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**A contingent valuation assessment of recreational demand for walking on farm
commonage in the Republic of Ireland.**

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Abstract

This paper measures willingness to pay (WTP) for public access and trail improvements on commonage farmland for recreational walking in upland and lowland areas of Connemara region in the West of Ireland using the Contingent Valuation Method (CVM). Common to both upland and lowland commonage sites was the much higher ranking for infrastructural features by those WTP for scenario implementation compared to those preferring the status quo. Results for those expressing a positive WTP reveal a median willingness to pay (MWTP) for formal access with improved trail infrastructure of €12.22 for the lowlands compared with €9.08 for the uplands.

Keywords: Commonage, willingness to pay, contingent valuation, recreation, walking.

1. Introduction

In recent years, there has been an increasing research interest in the non-market benefits of land based recreational amenities (Pruckner, 1995; Bateman et al., 1996; Kline and Wichelns, 1996; Fleischer and Tsur, 2000; Crabtree et al., 2000; Smailes and Smith, 2001; Hanley et al., 2002; Bennett et al., 2003; del Saz Salazar and Menéndez, 2007). This interest is no more evident than in the Republic of Ireland where in the last decade the demand for rural recreation has increased as the population has become increasingly urbanised. Increased affluence, mobility and changing values have also brought new demands with respect to landscape, conservation, heritage and recreation, with a greater emphasis on consumption demands for goods and services in rural areas. The consumer driven interest in the use of Irish farmland for recreational pursuits has prompted policymakers and academic researchers to investigate the demand for rural recreation (Hynes et al., 2007; Mill et al., 2007). It is recognized that this activity has the potential to generate significant tourism revenue for non-urban land of marginal economic value and is increasingly proposed as a vehicle for rural and regional development (Moore and Barthlow, 1998; Lane, 1999; Vaughan et al., 2000; Failte-Ireland, 2005). Much of the

Republic of Ireland's commonage¹ farmland is located in remoter coastal, upland and mountainous regions which yield poor economic returns from agriculture yet are ideally suited to open air outdoor recreation activities (Buckley and van Rensburg, 2006). The exceptional recreation appeal along with increasing personal incomes and enhanced mobility has given rise to increased demands for a wide range of recreation activities including hill-walking, mountaineering, mountain biking, surfing and horse riding (Mountaineering Council of Ireland, 2005; Hynes and Hanley, 2006; Irish Canoe Union, 2006; Irish Sports Council, 2006). Despite its outstanding recreational appeal, public access to farmland in the Republic of Ireland for such activity is limited. It is dependent on by-product access such as access to public forests.

Whilst policy makers are aware of the economic opportunities associated with open-air outdoor recreation activities, rational public decision-making on financing the improvement of public access requires that these economic benefits should be clearly identified and valued. The maintenance of existing trails and the provision of new schemes for walking also depend on the supply of public funds, which must be justified to the public exchequer and the public at large. The costs of trail expenditure, as well as problems associated with funding and maintaining the waymarked ways by public authorities has focused attention on the benefits and costs of access.

In the literature it is taken as a given that decisions over access provision should be guided by allocative efficiency criteria and that the economic benefits should be clearly identified and valued (Hanley and Spash, 1993). To this end, this study addresses the measurement of non-market recreational values associated with walking on farm commonage using Contingent Valuation Methodology (CVM). CVM is a well established technique for valuing non-market benefits which has been widely

¹ Commonage refers to land on which two or more farmers have grazing rights (Laffery et al., 1999). Under common law, land held in commonage is seen as a tenancy in common. Each tenant holds an undivided share in the property and has a distinct and separate interest in the property. The ownership is divided into notional shares, rather like shares in a company. Commonage is not physically divided so no one person owns any particular part of the property. In a sense it is communally owned and operated and third parties must treat the co-owners as a single unit for transactions in respect of the land (Pearce and Mee, 2000)

documented in the economics literature (Hanemann, 1984; Mitchell and Carson, 1989; Arrow et al., 1993; Willis and Garrod, 1993; Hanemann, 1994; Portney, 1994).

The research questions that we aim to address in this study are:

- (i) Determine which trail attributes and facilities are important to respondents;
- (ii) Establish whether respondents are willing-to-pay for an access agreement and trail facilities;
- (iii) Establish if respondents have a preference for lowland or upland commonage walks.

The remainder of the paper is organised as follows: section 2 discusses the countryside access situation in the Republic of Ireland. Section 3 gives some background to the survey of visitors to the Irish commonage sites and discusses the execution of the survey. Following this, section 4 outlines the contingent valuation method and its application to the valuation of non-market environmental public goods. The empirical estimation procedure is also reviewed in section 4. Results of the CVM analysis are presented in section 5 and finally section 6 concludes with a discussion on the economic and policy implications of the study findings and some recommendations for further research.

2. The countryside access situation in the Republic of Ireland

The subject of promoting access to the Irish countryside involves a number of complex issues that affect the rural economy and its population. Tourism development is important particularly in areas like the Irish uplands where other opportunities for growth are limited. The number of overseas participants in hiking and walking amounted to 168,000 during 2003 and this represented the main outdoor activity undertaken by international tourists (Failte-Ireland, 2004). Bergin & O' Rathaille (1999) in their all island report (Republic of Ireland and Northern Ireland) on walking activities, estimated that, in 1997, 90,000 visitors took part in outdoor walking activities in the Irish uplands (66,600 of whom were from Ireland and the remainder were from abroad). They

estimated that total expenditure on travel, food items, entry fees, accommodation and expenditure on walking equipment amounted to approximately £115 million (€146 million) during 1997. A report commissioned by the Irish Sports Council and Coillte (Forestry Service) to investigate the economic benefits associated with recreational trails and forest recreation in Ireland indicated that 13 per cent of the adult population (403,000) currently use developed recreational trails in Ireland on a regular basis (Fitzpatrick Associates, 2005). The total number of annual domestic trail visits undertaken by Irish residents was estimated to be 17.5 million. The average level of expenditure by those accessing trails was found to be €14.91 per person (Fitzpatrick Associates, 2005).

