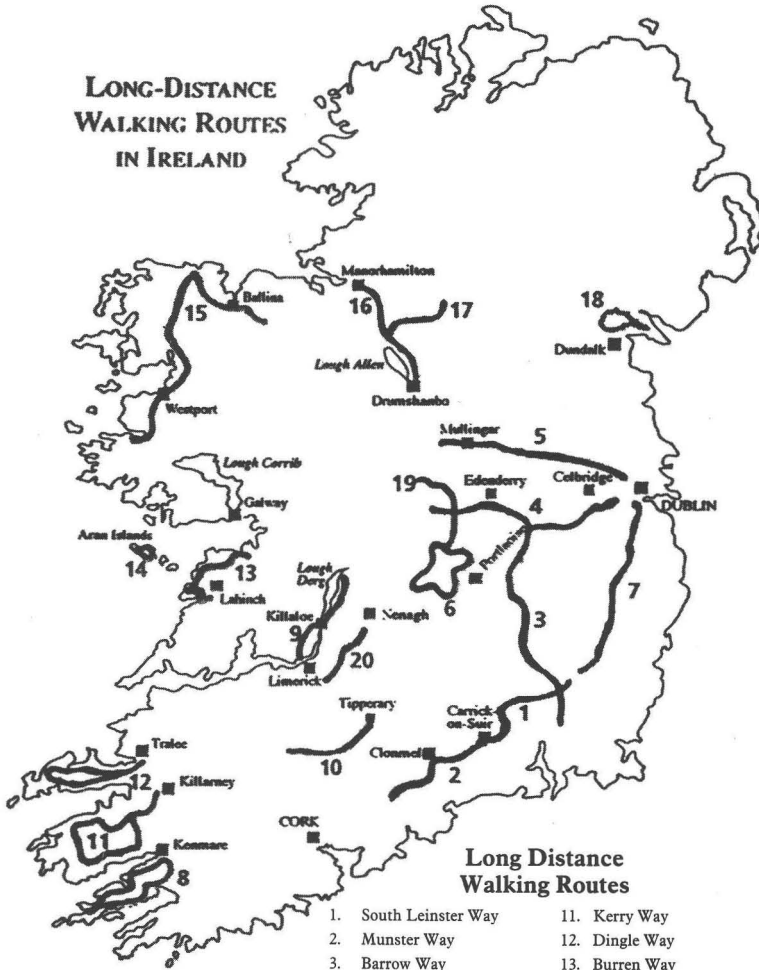
In Developing Sustainable Tourism (1992) Walking is deemed to be the

third most important special interest product for ROI with 230,000 overseas participants in 1991 of which 40,000 had their choice of holiday destination influenced by the provision of this facility. Bord Failte's target is to raise these numbers to 350,000 and 70,000 respectively by 1997. Bord Failte proposes to establish Ireland as an internationally recognised centre for adventure sports such as Orienteering. In 1991 7,000 overseas visitors participated in adventure sports of which 3,000 were influenced in their choice of holiday destination by the facilities provided and the intention is to increase these numbers by 1,500 and 1,000 respectively by 1997. These facilities are of great importance in providing niche markets for tourism in Ireland. From these figures it is clear that forests can help to attract tourists. This is most important when you consider that foreign and domestic tourist expenditure amounted to £1,717.8m in 1991, the exchequer raised £326m from foreign tourism and £149m from domestic tourism by way of taxes and tourism revenue accounted for 7.3 % of all exports of goods and services (Bord Failte, 1993). It is worth noting that over one third of all visits to Irish tourist attractions are made by Irish residents (Tourism Development International, 1994).

