

Forest Recreation in a Commercial Environment

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SUMMARY

Recreation is an increasingly important function of the forest, delivering a broad range of benefits to society and supporting rural tourism and economic development. Forest owners, both large and small, are critical to delivering these functions. However, frequently they see little in terms of economic dividend from this provision. Coillte contends that such services, whether provided by large or small landowners, should be supported by fund transfers. The mechanisms exist to calculate these non-market benefits. Coillte commissioned a study in 2005 to evaluate the contribution their forests make to national well being and also the economic activity recreation generates in rural communities. The study used both Willingness To Pay and Costless Choice methods to evaluate the non-market benefits (€97 million) and economic activity (€268 million).

Recreation can also be delivered when commercial focus and market demand are aligned. Two examples of bringing a market focus to delivering forest recreation are outlined in this paper.

FORESTS A VALUABLE RECREATION RESOURCE

Forests across the developed world are very suitable locations for all types of recreation. Forests, due to their attributes, make an excellent environment for outdoor recreation in the Irish context.

- They are robust landscapes capable of absorbing large numbers of people due to their

ability to absorb noise and screen visitors.

- In Ireland forests are well served with forest roads, rides and tracks, which allow and encourage access.
- Forests are generally perceived by most users as “wild places” and often have added interest due to flora and fauna and historical artifacts.
- Their geographical spread in Ireland means that they are easily reached by the majority of the population and are often situated in areas of high amenity value.

The range of recreation activities in Irish forests includes walking, hiking, camping, fishing, hunting, orienteering, motor sports, equestrian sports, and commercial activities such as paint balling and off road vehicle driving. Forest recreation also includes passive forms of activity such as picnicking or just sitting and enjoying the view.

INCREASING DEMAND BRINGS MORE BENEFITS

As Ireland (and Europe) becomes more urban and population increases, the requirement for outdoor recreation resources and spaces is also going to increase. Recreation is a “service” that will be sought by increasing numbers of visitors. More use of the forest will mean that increasing numbers of users will benefit from a range of recreation related services. This increase will bring opportunities for economic activity and rural development through the tourism and other sectors. How these economic benefits are distributed equitably – amongst providers and users - is one of key issues that will impact on the availability of forest recreation into the foreseeable future.

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DISTRIBUTING THE BENEFITS OF RECREATION

The issue for all forest owners, large and small, is how will the benefits that accrue from recreation be distributed? Who benefits and who pays? This paper sets out to examine a number of approaches to capturing the value and will attempt to look not only at how a large commercial forest owner is approaching the issue but will also look at the issue from the small owner's perspective, and how commercial activities and government support can address this issue. The paper also looks at some work undertaken to assess the value of recreation in generating economic activity in a local community as part of a rural development strategy.

IRISH FOREST ESTATE AND RECREATION

In Ireland the national forest estate currently covers approximately 10% of the total land area. Approximately 60% or 445,000 ha of the national forest estate are in state ownership – lands owned and managed by Coillte. Private woodland owners, with a range of land holding sizes, control the remaining 40%.

In Ireland there is no recreation access legislation or public trails network with a right of way and there is little public or municipal land available for outdoor recreation. Currently access to the countryside for recreation is limited to Coillte lands which allows permissive access¹ to its lands, National Parks and Wildlife Service which owns approximately 66,000 ha (1%)² of the land area and Waterways Ireland³ which manages many of the country's major river systems. Access to the rest of the country while "allowed" is currently a matter of major contention between recreational users and some of the key farming and landowning organisations. The forest estate in Ireland is well distributed across the country to deliver recreation to an increasingly urban population. With the current legal access to countryside for recreation still an issue, Irish forests have a significant part to play in satisfying this demand.

FOREST RECREATION AND TOURISM IN IRELAND

Tourism makes an important contribution to the Irish economy with a major emphasis on the green and natural image of Ireland. Much of this image is based on scenery and a warm welcome – a welcome where a legal access is limited to Coillte forests and national parks. Walking/hiking and cycling are important market segments for the tourism sector into the future and have been identified⁴ as critical in delivering rural development through special interest tourism with geographic spread.