All land in the Republic of Ireland is owned either by private individuals or state bodies and recreational users do not have a de-facto legal right of entry (Mountaineering Council of Ireland, 2003). In the Republic of Ireland, there are very few designated public rights of way and areas developed specifically for providing recreational access are very limited (Flegg, 2004). A right to roam or an everyman's right of access which is applicable in other EU countries does not prevail. In contrast, access to farm and unenclosed commonage land for walking and mountaineering is in general unregulated and usually requires no payment by the recreationalist. This has arisen principally due to: low population density; marginal economic land value; difficulty of property right enforcement and consequent permissive attitude of many landowners.

There is some evidence that landowner welfare could be negatively affected by the activities of the general public (Denman, 1978; Crabtree and Chalmers, 1994). In the main this is due to the detrimental effects on the business activities of farms (lost output or increased costs), but there are also thought to be minor impacts in terms of a reduction in the amenity and aesthetic qualities of a property. Millward (1996) found there is genuine concern among landowners that greater public access for walking will lead to adverse outcomes such as: greater costs arising from higher insurance premiums, threat of being sued by the public due to accidents while on their land, threats to crops and livestock, increased workloads that lead to no meaningful return such as risk management

and reduced incomes from the sale of land that has been devalued as a result of public rights of way running through it. It is widely documented in the farming press and elsewhere that land managers regularly encountered problems with public access such as dogs not being kept under control, vandalism, theft, arson, litter, gates being left open, 'prying', and the compromising of conservation work (NFO System Three, 2001; Comhairle na Tuaithe, 2006). Increased access for recreation also has the potential to reduce the 'private' benefits derived from land ownership (Mulder et al., 2006; Campos et al., 2007).

In many instances landowners have prevented recreationalists infringing their property rights by denying access to private and commonage land. This has isolated walking clubs and their members who have voiced concerns that changing attitudes in landowner behaviour has increasingly restricted access rights (Keep Ireland Open, 2003). The problem has been compounded by the distinctive historic tradition of open access (by members of the public) to commonage land. Although this has instilled a strong perception of public access rights, the law concedes exclusive use to the landowners who own the commonage grazing rights (Wylie, 1997; Pearce and Mee, 2000). Any individual accessing commonage land, challenges the right to exclusive use, and may be expected by the landowner or shareholders to leave. Recreational access to commonage land is therefore not an enforceable right, and some landowners have displayed signs prohibiting trespassing on commonage. The Republic of Ireland is covered by walks which cross commonage land. Although many of these walks are documented in guidebooks and appear on tourist web sites they are not covered by access agreements with landowners and no one is responsible for their maintenance. This represents an unsatisfactory situation and serves as no basis for an economically sustainable tourist industry based on recreational walking.

Perhaps the most promising solution to facilitating access on private farmland and commonage are the waymarked ways. In 1978 the national Waymarked Ways Association of the Irish Sports Council was set up to establish way leave agreements throughout the Republic of Ireland. These way leave agreements are not statutory rights

of way, but operate on the basis on an informal agreement between the landowners, the local authority and the Irish Sports Council. Landowners are not compensated for access and the walks are managed and maintained by local authorities. At present 31 waymarked ways are in existence. These are estimated to account for 3,421 kilometres in total distance (Irish Sports Council, 2005). In 2004 the Minister for Community, Rural and Gaeltacht Affairs set up the countryside recreational council “Comhairle Na Tuaithe” (CnT). The role of this council is to examine the issues of access to the countryside, develop a countryside code and develop a countryside recreation strategy. Significant progress has been made on the latter two objectives (Comhairle na Tuaithe, 2006) but the problematic issue of access remains (O'Reilly, 2006). Ongoing negotiations indicate that farmers are not opposed in principle to access but have asked for compensation and expressed concerns as to who will be responsible for trail maintenance and management. Although negotiations are encouraging, no definitive agreements have been reached over access at the time of writing. In a recent study commissioned by Agri-aware² it was found that 84% of respondents (drawn from the general public in the Republic of Ireland) believe that the Government should intervene in order to introduce solutions for both landowners and users of the countryside with regard to land access issues. Of this number, a majority (77%) cited clearer legislation and provision for dedicated walkways as possible solutions. Also, almost half (48%) of those surveyed said they would be willing to pay a nominal charge for countryside access (Bogue, 2005). Clearly there is a need to measure public preferences and demand for recreational trails on farmland with greater precision. In what follows, our research reports on a survey of visitors which is used to investigate public preferences for two commonages in Connemara.

3. The Connemara walking survey

The case study area was the Connemara region. This is a remote district in the west of Ireland associated with County Galway. It is broadly used to describe all of County Galway west of Lough Corrib. Connemara is renowned as an Irish-speaking enclave or

² A charitable trust, established in 1996 "To Improve the Image and Understanding of Agriculture, Farming and the Food Industry amongst the General Public."

Gaeltacht with an outstanding scenic environment. Due to its rugged wild landscape the region is distinctly marginal in terms of traditional agricultural activities. Here tourism has long been promoted as the main strategy for regional development. Special interest activity tourism is recognised as a key development area by tourism authorities (Tourism Policy Review Group, 2003). Connemara with its combination of lakes, mountain ranges, bogs and coastline make it an ideal location for outdoor activity, particularly walking. It is recognised as having the natural resources to cater for all sections of the walking market (Dillon, 2001; Gibbons, 2004).