What income and employment impacts might reasonably be expected? Assuming an average expenditure per visitor of £325 (Department of An Taoiseach, 1990) and a total expenditure (direct and indirect) per job generated of £25,000 (Deane and Henry, 1993), then 40,000 visitors would have the following employment impact:

$$40,000 \times 325 \div 25,000 = 520 \text{ jobs}$$

**LONG-DISTANCE  
WALKING ROUTES  
IN IRELAND**



**Long Distance  
Walking Routes**

- |                       |                        |
|-----------------------|------------------------|
| 1. South Leinster Way | 11. Kerry Way          |
| 2. Munster Way        | 12. Dingle Way         |
| 3. Barrow Way         | 13. Burren Way         |
| 4. Grand Canal Way    | 14. Aran Way           |
| 5. Royal Canal Way    | 15. Western Way (Mayo) |
| 6. Slieve Bloom Way   | 16. Leitrim Way        |
| 7. Wicklow Way        | 17. Cavan Way          |
| 8. Beara Way          | 18. Tain Way           |
| 9. Lough Derg way     | 19. Offaly Way         |
| 10. Ballyhoura Way    | 20. Slieve Felim Way   |

### Valuing forest recreation benefits

It is typically the case that it is difficult practically and politically for the owner – and especially the public owner – to “capture” in the market place the benefits which forest recreation provides. Three methods have been developed to place a value on forest recreation. These are: Contingent Valuation (involving surveys of beneficiaries), Travel Cost (involving using travel costs to derive willingness to pay) and Hedonic Pricing (involving use of effects of forests on property values). The background and rationale of these approaches are described in some detail in Annex A, as are the results of a number of studies in the UK, Netherlands and Sweden.

The results of a well known valuation study in the UK are shown in Table 6.

Hutchinson and Chilton (1994) examine forest recreation in Ireland and Scotland using Contingent Valuation and multi-site Travel Cost (see appendix A for an explanation of these terms). Thirteen sites were chosen in ROI and fourteen in NI comprising 0.7 % and 13 % of the forested area in each jurisdiction respectively. Willingness to Pay (WTP) a site entry charge for a single day visit to a ROI forest varied

from approximately £0.80 to £2.18, with an average WTP of approximately £1.50. These figures are lower for NI with lower and upper bounds of approximately £0.60 and £1.55 with an average WTP of approximately £1.10. Some of the most frequently visited sites received a lower average WTP. Since many of these sites are urban forests WTP is reduced by frequent return visits. Aesthetic assessments of the sites were undertaken and the authors report a positive correlation between site quality and WTP. Total recreational benefit for the sites studied was £6.25 million in NI and £7million in ROI. They estimate total recreational benefit by adding declared travel and other visit related expenditures to average WTP site entry charges which are then raised by estimated visitor numbers. The study finds no relationship between site size and total recreational benefits.

The authors suggest that the generally high value of urban forestry combined with the small geographical size of their market area provides a “strong argument” for more resources to be devoted to this form of land use. The study estimates that over 50 % of recreational visits took place on sites covering 0.7 % in ROI and 0.4 % in NI. This

**Table 6.**

*Estimates of British forestry recreation values using the Travel Cost Method (Benson and Willis, 1990).*

	<i>Lowest Value Forest (1988 £)</i>	<i>Highest Value Forest (1988 £)</i>	<i>Mean Value Forest (1988 £)</i>
Individual recreation value (per visit)	1.34	3.31	2.00
Recreation value per ha	1.00	428.00	47.00

Source: Bateman, 1992.

Year	State Forests 000s ha	Private Forests 000s ha	Total 000s ha
1922	10	106	116
1938	19	101	120
1993	439	163	602

Source: Convery and Clinch; Forest Service, personal communication; NI Forest Service, 1994.

**Table 7.**  
*Forest area, Ireland,  
1922, 1938 and  
1993.*

would suggest that the majority of subsidies for the provision of forest recreation should go to a small geographical area rather than to all forest owners.

If, for purposes of illustration, we apply the average willingness to pay per visit of £1.50 to the estimate of visit numbers to Coillte's forests of 1.475 million, we find a total annual WTP of just over £2.2 million. (Note that this figure does not give the total cost to the consumer of forest recreation since it does not include other costs the consumer is willing to pay to experience forest recreation such as travel cost and opportunity cost and thus is not directly comparable with Hutchinson and Chilton's estimate of total recreational benefit).