A recent audit⁵ by the National Way Marked Ways Advisory Committee (NWWAC) of the Irish Sports Council identified that over 53% of all walking routes are on public roads with over 55% of the remainder on forest lands. Forestlands provide the single biggest off road walking experience for a significant number of users.

COSTS NOT BENEFITS FOR THE PROVIDERS

The provision outdoor recreation and tourism infrastructure does not generally provide direct benefits to the provider – the benefits accrue to the user and to the community and industry that service the "day to day" requirements of the visitor. Coillte is the state forestry company, which is charged under an act of parliament⁶ to manage the estate in a commercial manner. Coillte like other landowners is faced with managing a major resource that provides recreation for both citizens and visitors to the country alike. Managing this resource can impose considerable costs.

These can include:

- Installation and maintenance of trails⁷, signage, furniture, car parks etc.
- Health and safety management issues
- Retaining stands beyond economic rotations and employing less economic silvicultural systems in areas of high recreation usage
- Harvesting at less favourable times of the year which can mean higher harvesting costs and possibly lower prices
- Managing anti social behaviour by visitors etc.

From a purely cost benefit analysis the provision of recreation makes little economic sense. The issue for forestland owners is how can some of the benefits of recreation be distributed to the keyholders?

DISTRIBUTION OF THE BENEFITS

An examination of the recreation provision across the developed world reveals it is delivered because it makes economic sense in some way to the provider. This can mean commercial activity or can involve fund transfers or payments.

What I wish to explore in this paper is how this issue is being addressed in the Irish context where forest recreation is delivering both market and non-market benefits and contributing to rural and economic development. I will look at three separate areas.

- Fund transfer and the need to value the non-market benefits of recreation
- A brief examination of the contribution of recreation to economic development in rural areas.
- Developing models to deliver recreation and tourism benefits within a commercial framework. A brief review of some tourism developments that have potential to deliver recreation, economic activity and rural development.

FUND TRANSFERS AND THE NEED TO VALUE RECREATION – THE ECONOMIC CONTEXT

Recreation in forests in Ireland makes a considerable contribution to supporting the tourism industry – as we saw earlier the forests are the primary area where visitors have access to the countryside – and thereby supports economic activity and development in rural communities. It is also generally accepted that forest recreation contributes significantly to national health and well being. However Coillte provides this service funded entirely from its own resources, on an operational basis. Currently access to private forestlands is virtually non-existent because there

is no positive economic reasons why they should be involved.

Across the developed world state forest organisations are funded to deliver outdoor recreation. This for example is the case in Finland⁸ and Scotland⁹ two benchmark countries reviewed by Coillte. It is our view that the forest sector should be supported in delivering this very valuable national service.

Before one presents an invoice one must calculate the charge. A prerequisite to any funding initiatives is to make potential funders aware of the value that the service is currently or potentially capable of delivering. While some may argue on a philosophical basis that we should not be attempting to put a value on recreation, the valuation of the non-market benefits is essential for planning, resource allocation and in this case generating support – in both financial and political terms.

Assigning a value to informal recreation is difficult because often no markets exists by which it can be valued - in general, visitors do not pay an entrance fee. However since the early 1930s economists have been developing models to calculate these non-market benefits. Broadhurst and Harrop¹⁰ describes the total economic value of recreation as a combination of the direct values that accrue to the user (including both use and non-use values), and indirect values, for example, those that accrue to the tourist industry, See Figure 1. Direct values are of interest to the landowner as they are both the collectable (market charges) and uncollectible revenue from the provision of recreation. Indirect values are a useful tool in examining the impact of recreation on the economy of a region.