To advise on appropriate case study site selection a panel of experts was established³. In consultation with the panel and using the tourism and walking literature (Kay and Moxham, 1996; Curtis and Williams, 2004; Visit-Scotland, 2004) walking categories were identified. The panel also suggested a number of walking related attributes which should be tested. Research objectives were to determine if respondents have a preference for lowland or upland commonage walks and to determine whether there is a different WTP for these two quite different trail types. To help answer these research objectives a number of informal commonage associated walks were identified in each category (upland and lowland) across Connemara using published guidebooks and the expert panel (Corcoran, 1997; Simms and Whilde, 1997; Lynam, 1998; Dillon, 2001; Gibbons, 2004). The panel then selected the most appropriate sites for examination in each category. The two walking routes chosen for investigation were the Glencoaghan Horseshoe (upland site) and the Connemara National Park to Lettergesh Beach (lowland site).

The Glencoaghan Horseshoe is a rugged high altitude walk that loops through the Twelve Bens mountain range in the heart of Connemara. The route takes in 6 mountain peaks, five of which are over 600 meters. It is approximately 16 kilometres long and takes between 8-9 hours to complete. The route is characterised by mountain peaks of quartzite rock with little bog or vegetation growing on it. It is generally only undertaken

³ Keane, M. Professor of Economics, National University of Ireland, Galway, Specialist in Tourism Economics.
Tubridy, M. Chairperson of Irish upland forum and ecologist.
Gibbons, M. Connemara walking tour operator and archaeologist.

in its entirety by experienced hill walkers. It is regarded as probably the premier horseshoe walk in the Republic of Ireland. Almost the entire walk is over commonage land.

The Connemara National Park to Lettergesh Beach route is predominantly a lowland walk. The proposed route would officially link 3 of Connemara's main tourist attractions: the Connemara National Park, Kylemore Abbey and Lettergesh beach in a linear trail. Connemara National Park is a state owned park, Kylemore Abbey is an estate run by the religious order of the Benedictine nuns and the final section of the walk crosses commonage land to link up with one of Connemara's main beaches at Lettergesh.

A survey of visitors was undertaken at these two sites. A pilot study was conducted in July 2005 over 14 days. The full survey took place during the months of July – October 2005. Some additional surveying took place on the upland site in the summer of 2006. A total of 141 pilot surveys were collected during the pilot phase. As recommended in the literature (Boyle et al., 1998; Langford et al., 1998) an open-ended bid design was used in the pilot. This was followed by a single bounded dichotomous choice design in the main survey. Alternatives to this approach have been debated in the literature. However, as long as the bids are selected with care, and the sample size is not too small, there is no conclusive evidence that the alternatives have any real advantage (Langford et al., 1998; Scarpa and Bateman, 2000). The use of pilot data to choose bids in the main survey was informed by a number of studies (Kanninen, 1995; Boyle et al., 1998; Creel, 1998; Hanemann and Kanninen, 1998; Langford et al., 1998).

Using data from the pilot survey and following the procedures adopted by Boyle et al., (1998) bids ranging between €2 and €15 were identified. In carrying out the survey each interviewee was told “The Government is considering the promotion of the trail in question as described above. There are two options: **the trail** as it is without an access agreement (status quo) and **the trail** with assured public access, insurance⁴ and recreational facilities under a management agreement (formal waymarked way scenario).

The interviews were conducted on site in full view of the walk that was being referred to in the surveys. Respondents were shown two showcards, one illustrating the walk without an access agreement (status quo) and one illustrating the walk with assured public access and recreational facilities under a management agreement (formal waymarked way). Respondents were not given the option to choose an access agreement with assured access that did not include trail facilities. Respondents were also shown a map of the area in question and details for each option were read out by the interviewer. Immediately after being presented with this information, respondents were asked: 'Which of these options do you prefer?' Respondents were also asked to explain why they chose their preferred option. Those who preferred the **status quo** were asked a series of questions covering general information including household characteristics, their attitudes to the environment, membership of walking organizations and participation in walking activities. These respondents were not asked about WTP. Respondents who preferred the **waymarked trail** with access rights were asked about WTP before going on to the same series of general questions.

The willingness to pay questioning took the following form. Respondents were told: "This trail will impose additional costs on the Irish Sports Council, local authority and local landowners compared to the status quo of informal access. This cost could be paid for by the general public through increased annual taxation⁵ so it is important to find out how much if anything, you would be willing to pay to have the x site developed as an official waymarked way instead of the informal agreement. Bear in mind, however, your total annual budget, the amount you can allocate to recreational pursuits and finally how much of this you can afford to spend on this x walk. Remember also that developing the x

⁴ In the case of waymarked ways promoted by a local authority and approved by the National Waymarked Ways Advisory Committee (NWWAC) of the Irish Sports Council, indemnity is given through an insurance policy with the Irish Public Bodies Mutual Insurances Limited (IPBM). When a new way is being created, the names and addresses of all owners and occupiers affected are given to IPBM and form part of the policy. The indemnity is valid whether the walker is actually on the way or has strayed off it.

⁵ Taxation was chosen as it was the only mandatory vehicle that could potentially apply to all potential users.

walk as a formal waymarked way does not mean that it becomes a permanent right of way as the agreement only lasts for five years. Remember also that this agreement just covers the x walk and it does not include other walks in the Republic of Ireland. Also bear in mind that paying too much for this trail may mean that you cannot afford other worthwhile recreation schemes – for example there are other trails that might be developed”.