The Coolatin oak woods provide an interesting example of willingness to pay on the part of the Irish public to conserve a woodland which they regard as of some uniqueness. Approximately IR£40,000 was collected from private individuals to support the public purchase of the woods; presumably this was done in the main with altruistic intent, without any hope or expectation of pecuniary gain. The Coolatin case comprises an example of what economists call 'option value' a willingness to pay to keep options open. It is a separate question as to what such options are; what is of interest for our purposes is that there was a "willingness to pay".

### **The supply of forest recreation in Ireland**

The extent of the forest estate in Ireland is shown in Table 7. While it is clear that the majority of the forested area is owned by Coillte or the NI Forest Service, annual planting by private investors has increased dramatically over the last ten years as a result of falling returns from farming and increasing grants for forestry (Table 8).

It must be noted that some of this forestry would not be suitable for recreational use and not all is available for such a purpose.

Forests are increasing in importance for outdoor recreation as public access to farming land becomes increasingly limited. In the UK, the government's "Forestry Review Group" has been examining the costs and benefits of selling off portions of the Forestry Commission's estate. The estate consists of over 1m ha and has a potential value of £1.7 billion. The Review Group has received submissions from some 300 organisations and 3,000 individuals and faces a strong anti-privatisation lobby led by the Ramblers Association who are concerned about the loss of public access. While woodland has been sold to private companies with an agreement to allow public access, this agreement cannot be continued to a second purchaser (Economist, February 5th-11th 1994).

**Table 8.**

*Total planting  
(afforestation and  
reforestation), Ireland,  
1982-93, in hectares.*

<i>Year</i>	<i>State</i>	<i>Private</i>	<i>Total</i>
1982	8,033	687	8,720
1983	7,988	345	8,333
1984	7,988	539	8,527
1985	7,573	844	8,417
1986	8,155	2,623	10,778
1987	8,752	3,477	12,229
1988	11,153	5,584	16,737
1989	11,201	8,738	19,939
1990	11,288	10,315	21,603
1991	12,052	11,930	23,982
1992	12,420	9,654	22,065
1993	12,003	10,082	22,085

Sources: Convery and Clinch; State planting 1989-92 from Coillte Annual Reports; State planting 1993 from Coillte, personal communication (G. O'Reilly); NI planting 1992-93, NI Forest Service, 1994.

The first official way marked trail, the Wicklow Way, opened in 1982 and there are now 20 ways (Fig. 2) covering 1700 km of walking (Cospoir, 1994). The routes are established in co-operation with Bord Failte, Coillte, private landowners and local authorities. Bord Failte (1992) estimate that an extra 20 nature trails will be required by 1997 in order to accommodate the increased number of walkers.

### **Incentives to provide forest recreation in Ireland**

#### *Coillte*

Coillte estimates that the cost of providing forest recreation in 1993 was £527,496 or £0.36 per visitor (Table 9). It is important to note that the figure for total cost is comprised of variable cost and depreciation i.e., it constitutes the cost of the upkeep of the forests (the maintenance cost) but does not

**Table 9.**

*Coillte Costs and  
Revenues from Forest  
Recreation<sup>1</sup>*

<i>Category</i>	<i>Amount (000s 1993 IR£)</i>	<i>Per Visit (1993 IR£)<sup>2</sup></i>
Cost <sup>3</sup>	528	0.36
Revenue	267	0.18
Net Revenue <sup>4</sup>	(261)	(0.18)

Notes:

<sup>1</sup>1993 Figures.

<sup>2</sup>Based on number of Visits of 1.475 million.

<sup>3</sup>Not including costs of public liability claims.

<sup>4</sup>Brackets indicate a deficit.

Source: Personal Communication, Coillte (M. Brennan).



<i>Category</i>	<i>Commercial Recreation<sup>2</sup></i> <i>(000s Sterling)</i>	<i>Non-Commercial Recreation<sup>3</sup></i> <i>(000s Sterling)</i>	<i>Total</i> <i>(000s Sterling)</i>
Cost	108	499	607
Admin. Cost	179	343	522
Revenue	190	229	419
Net Revenue <sup>4</sup>	(97)	(613)	(710)

## Notes:

11993 Figures.

2Cost of operating camping and caravan sites at forest parks plus services involving the rearing, selling and shooting of game.