VALUING RECREATION IN IRELAND

A limited number of studies had previously been undertaken in Ireland to value the recreational benefits of the forest estate. In 1984 a field test was undertaken to test a number of different valuation methods under Irish conditions¹¹. A broader and more detailed study was undertaken by the CAMAR report¹², as part of a project to determine

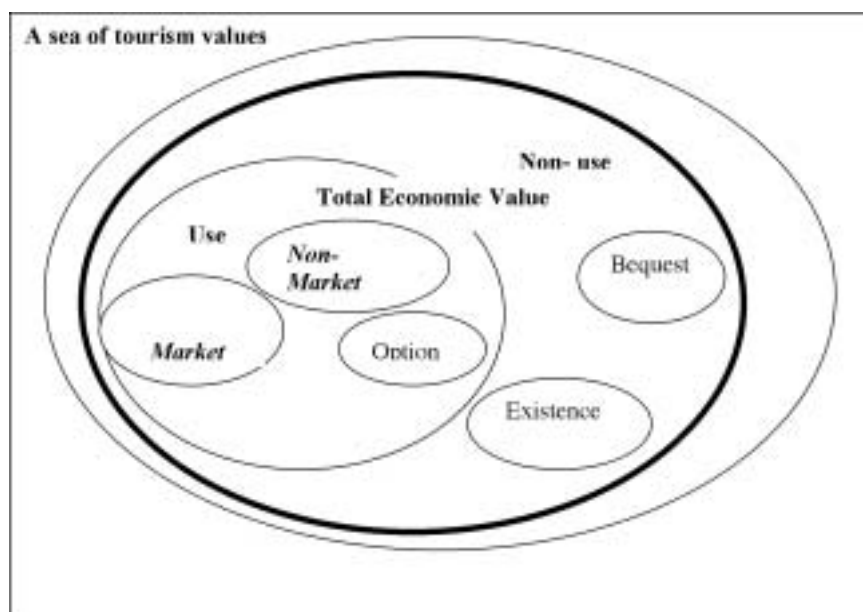


Figure 1: Economic Values associated with Recreation after Broadhurst and Harrop (2000)¹⁰

the social and economic impacts of forestry on rural development in the Republic of Ireland, Northern Ireland and Scotland. In this study forest recreation was valued using both travel cost method (TCM) and contingent valuation technique (CVT) approaches. The Bacon Report¹³ in 2004, extrapolating from the earlier work, determined that the contribution of forest recreation to the national well-being was in the order of €37 million per annum and concluded that when the value of recreation was included the investment in forestry by the state made economic sense.

COILLTE AND IRISH SPORTS COUNCIL STUDY¹⁴

To address the valuation issue Coillte and the Irish Sports Council commissioned Fitzpatrick and Associates to undertake a study to examine the economic contribution that forest recreation areas and trails make in terms of non-market benefits and to assess their economic impact on the tourism sector. From a Coillte perspective the study objective involved:

- A valuation of the economic value to users based on:
 - a reliable estimate of the present level of usage of its estate by all recreational users;
 - a measure of the average value of a recreation visit to users;

- Methods for calculating this on an ongoing basis;
- As the forest is also a major backdrop and contributes significantly to the tourism industry in the Republic of Ireland a measure of the economic value of such a contribution was required. Coillte sought to establish the value of forest recreation to the overall tourism industry.

RESEARCH METHOD

The research involved extensive primary research work, through both postal and on-site surveys and was conducted in Spring 2005. A questionnaire was sent to 3,000 households in Ireland and 441 questionnaires were returned, a 15% response rate. Some 636 trail and forest users were interviewed on-site at 15 locations throughout the country (See Table 1). This primary research was supplemented by a review of existing literature, three international comparative case studies, and consultations with key stakeholders.

The site selection used a stratified selection based on population spread distributed across the country ranging from peri urban forest sites to remote forest recreation areas. Table 1 shows the sites visited and the number of interviews completed at each site. A sufficient sample size was achieved at 12 of the 15 sites. The sites visited

reflect the following factors: high levels of overlap of forest and trail sites; geographical spread; range of activities typically undertaken. The reasons for lack of success at three of the sites include poor weather on successive visits; the seasonality of visitor numbers at some of the more remote sites; and multiple site access points resulting in difficulties in locating trail users. In total 636 trail users were interviewed.