All respondents who preferred the site with secured access rights (formal waymarked way) were then asked: “Are you willing to pay something toward the extra cost in order to have the site developed and maintained as a formal waymarked way for five years rather than the status quo of informal access? Respondents answering “No” to this question were then asked which of several statements best described why they were not willing to pay anything. Those who answered this question in the affirmative were then asked “Are you willing to pay €X in increased annual taxation to ensure that the site is established and maintained as a waymarked way for a period of five years?”

Using data from the pilot survey and aided by discussion in the literature (as discussed previously) bids of €2, €4, €8, €12 and €15 were chosen, assigned equally and randomly across respondents. Thus, contingent valuation was used to estimate the value of a marginal change in moving from the status quo scenario to a more formally developed waymarked way walk on the site in question. In seeking to minimize respondents’ expression of preferences not truly reflecting their willingness to pay on account of ‘embedding’, respondents were reminded that this was one of a number of walks which might be developed in the area. To minimize hypothetical bias respondents were reminded also about their budget - what they could afford to spend just on this site and particularly what they were actually paying for - the characteristics and facilities of the walk. Respondents were told that the Irish Sports Council was using this information in order to decide which trail types to develop. They were told also that their answers might actually result in increased taxation payments. Where a zero incremental willingness to pay was tendered, a reason was sought.

A total of 710 surveys were carried out across the two sites. Individuals were asked about their WTP at each of the five prices at both sites. A total of 474 individuals were asked the WTP question (the remainder preferred the status quo). To avoid bias, every other person was interviewed. Each interview lasted approximately 15 minutes and followed a set format. Interviewers were rotated around the sites each day.

4. Theoretical framework

The elicitation format chosen in this study is the dichotomous choice format. This means that respondents were asked whether they were willing or not (yes/no answer) to pay a pre-determined amount of contribution to establish a formal waymarked way. The price was randomly assigned among respondents so as to generate price variation. The price range used in this study was based on the responses to the pilot study which utilised the open-ended elicitation format (Haab and McConnell, 2002) discussed in the previous section. The random utility model (Hanemann, 1984) was assumed in this study in a form that is additively separable in deterministic and stochastic preferences as:

$$v_i(y_j, z_j, \varepsilon_{ij}) = v_i(y_j, z_j) + \varepsilon_{ij} \quad (1)$$

where y_j represents discretionary income, z_j is an m -dimensional vector of socio-economic variables, ε_{ij} is a stochastic error term and $(i = 1)$ represents the waymarked way route implemented and $(i = 0)$, the status quo. Assuming linear utility in the deterministic part yields the indirect utility function:

$$v_{ij}(y_j) = \alpha_i z_j + \beta_i(y_j) \quad (2)$$

where α is an m -dimensional vector of parameters such that $\alpha_i z_j = \sum_{k=1}^m \alpha_{ik} z_{jk}$ and β_i represents the bid parameter. If the CV question requires the respondent to choose between the proposed waymarked walking route at the required payment P ($i = 1$) and

the current state ($i = 0$), then the change in deterministic utility with the CV state (“yes” response) can be expressed as:

$$v_{1j} - v_{0j} = (\alpha_1 - \alpha_0)z_j + \beta_1(y_j - P_j) + \beta_0 y_j \quad (3)$$

Equation (3) shows that the respondent will answer yes if his utility deriving from the proposed waymarked way (v_{1j}) and paying the price (P) is higher than not having improved walking route facilities (v_{0j}) and not paying the price ($P=0$). Assuming that the marginal utility of income is unaffected between the non-CV and the CV states so that $\beta_1 = \beta_0$, then difference in utility will be $v_{1j} - v_{0j} = \alpha z_j - \beta P_j$ where $\alpha = \alpha_1 - \alpha_0$ and $\alpha z_j = \sum_{k=1}^m \alpha_k z_{jk}$. Therefore the probability of a ‘yes’ response is:

$$\Pr(\text{yes}_j) = \Pr(\alpha z_j - \beta P_j + \varepsilon_j > 0) \quad (4)$$

To estimate the parameters of the deterministic component of the utility function, the nature of the stochastic terms should be specified. When the response to the bid question is expected to be binary in nature i.e. ‘yes’ or ‘no’, then it is appropriate to assume a logistic distribution of the stochastic component of the utility function with a mean of 0. If the distribution of the stochastic error term ε is logistic, the logit model can be used for the estimation. Hanemann (1984) shows that if $v_i(y_j, z_j, \varepsilon_{ij})$ is linearly specified, then the probability of the respondent saying yes can be expressed with the dependent variable as the log-odds ratio of WTP as below:

$$\text{Log} \left[\frac{\Pr(\text{yes}_j)}{1 - \Pr(\text{yes}_j)} \right] = \beta_0 - \beta_1 P_j + \sum_{k=1}^m \beta_k z_k \quad (5)$$

Parameters β_0 , β_1 , β_k ($k=1, \dots, m$) will be estimated parametrically. The mean or median maximum WTP for establishing a waymarked way can then be calculated. The mean WTP can be estimated as (Hanemann, 1989):

$$Mean(WTP) = \ln((1 + \exp(\hat{\beta}_0 + \sum_{k=1}^m \hat{\beta}_k \bar{z}_k)) / (-\hat{\beta}_1)) \quad (6)$$

where $\hat{\beta}_1$ is the estimated value of the coefficient of the bid, $\hat{\beta}_0$ is the constant term, and $\sum_{k=1}^m \hat{\beta}_k \bar{z}_k$ are the other variables in the model where $\hat{\beta}_k$ represent the coefficient and \bar{z}_k is the mean.