3Cost of providing amenities at forest parks for day visitors.

4Brackets indicate a deficit.

Source: Personal Communication, NI Forest Service (P. Hunter Blair)

**Table 10.**  
*NI Forest Service*  
*Costs and*  
*Revenues from*  
*Forest Recreation<sup>1</sup>*

include the fixed cost of establishing the plantation (personal communication, Martin Brennan). It also does not include any modification of timber management required to accommodate the recreation use in question. The Northern Ireland Forest Service estimate the costs of providing recreation to be £522,000 sterling (Table 10).

**The Public Liability Conundrum:** There is a disincentive to allow access to existing forests for recreational purposes because of fears of damage been caused. However, the largest disincentive would seem to be public liability insurance. Forest owners are liable for possible large payouts even to trespassers who injure themselves while in the woodland. Coillte (and its predecessor) has paid out over £100,000 in damages to visitors to its forests since 1986 including a single payout of £80,000 for an ankle injury. It faces a possible further £130,000 payout in unsettled cases (personal communication, Coillte, M. Brennan). The Law reform Commission is expected to produce a report in the near future which is likely to become the basis for a change in the public liability law.

Annual revenue generated by Coillte from forest recreation in 1993 is estimated to be £267,000 or £0.18 per person. Thus net revenue to Coillte is minus £260,496 (Table 9), to which must be added the cost of meeting public liability costs. This amounts to Coillte subsidising each visitor by 50 % (£0.18). NI Forest Service revenue from forest recreation is estimated to be £419,000 Sterling giving a net revenue of minus £710,000 Sterling (Table 10).

The entrance fees charged at Coillte's forest parks are shown in Table 11. The NI Forest Service levies similar charges at forest parks where it is economical to do so.

Coillte's forest parks are used by a wide variety of groups who apply on an individual basis for permits to carry out certain activities such as orienteering and pony trekking. The Orienteering Association has its own insurance policy such that Coillte are not liable for personal injury during an event. Some private forests are provided free of charge for orienteering (personal communication, F. Cunnane, Fixtures Sec., Irish Orienteering

**Table 11.**  
*Entrance fees charged at Coillte forest parks.*

<i>Category</i>	<i>Entrance Fee (£)</i>
Adults	1
Car/Family	3
Season Ticket	15 (access to all forest parks)
Coach	16
Minibus	8

Source: Personal communication, Coillte (M. Brennan)

Association).

A TDI survey calculated the average admission charge to parks (forests and otherwise) in ROI to be £1.66 with 63 % of those surveyed rating value for money to be "very good" (TDI, 1994).

Grants for planned recreational forestry are payable from the Rural Development Operational Programme. However, grants contribute to establishment costs but not to Coillte's maintenance cost.

From the foregoing, we conclude that there is no incentive for Coillte to provide forest recreation under the pricing and other conditions prevailing.

Under Section 12 of the Forestry Act, 1988, the duties of the company are laid out: They emphasise the financial and commercial dimension, including:

The need to ensure that revenues are sufficient to meet all charges (including depreciation); to generate a reasonable proportion of capital needs; to remunerate capital and repay borrowings; to conduct business in a cost effective and efficient manner.

The only oblique reference to recreation is the duty: to have due regard to the environmental and amenity consequences of its operations.

Defining "due regard" given the other pressures on the company is a

challenge. Under Section 38, the Minister may issue directions in writing to the company requiring the company to, inter alia: provide or maintain specified services or facilities, to maintain or use specified land or premises in the company's possession for a particular purpose.

If the company satisfies the Minister that... it has sustained a loss in complying with a direction under the relevant subsection, it shall be entitled to recover the loss from the Minister.