TABLE 1. NUMBER OF SURVEYS RETURNED BY SITE LOCATION

Site	Number
Kilmashogue, Co. Dublin	55
Crone Woods, Co. Wicklow	60
Balinastoe Wood, Luggala, Co. Wicklow	64
Pol an Eas Wood, Glendalough, Co. Wicklow	63
The Royal Canal, Leixlip, Co. Kildare	68
Slieve Bloom Mountains, Co. Laois	2
Portumna Forest, Co Galway	60
Lough Key Forest Park, Co, Roscommon	28
Slish Woods, Co. Sligo	54
Torc Wood, Killarney	43
Gougane Barra Forest Park, Co. Cork	43
The Vee Gap, Clogheen, Co. Tipperary	3
Greenwood, Ballyhoura	46
Ballycuggeran Wood, East Clare Co. Clare	47
Total Number of Surveys Completed	636

VALUE OF A RECREATION VISIT

The survey team requested each participant to complete questionnaire giving background information on socio economic and demographic and other criteria. Willingness To Pay (WTP) for the visit was chosen as the method to elicit the value of a recreation visit. Users were also asked to select between a visit to the forest area and other recreation opportunities of a known commercial value. Respondents were asked to rate, for example, a visit to the forest as being of “lesser value, equal value or greater value than a game of golf”. This Costless Choice method was used as respondents can sometimes employ a bidding strategy when responding to a willingness to pay

TABLE 2 WTP VALUES BY SITE

	Average €
Kilmashogue, Co. Dublin	8
Crone Woods, Co. Wick low	5
Balinastoe, Luggala, Co. Wicklow	4
Pol an Eas, Glendalough, Co. Wicklow	6
The Royal Canal, Leixlip, Co. Kildare	7
Portumna Forest, Co Galway	5
Lough Key Forest Park, Co, Roscommon	8
Slish Woods, Co. Sligo	3
Killarney National Park, Co. Kerry	4
Gougane Barra Forest Park, Co. Cork	6
Greenwood, Ballyhoura	7
Ballycuggeran, East Clare Co. Clare	5

question. Table 2 shows the WTP values for each individual site.

Based on our on-site survey, the typical value placed by a user on a visit to a trail or forest site was €5.42.

As mentioned above, given the free nature of forest recreation there can be a tendency for some respondents to respond with a Zero value – using a bidding strategy. These zero responses were validated by using comparisons (the Costless Choice Method) with other activities which have a known market value, i.e. a charge. The value of the choices ranged for approximately €5.00 to over €20. The response rates are detailed in Table 3.

From this it is possible to see that the majority (75 – 85%) of those who responded with a zero value to the Willingness To Pay question rated the visit as greater than or equal to other recreation activities with a known value of over €5.00.

The team were confident that the non-market value of a visit was therefore €5.42.

FREQUENCY AND NUMBER OF VISITS

Calculating the number of visits to forests is difficult given the dispersed nature of the forest resource and the usage pattern. The survey team asked each respondent to indicate the level of usage

TABLE 3 COMPARISONS BETWEEN VALUE FROM SITE VISIT AND OTHER ACTIVITIES (LESS THAN MEAN VALUE RESPONDENTS)

Analysis of answers provided by respondents who provided a WTP value of less than €5 (mean value)	Visit of greater value	Visit of lesser value	Visit of same value
	%	%	%
Visit to Gym/leisure centre	60	20	20
Game of golf	53	24	23
Indoor racquet sport e.g. squash	60	24	15
Visit to swimming pool	53	16	31
Other activity	42	28	29
Trip to cinema	63	15	21
Trip to zoo	56	18	26
Trip to museum or gallery	56	14	29

per annum. The average number of annual visits ranges from 18 in Luggala, Co. Wicklow to 103 at Ballycuggeran, Co. Clare (See Table 4). The overall average for the 12 sites (with sufficient sample size) was found to be over 50. The typical visitor therefore visits the sites about once a week. The frequency of visits related to the type of site and its proximity to major population centres. Some of the sites with lower average visit numbers per interviewee are less likely to have a significant population in the immediate vicinity. Sites such as Luggala and Gougane Barra are more likely to be visited in the context of a family day out or weekend visit to a trail.

