When the public good conflicts with an apparent preference for unsustainable behaviour

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1. Introduction

The principle of sustainability aims to secure the protection of natural resources in a context of social change and without eliminating the opportunity for economic progress (1987). In practice, though, as Knoepfel et al. (2007) remark, agencies charged with promoting the sustainable management of natural resources are often unable to deliver in full due to the problems experienced in practice of balancing divergent social, economic and ecological interests.

In this paper, we introduce the example of Ireland’s peatlands and conservation agencies’ efforts to protect this fragile wetland environment. We demonstrate, by means of joint application of contingent valuation and a series of discrete choice experiments, that peatlands are widely recognized as an essential component of the cultural landscape, but that the social and economic gain associated with continued extraction of peat is an integral part of how this cultural landscape is valued by the local community. Furthermore, the wider community too identify with this social and economic output. In contrast to the views of environmentalists, neither group necessarily believes, or is prepared to accept, that peat extraction is in conflict with the protection of the landscape or its wildlife.

2. Context

2.1. The Sustainability of Landscapes in Changing Social Context

As embodied within the Millennium Ecosystem Assessment (MEA, 2005), the preservation and restoration of natural capital has driven global conservation policy making (Aronson et al., 2007), extending it beyond its former confines to protect the environment of cultural landscapes shaped by generations of low intensity land use. The value attached to these landscapes represents an external benefit that accrues to a diffuse public. However, market failures are present in that these values are not captured by the economic system. Instead, landscape and habitat protection tends to have an opportunity cost, particularly where agricultural or land use policy provides incentives to intensify output. These costs are generally realised by a distinct set of stakeholders (de Groot, 2006) and may be perceived in terms of constraints on freedom to manage the land as much as monetary sums foregone. Consequently, rural environmental policies have often run into opposition from those with a stake in a resource that runs counter to the protection of natural habitats.

Local opinion is important as the prospects of effective habitat protection are often upset by situations where the beneficiaries, i.e. those who value the protection, are geographically or socially distinct from the local population (Goodwin, 1998). However, the multi-functional nature of many natural resources can mean that there are varying points of view within the local population too. Some may favour protection, others may support landowners’ rights to manage the land as they see fit.

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The opportunity to forge a way forward, arises from the fact that landscapes contain evidence of a community's heritage and identity and so can have profound cultural dimensions (Alumäe et al., 2003). Indeed, this social–ecological connection is acknowledged within the text of the European Landscape Convention (Council of Europe, 2000) which views landscape as a bridge that can link people and nature, providing a balance between the use of landscape as an economic resource and its preservation as a component of both natural and cultural heritage (Déjeant-Pons, 2006; Olwig, 2007). Under these conditions, an argument for the protection of landscapes, as distinct from habitats, may engender more local buy-in (Buiks et al., 2006; Last, 2006). Those valuing the cultural landscape almost inevitably include the landowners or rights owners who are instrumental in its management, but who are also directly affected by policies of protection.

2.2. Ireland's Peatlands

We examine peatlands as one environment that is experiencing a confrontation of ecological and cultural values. Peatlands in Ireland are both a natural habitat and an economic resource. As a natural and dynamic habitat they are home to many specialised, but often unfamiliar species at several trophic levels. As a cultural landscape, they have been continually modified, rather than specifically created by human activity. Their value is in their familiarity within the Irish rural landscape and their traditional relationship with local communities. They are also illustrative of the challenges facing habitat and landscape conservation in circumstances where their management is changing, but where the public’s appreciation of their value is based on traditional cultural associations.

Although less than 3% (around 400 million hectares) of the Earth’s terrestrial surface contains peat soils, they contain over 60% of the Earth's terrestrial carbon (460 Gt) which is two to three times that which is stored in tropical rain forests and is about the same as that of the atmosphere (Parish et al., 2007). Unfortunately, drainage of peatlands globally is turning them from a net sink to a net source of atmospheric carbon (Mitsch and Gosselink (2000, p. 527)). In the northern latitudes, peatlands are generally water-logged environments and, as a consequence, are often amongst the few environments that have not been cultivated. This has not, however, prevented their exploitation for fuel or grazing. Furthermore, in recent decades, public subsidies have permitted activities that have often been incompatible with the sustainability of the peatland ecosystem. For example, public funds have facilitated the development of peatlands for year round grazing or commercial forestry. Only under very favourable circumstances have these activities proven to be economic. There have been some social benefits to this investment as a stimulus to employment and rural development. However, there have been external costs too and the scale of these costs has risen as peatlands, in their more natural state, have come to be associated with other public benefits.