There is an implicit, if rather weak, recognition here that cross subsidising may be inhibiting the achievement of commercial objectives. However, it seems to us that it would certainly be preferable if there were an explicit understanding as to the recreation facilities and services to be provided, and then if these were budgeted for separately, some perhaps allocated on a tender basis.

#### *Private Investors*

We failed to get any data, for either the Republic or Northern Ireland, as to the nature, extent and potential of recreation on private forest land.

Grant Support for Forest Recreation and Amenity Provision in ROI: Grant applications for planned recreational forestry under the 1992/93 guidelines must include plans and specifications for planting and recreational facilities together with estimated costs and detailed maps. If there is a limitation on public access the reason must be given. The proposal must include at least one planned or existing specific amenity attraction such as fishing lake, picnic sites, substantial river frontage, game development, walks or nature trails or archaeological site; or be located in an urban area. A minimum of 1700 and

1100 plants per hectare is required for conifers and broadleaves respectively. All plantations must include a minimum of 10 % broadleaves and a mixed conifer/broadleaf plantation must contain a minimum of 40 % broadleaves. As with applications under other forestry grant schemes they must comply with the various guidelines related to fisheries, archaeology and landscape. Unplanted space is limited to one third of the total area.

The grant level is set at 85 % for farmers and co-operatives and 70 % for others subject to the following maxima:

£2000	per ha for broadleaves.
£1100	per ha for conifers.
£350	per ha for construction or upgrading of access and recreational facilities including seats and signs.
£200	per ha to public agencies to encourage community involvement and for promotional and educational work.

The progress made by this scheme is shown in Table 12.

The scheme is expected to continue from 1994-99 under the new Forestry Operational Programme but EU approval (at time of writing) has not been received.

In its submission to the EU Commission concerning the Forestry Sub-Programme of the new Operational Programme for Agriculture, the Department of Agriculture, Food and Forestry is seeking to assist further private investment in recreational/amenity forestry under the 1994-99 round of structural funds. It proposes to encourage the conversion of derelict woodland in tandem with the development of recreational/amenity forestry. In such cases woodland owners would be required to provide public access for

a specified minimum number of days per annum. Charging for admission would be permitted as there would be no maintenance grant (personal communication, Forest Service, A. Murray).

Grant aid in the UK: One of the aims of the UK Woodland Grant Scheme (Forestry Commission, 1993) is to "encourage people to create new woodlands and forests to offer opportunities for recreation and sport". In addition to establishment grants and management grants there is a Community Woodland Supplement of £950 per ha which is paid to encourage people to create new woodlands near towns and cities which can be used for informal recreation. To be eligible the woodland must be within 5 miles of the edge of a village, town or city and in an area where the current opportunities for woodland recreation are limited. Charges can be made where special facilities or services are provided. Once the woodland is 11 years old it will be eligible for a Special Management Grant.

It is clear the involvement in Ireland in grant aided amenity/recreational forestry is extremely modest at present. However, it grows, and if one takes the view that there is a greater demand for recreation in broadleaf forests, then this could tip the revenue streams in favour of broadleaves and increase their paltry rate of planting. However, the long

<i>Year</i>	<i>Number of Schemes</i>	<i>Area (ha)</i>
1992	4	172
1993	10	253

Source: Forest Service, personal communication.

**Table 12.**  
*Progress of Planned  
Recreational Forestry  
Scheme*

time span required for the development of a forest (particularly broadleaf) capable of providing a recreational secondary use may be seen as prohibitive. For this reason incentives to convert derelict forest (particularly broadleaf or mixed forest) seem most appropriate.

#### **Attitudes to forest recreation**

Boyle and Storey (1993) carried out a survey at six forest sites in the Greater Dublin area during the summer of 1993 to ascertain attitudes of visitors to the sites and the impact of forest recreation on the residents of Enniskerry, Co. Wicklow. Visitors used the sites mainly for passive recreation, walking, admiring scenery and nature and taking fresh air. The main areas of concern for both local residents and visitors were litter and vandalism and visitors suggested sign posting should be improved. One quarter of visitors were concerned about the security of their car while parked in forest carparks. While few visitors worried about personal safety, local residents were concerned about unsupervised campers. The majority of visitors were not willing to pay an entry fee but were not opposed to the funding of recreational forestry from taxation. Local residents believed that the forests provided an amenity value as well as improving the surrounding environment. The majority of those sampled believed that motorcycling should be banned within forests.