However, the median WTP estimate is generally the preferred welfare measure because it is less sensitive than the mean WTP estimate to extreme willingness-to pay values and data errors (Hanemann, 1984). Median willingness to pay (MWTP) is the price at which the probabilities of answering ‘yes’ or ‘no’ to the willing to pay question are equal, i.e. $\Pr(\text{yes}) = \Pr(\text{no}) = 0.5$. Thereby, making the dependent variable $\ln(\Pr/(1 - \Pr)) = 0$ since the natural logarithm of 1 equals zero. MWTP is thus the price at which the estimated regression equation equals zero, given appropriate values of the other explanatory variables (the mean values are generally used). The median WTP can be estimated as:

$$Median(WTP) = \exp(\hat{\beta}_0 + \sum_{k=1}^m \hat{\beta}_k \bar{z}_k) / (-\hat{\beta}_1) \quad (7)$$

5. Results

5.1 Attribute analysis

Before examining the walking related attributes as explanatory variables in the estimation of the Median Willingness to Pay (MWTP), site attributes were examined in their own right. Two important aims of the study were to identify who is actually willing-to-pay for the access agreement and site facilities plus identify which attributes are important to respondents. This section examines the preferred attributes associated with those respondents who answered the willingness-to-pay question in the affirmative.

It was found that there are systematic variations between those who are willing to pay for the waymarked way scenario and those who prefer the status quo to remain. To illustrate the differences, respondents were partitioned into two groups. The first group was comprised of “payers” – those who were willing to pay for the waymarked way scenario (answered yes to the bid price offered). The second group were referred to as the “status quo group” – those who did not want the formal waymarked way scenario. The groups contained 162 and 140 respondents respectively for the lowland walk and 69 and 87 respondents, respectively for the uplands walk. Attributes were examined under three main headings: landscape, biodiversity and trail facilities / features. The respondents were asked to indicate by circling the appropriate number how important each of the attributes were to them personally. The numbers and descriptors offered were: unimportant, neither important / unimportant, somewhat important, very important and most important. On the scale of 1 to 5, 1 denoted unimportant and 5 was most important.

5.1.1 Attribute analysis on lowland site: Landscape attributes which were put to respondents included valleys, hills, forests, lakes / coastline. On the lowland site generally all landscape scores (except valleys) lie between 3 and 4, i.e. between ‘somewhat important’ and ‘very important’ as illustrated in Figure 1. The status quo group placed a greater level of importance on walking over hills and through forestry than the payers as seen by Figure 1.

<Figure 1: Mean attribute importance scores for status quo and payer groups on the lowland site>

However, this difference was not statistically significant. The status quo group also placed a higher level of importance on biodiversity such as wild animals, birds and wild flowers compared to the payers group. Importance scores generally ranging from 3.5 to 4 compared to a range of 3 to 3.5 for the payers in terms of biodiversity attributes. This is in line with other results (de-briefing questions outlining why they preferred the status quo scenario) which show that the majority of this group preferred to walk in a more natural undeveloped environment. T-tests analysis confirms this impression as equality of means between the groups is rejected for birds, wild animals (5 per cent significance level), and wild flowers (1 per cent significance level).

An important research aim of the study was to explore which trail attributes and facilities are important to respondents. To this end, respondents were asked to indicate the importance of the presence of a trails infrastructure and facilities for their safety and enjoyment of a walk in the countryside. Attributes tested included stiles and footbridges, an information point, a map or guide, a trail, route signs, a car park, that the walk be looped, measures to control erosion and a guaranteed access agreement with the landowners. The payer group systematically placed a much higher level of importance on all these attributes. Mean importance scores for the payers generally ranged from 3 to 3.75 compared to 2.5 to 3.25 for the status quo group. T-tests for equality of means confirm this impression, with equality of means between the two groups decisively rejected at the 1 per cent significance level for all attributes except for map/guide on the lowland site.

5.1.2 Attribute analysis on upland site: On the upland site both the payer and the status quo groups indicated a score around 4 denoting 'very important' for the presence of hills as outlined in Figure 2. The other landscape features (valleys, forests, lakes / coast) generally scored between 2.5 and 3 for both groups (3=somewhat important).

There was also little difference between the two groups on landscape features as confirmed by t-test analysis. This pattern was repeated for presence of livestock and biodiversity features as attribute scores generally fell in a range between 2.5 and 3 and indicated no significant differences between groups. Again, as with the lowland site, the payer group placed a much greater level of importance on infrastructural features. The payers indicated a rating of around 3 for such features as information point, trail, car park, map /guide, signs, stiles & footbridges (3=somewhat important) compared to an average rating of 2 to 2.5 for the status quo group (2=neither important nor unimportant). T-tests for equality of means confirm this impression, with equality of means between the two groups decisively rejected at the 5 per cent significance levels for all attributes except looped walks, erosion measures and an access agreement as seen in Figure 2. However, it should be noted that (excluding hills) measures to control erosion and an access agreement with the landowners were the highest ranked attributes by both groups in absolute terms.

<Figure 2: Mean attribute importance scores for status quo and payer groups on the upland site>

Overall results indicate that excluding the preference for walking over hills (upland site) almost all landscape, biodiversity and infrastructural attributes received a higher ranking by those on the lowland site compared to their cohorts on the upland site.