However this information was not deemed sufficiently robust to give a satisfactory indication of the total level of usage. The consultants decided to err on the side of caution and take the usage per adult head of population from the UK day visitor survey which gave a usage pattern of 6 visits per annum per head of adult population. This gave an annual usage of Irish forests as approximately 18million per annum.

THE TOTAL NON MARKET VALUE

Using the value per visit (€5.42) and the number of visits (18million) it is possible to estimate the total non- market value of forest recreation on the Coillte estate, in effect the uncollected entrance and usage revenue, is therefore of the order of €97 million per annum.

TABLE 4. AVERAGE NUMBER OF VISITS PER INTERVIEWEE BY SITE

Site	Average Visits
Kilmashogue, Co. Dublin	54
Crone Woods, Co. Wicklow	30
Balinastoe, Luggala, Co. Wicklow	18
Pol an Eas, Glendalough, Co. Wicklow	43
Portumna Forest, Co Galway	81
Lough Key Forest Park, Co, Roscommon	30
Slish Woods, Co. Sligo	90
Torc Wood, Killarney National Park, Co. Kerry	43
Gougane Barra Forest Park, Co. Cork	24
Greenwood, Ballyhoura	54
Ballycuggeran, East Clare Co. Clare	103

GENERATING ECONOMIC ACTIVITY IN RURAL COMMUNITIES

Forest recreation provides a backdrop to much rural tourism initiatives. Forest recreation areas can make a significant contribution to local economies through recreation generated economic activity. Coillte is currently developing a number of pieces of recreation infrastructure under the National Development Plan 2000 – 2006 designed to support rural tourism and economic development. These projects include commercially focused developments such as the Lough Key Forest Park re-development and the more traditional free forest type recreation such as the mountain bike development in the Ballyhoura Mountains.

EXAMPLE -BALLYHOURA MOUNTAIN BIKE PARK

The Forestry Commission Wales have shown that recreation facilities such mountain biking centres “can lead to new visitor spending in the local economy, and helping to support economic and business development in some of the more remote rural parts of the country”¹⁵. Coillte is working in partnership with the local community, the local authorities and Failte Ireland to develop a state of the art mountain bike facility in the Ballyhoura Mountains of East Limerick/North Cork. The park will provide over 80Km of sustainable trail and the associated car parking, visitor centre and trail facilities. Like North Wales this development is seen as considerably adding to the attractiveness of this area as a tourism destination and supporting rural communities and national spatial distribution of tourism.

SPENDING PATTERNS

Bergin and O’Rathaille¹⁶ carried out a study of recreation in the Irish uplands estimating expenditure based on the summer of 1997. The study estimated a total expenditure per trip for overseas visitors of €420 compared to €94 for domestic Irish visitors. Economic activity can some times however be over valued with the use of multipliers. In Coillte/Irish Sports Council study we wished to ascertain the actual level of economic activity generated by visits to forest sites. Interviewees (to sites) were asked to indicate their level of spending on a range of goods and services associated with the trip.

Approximately one third of all interviewees spend money in local businesses as part of their visit. The most common form of expenditure is on food, with 34% of interviewees likely to purchase food in a local pub, restaurant, café or shop. The average expenditure of these interviewees was found to be €22 (Table 5). While this largely relates to expenditure by day-trippers it also includes expenditure by those staying overnight and would therefore involve the purchase of more than one meal.