#### **Annex A: General issues in forest recreation valuation**

##### **Introduction**

In his famous treatise *The Wealth of Nations* Adam Smith argued that individuals acting purely out of self-interest

would help to maximise the economic welfare of a nation (Pearce, 1992). This doctrine, known as "laissez-faire", is the basis for the market economy, whereby pressures produced by the free play of market supply and demand will induce adjustment in prices such that the socially optimal (most desirable) quantity of a good is produced. But the untrammelled market does not achieve all of society's objectives: the market fails. In forestry, market failure occurs where the market does not produce a socially optimal level of a particular forest service or product. This happens in the case of inputs and outputs which are not bought and sold through markets, where costs are not borne by the perpetrator of same, and benefits are not captured by the provider thereof. These are called external costs and benefits, or externalities. External effects are commonly found in forestry (Figure A1):

It is important to note that forests can simultaneously be a generator of external costs and benefits in the same category. Thus, some forms of recreation, e.g. orienteering, will be expanded, while others, e.g. grouse shooting, may be diminished.

Externalities result in an inefficient allocation of society's scarce resources; where the forest owner is producing external costs and/or external benefits, then, by definition, he or she does not bear the consequences or capture the fruits thereof, and will "overproduce" the former, and "under produce" the latter.

##### **Recreation as an external effect**

Recreation can be considered as a positive or negative externality produced by forestry. Walking, taking nature trails, camping, picnicking, hunting, berry picking, horse riding, orienteering, mountain bike riding, motorbike scrambling, bird and wildlife watch-

ing, 'paint-balling', fishing in forest lakes, army training, scouts and girl guides expeditions etc. can all take place in forests. Thus, forests make an important contribution to the well-being of the population and make a significant contribution to revenue from tourism. However, forests can also take away open spaces and destroy the ecological and archaeological environment and thus restrict recreation, thereby imposing external costs.

#### 'Capturing' the benefits accruing from forest recreation

Are the recreation benefits yielded by forests external, i.e. are they such as cannot be 'captured' by the forest owner? For the most part, they are: numerous small parcels of land make limiting access difficult and expensive technically, and it can also be fraught politically. How can these external benefits be 'internalised' such that Coillte or the private investor can capture the benefits? Unless such internalisation takes place, the investment (path clearing, sign posting, picnic and camp site provision etc.) needed to provide the optimum level of recreation will not be forthcoming. 'Optimum' in this context is the provision of recreation and other forest goods and services such that the gap between benefits and costs, i.e. net benefit, is maximised. But for the forest owners to give appropriate weight to recreation, they must get a 'signal' which encourages them to give it due weight.

Let us look at a highly simplified hypothetical example below: In columns (i) through (v) in Table A2, the forest is used to produce wood and recreation; the costs and outputs are shown for various levels of input. It is assumed that the inputs and outputs are all measured in the same units. In

<i>External Benefits</i>	<i>External Costs</i>
Wildlife Habitat	Destruction of
Natural Landscape	
Biodiversity	Recreation Loss
Shelter	Amenity Loss
Soil Stability	Habitat Loss
Amenity	Biodiversity Loss
Recreation	Soil Degradation
Carbon Sinks	Loss of Game
Macro-climate	Hydrological:
Regulation	water traps
Berries/Game	acidification
Ecology Value	silting
Hydrological:	Reduction of
regulation storage	Archaeological
Endowment	

Source: Bateman, 1992

**Fig A1.**  
*External Costs and Benefits of Forestry.*

columns (vi) and (vii), the situation in this regard is where the forest is used to produce wood alone is shown. In the case of the combined product, the forest can, up to a point, produce more recreation and wood. Up to an input level of 20, the production of wood and recreation are complementary in that both can increase. However, thereafter, recreation can only be increased if wood output is decreased - the uses are competitive. It can be seen that net output is greatest - at 10 units - at input level 30, yielding 30 units of recreation and 10 units of wood. If the forest is used to produce wood alone, then the optimum input level is 20, with a net of six.