5.2 WTP results

In calculating the parameter estimates for our CVM model the dichotomous choice format outlined in the previous section was followed. Two logistic regressions were run, one for each of the study sites. The analysis is restricted to those indicating a positive WTP. A relatively similar two-thirds majority across the lowland (68.6%) and upland (65.6%) sites favoured the proposed waymarked way scenario over the status quo. Of those favouring the waymarked way scenario 87 per cent on the lowland site and 74 per cent on the upland sites indicated that they are willing to contribute something towards

the cost of scenario implementation. A further 24 respondents on the lowland site and 11 on the upland site were excluded from the analysis for reasons of protest bidding. The WTP analysis was hence restricted to 242 on the lowland site and 113 on the upland site. This represents 54 per cent of the sample on the lowland site and 44 per cent on the upland site.

The variable price in Tables 1 and 2 is the bid price presented to respondents in the WTP question. The variable walking activity relates to importance of walking activity (from 1=one of my many outdoor activities to 4=my most important outdoor activity). The variable European is a nationality dummy variable (1=from mainland Europe, 0=not from mainland Europe). The variable Loop NB is a dummy variable where 1 indicates that a looped walk is ranked an important attribute. Finally the variable income relates to pre-tax income where 1 is less than €10,000 per year and 9 is €80,000 euros or over.

Table 1 indicates that respondents' WTP on the lowland walk was positively affected by higher incomes and greater levels of walking activity. These are in line with expectations and are consistent with economic theory. Factors that negatively affected WTP were higher prices, whether the respondents were European and whether they had a preference for looped walks. The higher the suggested price the less likely the individual was to respond positively to the WTP question. Those for mainland Europe were not generally open to paying for such a good as it was not the norm in their home country. They generally suggested it should be provided by government. Finally, the hypothetical walking scenario linked a walk in the Connemara National Park with commonage in a linear trail. Those who preferred looped walks indicated a negative WTP for this linear trail arrangement.

<Table 1: WTP logistic regression results for lowland walk (Connemara National Park to Lettergesh)>

Additional survey questions corresponding to the independent variables in Table 2 are as follows: variables Irish and walking altitude. The variable denoted "Irish" is a nationality

dummy where 1 indicates that the individual is from the Republic of Ireland. Walking altitude relates to altitude of walks most frequently undertaken (from 1= often over 600 meters to 4= normally under 200 meters).

Table 2 indicates that respondents' WTP on the uplands walk was positively affected by being an Irish national. Irish nationals seemed more aware of the problems associated with access to the uplands and were more responsive to formal access with trail improvements. The higher the proposed price offered to the respondent (ranged from €2 to €15) the less likely the individual was to respond positively. Finally those who tended to walk more frequently at lower altitudes were less likely to pay for this upland walk.

<Table 2: WTP logistic regression results uplands walk (Glencoaghan Horseshoe)>

In contingent valuation applications, it is conventional to compute and report median willingness to pay (MWTP). As before the analysis is restricted to respondents expressing a positive WTP. MWTP is the price at which the probabilities of answering 'yes' or 'no' to the willing to pay question are equal, i.e. at which probability of willingness to pay equals 0.5, making dependent variable $\ln(\text{Pr}(\text{yes}_j)/(1 - \text{Pr}(\text{yes}_j))) = 0$ since the natural logarithm of 1 equals zero. MWTP is thus the price at which the estimated regression equation equals zero, given appropriate values of the other explanatory variables (the mean values are generally used). For the two walks this can be computed using parameter estimates as outlined in Tables 1 and 2. Table 3 shows MWTP estimated for both the lowland and upland site. From this comparative ranking of the sites it is clear that WTP is significantly higher for the lowland walk at €12.22 per annum compared to €9.08 per annum for the upland site.

<Table 3: Median WTP lowlands versus upland sites>

6. Conclusion and discussion

An important research aim of the study was to explore which trail related attributes and facilities are important to respondents. On the lowland site those preferring the status quo to remain placed a significantly greater level of importance on features of biodiversity such wild animals, birds and wild flowers as well as the presence of livestock grazing on the landscape. Results are in line with de-briefing questions which suggest that the majority of this group preferred to walk in a more natural undeveloped environment. Provision of a trail received the lowest ranking of any attribute by the status quo group on the lowland site. Those indicating a positive WTP for the proposed waymarked way scenario systematically placed a much higher level of importance on infrastructural attributes.

On the upland commonage site both groups rated the presence of hills very highly. This is consistent with the literature which suggests a primary motivation by upland walkers is experiencing a challenge (Kay and Moxham, 1996). However, in general, there was little difference between the two groups on landscape or biodiversity attributes. As with the lowlands, those indicating a positive willingness to pay again placed a much higher level of importance on infrastructural features. An access agreement with the landowners and measures to control erosion were highly ranked across the 2 sites by both groups in absolute terms. This is consistent with other recent research on the topic (Bogue, 2005). Results indicate that potential consumers have a strong recognition of landowners' property rights as well as the potential damage that can occur by un-coordinated, unmanaged access to farmland for recreational walking. Policy initiatives that deal with improving recreational access to farmland for walking must address both these issues.

Additional research aims were to investigate whether respondents were WTP for a formal waymarked way scenario and whether respondents had a preference for such a scenario on the lowlands or uplands. A two-thirds majority across the lowland (68.6%) and upland (65.6%) sites favoured the proposed way-marked way scenario over the status quo. Those preferring the status quo were strongly averse to a formal trail scenario with

associated infrastructure. It is acknowledged that the authors do not have any evidence that the status quo group (across both sites) will not pay for highly rated features such as an access agreement with landowners, measures to control erosion or features of biodiversity. This is because they were never asked this. They are however strongly averse to a formal trail scenario with associated infrastructure. If such a scenario were implemented on both sites this cohort may well substitute away to other un-formalised walks. Additionally, it should be noted that results suggest that the provision of more access arrangements characterised by waymarked ways would only satisfy a proportion of those people valuing the amenity of the countryside, namely those willing to pay for such facilities as found in the survey. Therefore, a proportion of those not willing to pay for such facilities clearly still value this amenity, including such attributes as biodiversity. Hence, a waymarked way policy favoured by some interest groups, and generally by the government, is one that may fail to satisfy all interests, if singularly implemented and could actually be considered by others to be detrimental. Indeed, following the work of Clinch and Murphy (2001) this group may well be WTP to avoid the implementation of the prescribed scenario. It is probable that there are also differences between overseas visitors and recreationalists from within the Republic of Ireland. A large cohort of tourists who come to Ireland to walk tend to prefer established routes that are easy to locate and follow (Failte Ireland, 2007). Arguably, given that a significant proportion of the sample are infrequent overseas visitors it is unlikely that this group would be willing to pay to avoid the scenario.