About 10% of interviewees spend money on drink in local pubs. The average level of spend was

TABLE 5 AVERAGE EXPENDITURE BY CATEGORY

	Average Spend €	% Total Visitors
Food in local pub, restaurant, café or shop	22	34
Drinks in local pub	12	11
Accommodation	64	5
Non-food items in local craft or other shops	36	5
Any other items	39	2
Average Visitor Spend	14.91	

found to be €12 per person. While only 5% of interviewees spent money on local accommodation, the average spend per over-night visitor was €64. This represents an important source of income for local B&Bs and farmhouse accommodation businesses that have been experiencing a decline in demand in recent years. 5% of interviewees also spend money on local crafts or other non-food items while 2% of interviewees spend money on other items. The overall average direct economic contribution i.e. expenditure by domestic interviewees was found to be €14.91.

Using the figure of 18 million visits per annum (domestic Irish visitors) the study estimates that the direct economic impact of forest recreation by Irish residents is of the order of €268 million.

COMMERCIAL MODELS – CASE STUDIES

As seen in the economic model above (Broadhurst and Harrop) market values are also an important part of the total economic mix. Market values can be tapped by commercially focused landowners delivering a marketable service in an otherwise non-market sector. Two case studies are presented here to demonstrate how forest recreation can be delivered in a commercial fashion.

LOUGH KEY FOREST PARK

Lough Key forest park is situated on the Upper Shannon River and was developed as a forest park

in the late 1960s early 1970s. The park covers some 350 ha. of open parkland, broadleaf woodland, lake shore and Special Areas of Conservation. In the last 15 years visits to the park declined and as a result revenue and subsequently facilities suffered.

Coillte, the owner, was faced with a major annual deficit and a local community critical of the lack of investment as it impacted on the tourism potential of the hinterland. Coillte was therefore faced with a dilemma – how do we manage such a resource in a commercially focused environment?

Roscommon County Council, the local authority, identified Lough Key as a key development area for tourism in their County Tourism Strategy. However they had no access to land around the lake and therefore were limited in their ability to turn strategic objectives into action. How could they access the resource to develop the tourism potential of the area?

The solution was an innovative approach that would deliver a commercial result for both partners while delivering much needed tourism resources to this rural community. A joint venture company, Moylurg Rockingham Limited, an equal partnership between Coillte and Roscommon County Council, was established to develop and manage the most economically viable elements of the park, a core area of 44has. The company has been successful in securing 75% grant aid from the national tourism authority, Fáilte Ireland, under the National Development Plan 2000 - 2006 and has raised €2.3 million as matching funding for the 8.0 million redevelopment programme.

The park is currently being redeveloped and will include:

- The Lough Key Experience – a circular trail which brings together the existing tunnels and a tree top walk in an innovate and iconic mix which will attract a cross section of visitors.
- The Adventure House – an indoor adventure area designed to give a year round weather independent recreation area and attract users in the 15 to 35 year bracket.
- A welcome centre with catering, retail and rest facilities
- The pay to play zone – an outdoor play area designed for the 2 to 12 year old market

- A range of traditional forest recreation activities in the surrounding park.

The area will also include the recently redeveloped Caravan and Camping Park and car parking for over 300 vehicles.

This development will be managed on a commercial basis by a tourism/recreation professional and is expected to be making a positive contribution to the partnership in five years.

This development will contribute significantly to the economic redevelopment of the predominantly rural area and already a major resort type development is at planning stage on adjacent lands.

Coillte believes that this redevelopment provides a model for similar forest park developments both in Ireland and abroad, marrying as it does land owners, with commercial objectives, and organisations such as the local authorities, who have other objectives including the economic and social development of rural communities.

MWEELMORE LODGE, MOURNES, NORTHERN IRELAND AND CRONIN'S COTTAGE, BEAUFORT CO. KERRY

Models applicable to smaller scale owners exist already in Ireland where landowners have been able to tap into the existing commercial recreation potential of the countryside. Mweelmore Lodge and Cronin's Cottage provide commercially operated recreational facilities albeit not in a forest environment.

Mweelmore is a small mountain farm now catering for visitors providing secure paid parking, café, camping, toilets and showers and access to the mountains. Mweelmore makes an annual operating profit in the region of Stg.£15,000 and contributes significantly to employment in the local community. Cronin's Cottage is currently being upgraded to provide similar services for hill walkers and climbers and provides a small but regular income which subsidises life on the rural upland farm.