A few points are notable:

- In practice, we know very little about the Production function for

**Table A2.**  
*Hypothetical  
Combinations of  
Recreation and  
Wood Output  
from a Forest.*

<i>Input (Costs) (i)</i>	<i>Recreation Output (ii)</i>	<i>Wood Output (iii)</i>	<i>Total Output (iv) (ii)+(iii)</i>	<i>Net Output (v) (iv)-(i)</i>	<i>Wood Only Output Gross (vi)</i>	<i>Output Net (vii) (vi)-(i)</i>
10	0	5	5	(5)	5	(5)
20	10	15	25	5	26	6
30	30	10	40	10	33	3
40	33	9	42	2	38	(2)

forest recreation, the outputs which would be yielded by differing levels of input, and we know very little about the trade-offs, if any, involved in producing more recreation and less wood (or other outputs).

- It is clear that if the recreation output noted in the example above could not be captured by the forest owners (and if there were no other outputs the benefits of which they could capture) they will produce wood, yielding a net benefit of 6, instead of the 10 yielded by the combination.

This illustrates why it is so important to somehow 'reward' the forest owner for producing the socially correct level of recreation, defined in this case as the level, combined with other output, which maximises net benefits. It also illustrates the need to derive a value for recreation which represents somehow the value society places on the experience provided and availed of.

#### **Measuring the value of forest recreation**

Demand for recreation can be subdivided into three types of demand (Benson and Willis, 1991). Effective demand is measured by the number of

visitors to forests. Deferred demand is the result of people placing an 'option value' on forest recreation whereby they value forestry simply because they know the facility can be availed of in the future by themselves or future generations (the 'bequest motive'). Potential demand for forest recreation can result from a number of factors including technological or socio-economic change. Altruism can play a role such that people obtain some value from knowing that others enjoy this facility.

There are a number of methods available to value a non-traded good such as forest recreation. Amongst these are:

#### **Contingent valuation**

This method collects preference information by way of a survey in an attempt to measure the willingness of individuals to pay for an increased (or decreased) provision of forest recreation. The question posed to individuals in the survey might be as follows:

"It is suggested that a National Park be established. This would allow locals and visitors to take scenic walks, hunt, pick berries etc. The project will be financed by a general income tax. Would you as a citizen be willing to incur an A % increase in income tax to

finance such a scheme?" If the answer is no, the tax change is decreased until willingness to pay (WTP) is established.

### **Travel cost**

This uses individuals' actual behaviour rather than what they say they will do. Demand for a recreation site can be measured by the costs of travel to that particular site. Assume there is a single forest that can be reached by individuals in a certain area. The area can be divided into a number of zones according to distance from the forest, say, zones A and B. The number of trips per capita and the average travel cost for these trips from zone A and zone B (which is further from the park) are calculated by surveying those attending the forest park from these areas. Sets of observations like these can be used to estimate a "distance decay curve for trips" which is negatively sloped such that the farther away from the forest a community is situated, the higher cost and the fewer the visits, all else equal. Average consumer surplus from a visit to the forest park from areas A and B is calculated from the curve and total aggregate willingness to pay for the forest is given by total consumer surplus plus actual travel cost. The assumption is implicit that the visitor who travels farthest, i.e. incurs the greatest travel cost, is at the margin; they would not have left home for this facility if they knew that they would be charged an admission.

### **Hedonic prices**

This method involves deriving some indication of the value of a forest by comparing prices of housing identical in all respects apart from distance from a forest.