A total of 54 per cent of the sample on the lowland site and 44 per cent on the upland site expressed a positive WTP for scenario implementation. This suggests that the formalised scenario as proposed is not universally accepted, particularly in the uplands. Imposition of a trail scored particularly poorly in the attribute rankings. Clearly there are individuals who favour a less formal walking experience. We were unable to clarify the precise demands of these respondents. Further research to identify the exact menu of walking attributes desired by the various different groups of walkers would be of considerable value.

Results indicate that the demand for the proposed walking scenario was stronger on the lowland site as reflected by a median WTP of €12.22 compared to €9.08 for the uplands. On the lowland case study site if the MWTP of €12.22 was aggregated over annual visitor numbers to the Connemara National Park (Kirby, 2006) then total WTP for the scenario could conservatively be estimated to be close to €430,000 per annum. However, these estimates need to be interpreted in the light of the fact that the status quo group were not asked about possible alternatives to a formal trail scenario. Thus a limitation of our empirical results is that they are only concerned with those respondents that had a preference for the way-marked way scenario. Further research is required to establish the recreational demands of this group. This would help clarify whether the status quo group is simply not willing to pay or, alternatively, whether they are willing-to-pay for access in a more remote setting which provides wilderness, adventure and challenge and is free of congestion from other recreationalists. Additional research is also required to estimate implementation and supply side costs. Part of this process would involve an assessment of the level of compensation (if any) required by landowners to facilitate waymarked way implementation. It is also important to explore the institutional conditions necessary to ensure that farmers provide improved recreational access and carry out the required improvements and maintenance to support this activity.

Multi-functionality and delivery of public goods through agriculture is now at the forefront of the policy agenda in the EU and elsewhere (Brunstad et al., 1995; Brouwer and Slangen, 1998; Hanley et al., 1998; Fleischer and Tsurz, 2000; Randell, 2002; Gerowitt et al., 2003; Hall et al., 2004; Bills and Gross, 2005). Recreational activity, of the type described above, constitutes an important component of the multifunctional role played by agriculture in revitalising and sustaining the rural economy. The analysis presented here indicates that there is significant scope for policy approaches that support the development of non-consumptive recreational land uses and sustainable tourism in marginal areas of the Republic of Ireland.