As outlined earlier, access to the countryside is a major issue of contention in Ireland and there is a dearth of access related facilities, car parks, access routes, changing facilities etc., outside those provided by Coillte and the NPWS. Forests, both public and private, often provide a valuable link between county roads and open lands, rivers or lakes. The “geography” of these sites could be utilised and with the correct infrastructure, car parking, café, toilets, access routes etc., to provide a valuable income for forest owners without impacting unduly on the forest resource.

CONCLUSION - ECONOMIC VALUE

It is evident that forest based recreation has a significant part to play in contributing to national well being and to rural development through the generation of economic activity and also in delivering a very valuable service to the citizens of Ireland through outdoor recreation provision.

The recurring issue, however, is how do we ensure that the benefits that accrue to society – social, cultural, health and economic activity – are not a cost and burden for the forest land owner, whether large or small. This study demonstrates that forest recreation on Coillte land delivers significant values to society on a variety of levels, generating €97 million of non-market benefits and over €268 million in economic activity. Similarly I believe that private forest owners can also contribute to delivering these values. In world terms the forest estate in Ireland can be described as small scale in the block sizes yet it provides a hugely valuable recreation resource delivering c220€ per ha per annum.

The European Union is moving away from the deliverables of the last thirty years and is expecting land owners to deliver more of the non-market benefits for an increasingly urban Europe. From an equitable perspective it is unreasonable to expect land owners to provide these services, often at a cost, without the transfer of funds to distribute the benefits.

Forest owners will deliver benefits where incentives are available that make economic sense. As forest management moves to the delivery of a

range of services a new look is required at the non-market benefits.

Notes

- 1 Coillte Recreation Policy - Healthy Forests, Healthy Nation 2005 Coillte, Dublin Road, Newtownmountkennedy, Co Wicklow. (Available on www.Coillte.ie)
- 2 National Parks and Wildlife Service – Personal Communication
- 3 Waterways Ireland is an all Ireland organisation that manages the major waterway systems in Northern Ireland and the Republic.
- 4 Strategic development plan for Irelands walking tourism product 2003 – 2006, Failte Ireland, Dublin.
- 5 Recreational Trail Audit 2005, Coillte Consult, Newtownmountkennedy, County Wicklow.
- 6 The Forestry Act 1988
- 7 Current trail upgrading costs can range from circa €20 to €100 per m of forest trail.
- 8 The Metsahallitus (the Finnish State forest company) receives in the order of €25 million for the provision of a range non-market benefits including recreation.
- 9 The Forestry Commission Scotland receives stg £1 for each forest visit. Pers. Comm. Max Hislop Social Research Unit, Forestry Commission.
- 10 Broadhurst and Harrop (2000) Forest tourism: putting policy into practice in the Forestry Commission.
- 11 Murphy, W.M (1984). An Examination of Methods for the Economic Evaluation of Forest Recreation. Unpublished M.Agr.Sc. thesis. University College Dublin.
- 12 Ni Dhubháin, A. Gardiner, J., Davies, J. Hutchinson, W.G. Chilton, S., Thomson, K, Psaltopoulos, D, and Anderson, C. (1994). The Socio-Economic Impacts of Afforestation on Rural Development. Final Report, Contract No. 80001-0008, CAMAR. European Community.

- 13 Bacon, P 2004 A review and appraisal of Ireland's Forestry Development Strategy. Government Publications Office, Dublin 2.
- 14 Fitzpatrick and Associates. (2005). The economic value of trails and forest recreation in Ireland. Coillte and Irish Sports Council. Fitzpatrick and Associates, Economic Consultants, Ladd Lane, Dublin 2.
- 15 FORESTRY COMMISSION WALES, STRATEGIC ACTION PLAN FOR MOUNTAIN BIKING 2005-2007 - Purpose, Drivers, Objectives and Priorities.
- 16 Bergin, Jack & Milo O'Rathaille – Recreation in the Irish Uplands, Waterford Institute of Technology