### **Appropriateness of measurement methodology**

Both the Contingent Valuation and Hedonic Prices approaches would make it difficult to distinguish between externalities and so make it difficult to isolate WTP for recreation. There are many factors involved in the purchase of a house apart from proximity to a forest let alone recreational use. Studies have been done in Britain to estimate the value of total external effects from forestry using hedonic prices (e.g. Garrod and Willis, 1992), but it is generally felt that the Travel Cost Method is more useful since it can isolate recreation more easily. However, the assumption that utility is uniform across visitor categories is very strong and limiting.

The main problem with the Contingent Valuation Method is that there is an incentive to "free-ride". If consumers have to pay according to their stated willingness to pay, they may try to conceal their true willingness to pay in order to qualify for a lower price. However, if respondents believe that the price or the tax charge is unaffected by their response, they may have an incentive to overstate their WTP (Johansson, 1992). While the Contingent Valuation Method explicitly states the aim of valuing recreation to those completing the questionnaire there is the risk that individuals may intentionally or subconsciously take other external effects or prejudices for or against forestry into account when answering, and people may or may not take into account the opportunities forgone by using the forest for recreation. The Travel Cost Method is likely to provide a lower bound on the value of recreation since it seems fair to assume that the value of recreation to individuals must be worth a sum that

is at least equal the cost of getting to the forest. Problems arise in that unlike the Contingent Valuation Method this travel cost cannot capture option values or altruism. There are also likely to be variations in tastes, incomes, etc. across the population zone used to estimate the distance decay curve.

#### **Practical examples of forest recreation valuation**

Bateman (1992) gives a useful outline of studies which attempt to put a value on recreation in the UK. In 1972 the UK Treasury used surveys of car numbers at forest parks and applied an imputed parking fee which resulted in a figure of £1.32 million (approximately equal to £9 million in 1990 values). In 1986 the National Audit Office estimated the value of informal recreation to be £10m using the same technique. The indirect technique of using a parking fee is unlikely to capture total benefit from or willingness to pay for recreation. Benson & Willis' (1990, 1992) study using the Travel Cost Method places a value of £53 million (1988 prices) on recreation in the total Forestry Commission estate and the results are shown in Table 5 of the main text. This study was undertaken to justify the subsidisation of the Forestry Commission's losses despite government funding of £30 million.

In response to the criticism that some visitors may view their costs as petrol alone while others may take time and car running costs into account, Willis & Garrod (1991) undertook another study using the Travel Cost Method based on petrol costs alone. This produced a startling reduction in recreation value per visit from approximately £2.00 to £0.60 and a consequent reduction in the total annual recreation

value of the Forestry Commission estate from £53 million to £9 million per annum. Garrod and Willis (1992) use the Travel Cost Method to estimate consumer surplus of non-priced open-access recreation and valued it at £8.665m. They suggest that since people only visit forests for recreational purposes once or twice per year on average, recreational aspects of forestry don't enter into household's location decisions. While the estimates are seen to be widely variable, it does show that there is some justification for

Government subsidy, i.e. grant schemes, purely in relation to recreational value. McGilvray and Perman (1991) suggest that few estates can rely upon income from sporting use alone. With returns to agriculture decreasing and forestry investments not being particularly attractive the combination of agriculture and/or forestry with recreational use may be necessary to maintain viability. However, the social opportunity cost of land is rising as the derived demand for recreation on open land increases.

In May 1987, a face to face survey was carried out amongst a sample of 499 Dutch householders to estimate the social costs of damage to forests and heathlands which was assumed to take place in the future if air pollution was not reduced. The central question was what Dutch people would be willing to pay to avoid a further deterioration in the National Forests and heathlands. It was assumed that recreational and aesthetic values of the forest would be significantly reduced in the event of the deterioration taking place. On average, respondents were willing to pay 11 (1987) ECUs per month (with a median value of 5 ECU per month). This mean value amounted to 689 million ECU (1987)



for Dutch society as a whole (van der Linden and Oosterhuis, 1988).

The very high Dutch values are a reflection in part of the high population density, high levels of income, education and environmental awareness, and the relative paucity of forest. In Sweden, where forests are pervasive, and farm land is relatively scarce, there is a willingness to pay to prevent half or all of agricultural land to be converted to spruce forests (Drake, 1987).

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