7. References

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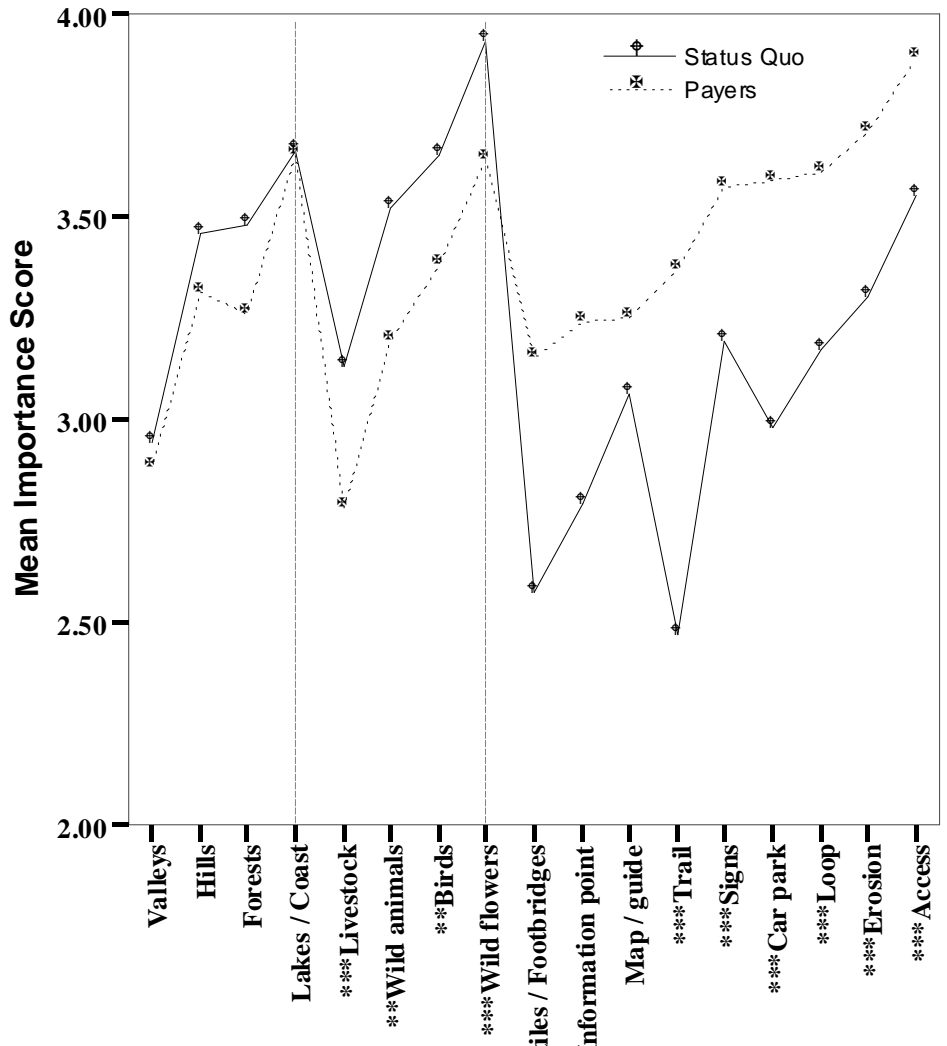
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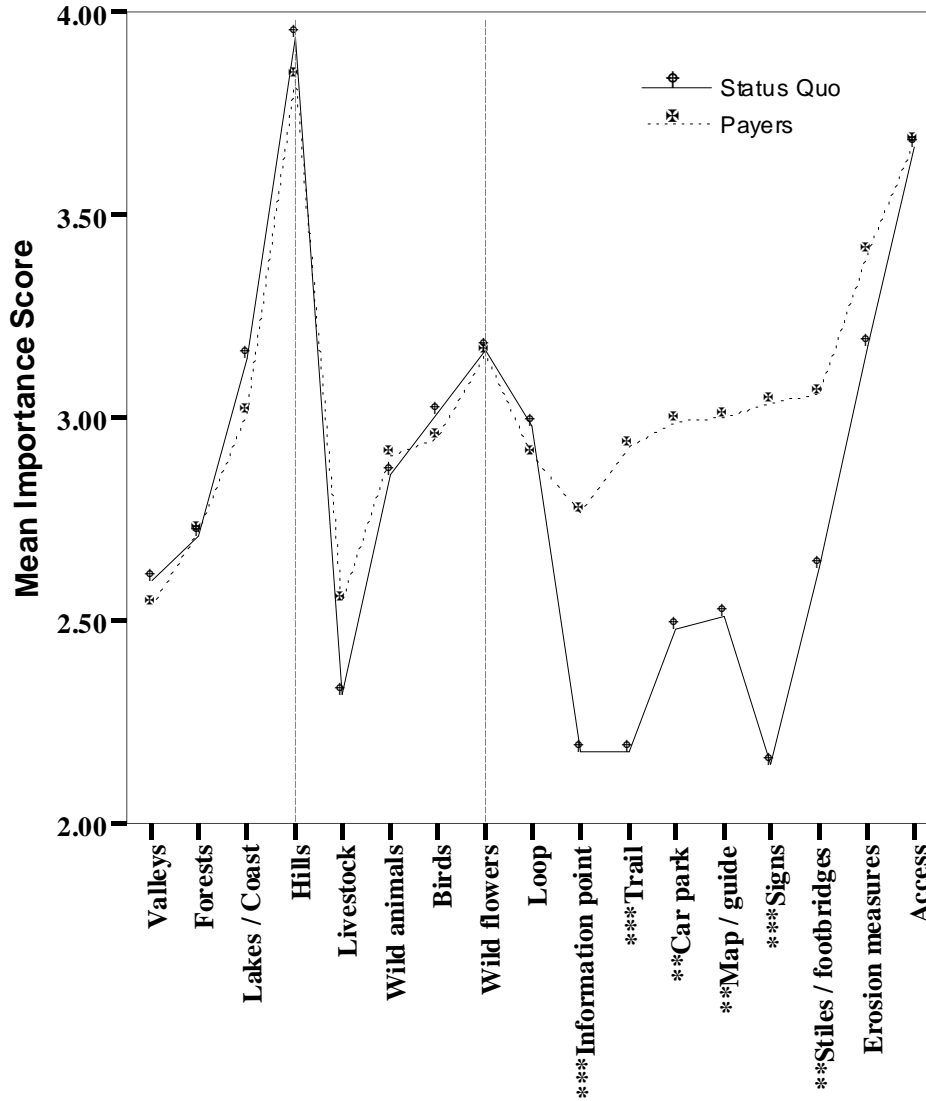
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Figure 1: Mean attribute importance scores for status quo and payer groups on the lowland site



*** significant at 1 per cent level
 ** significant at 5 per cent level
 * significant at 10 per cent level

Figure 2: Mean attribute importance scores for status quo and payer groups on the upland site



*** significant at 1 per cent level
 ** significant at 5 per cent level
 * significant at 10 per cent level

Table 1: WTP logistic regression results Intermediate lowlands walk (Connemara National Park to Lettergesh)

| | |
|------------------|--------------------|
| Price | -0.25 (-6.49)** |
| Walking activity | 0.31 (2.14)* |
| European | -0.83 (-2.47)* |
| Loop NB | -0.72 (-2.15)* |
| Income | 0.20 (2.78)** |
| Constant | 2.03 (3.02)** |
| Observations | 242 |

*significant at 5%; **significant at 1%

Table 2: WTP logistic regression results for the uplands walk (Glencoaghan Horseshoe)

| | |
|------------------|----------|
| Price | -0.38 |
| | (5.55)** |
| Irish | 1.46 |
| | (2.04)** |
| Walking altitude | -0.84 |
| | (2.62)** |
| Constant | 4.49 |
| | (4.91)** |

| | |
|--------------|-----|
| Observations | 113 |
|--------------|-----|

* significant at 5%; **significant at 1%

Table 3: Median willingness to pay on the lowland and upland site (per annum)

| Walk | Median WTP |
|--|-------------------|
| Lowland Walk (National Park- Lettergesh) | €12.22 |
| Uplands walk (Glencoaghan Horseshoe) | €9.08 |