In Ireland, peatland occurs as both lowland raised bog and coastal or upland blanket bog. Although these bogs are wild areas, they were nevertheless part of the rural way of life, particularly in summer when whole rural communities would descend on the bogs to hand cut peat, or “turf”, for winter fuel. Despite the abundance of bogs, this long history of domestic peat cutting has taken its toll on the total peatland area and its hydrology. Peat extraction requires the cutting of drains which lower the high water table upon which a healthy bog depends. In recent years, surface hand cutting has also been commonly replaced by the mechanical cutting of peat from the periphery of the bog, accelerating the lowering of the water table. As a consequence, the peatland plant communities whose remains amount to the accumulation of peat in the natural anaerobic environment are replaced by vegetation which prefers drier or disturbed conditions. As the bog dries out the characteristic dome of a saturated “raised” bog subsides (Silins and Rothwell, 1998) and it becomes incapable of supporting specialist peatland plant communities (Wheeler and Shaw, 1995).

Since the middle of the last century, domestic peat cutting has been joined by cutting on an industrial scale undertaken principally to supply fuel for electricity generation. This activity has also been underpinned by public subsidy. It involves the removal of surface mosses and peat leaving behind a barren landscape of peatland “cutaway”. Currently between 80,000 and 100,000 ha of former lowland raised bog is under industrial management.

The combined result has been a marked loss of pristine, or near pristine, peatland. Peatlands once covered 1.2 million hectares or 17% of the land area of Ireland (Feehan and O’Donovan, 1996; Hammond, 1981). Only 8% of the original area of raised bog and 21% of that of blanket bog are believed to remain intact. Much of what has been lost is either industrial cutaway or bogs that were formerly ‘cutover’ for domestic fuel.

2.3. Public Benefits and Peatlands

The area of industrial cutaway available for peat extraction is sufficient for 20 years. Similarly, there is no shortage of peat for household cutting. Consequently, the market value of peat has not changed significantly. However, as the area of near-intact peatland has declined, its public good benefits are increasingly being recognised. Evidently, peatlands provide a cultural ecosystem service as a valued component of the Irish landscape. They are also acknowledged as a home for distinct plant and animal communities (Joosten and Clarke, 2002; Moore and Bellamy, 1974).

The hydrological properties that are often presumed to be a regulating ecosystem service may be exaggerated given that most bogs are saturated in their pristine state and offer limited protection against extreme rainfall events (Holden, 2005). The importance of peatlands in sequestering CO₂ is, however, a very significant regulating service and one that has gone unvalued until recently. Unfortunately, as few Irish peatlands remain in an intact state, they are unable to provide this ecosystem service and more typically contribute to net emissions as they degrade (Wilson, 2008). Nevertheless, aside from these emissions, peatlands remain as substantial stores of carbon. Were they to become severely degraded, this massive stock of carbon would be emitted to the atmosphere and could contribute significantly to climate change.

Market failure is present in that these values have gone unquantified. Despite the changing value context, a policy lag and market intervention failure remains. Peat fuel is effectively subsidised through a Public Service Obligation under which the electricity distributors are required to purchase a proportion of the power produced from peat. Compared with the value of these price distortions, relatively small sums of money have been spent by the National Parks and Wildlife Service to protect bogs. The semi-state industrial peat company, Bord na Móna, is obliged to rehabilitate worked commercial cutaway, but only to a minimum standard. Very little peatland cutaway has been actively restored with the aim of realising the ecosystem service benefits.

2.4. Management of Peatlands

Despite the European Landscape Convention, there is no national policy of landscape protection in Ireland. A nascent policy was being developed by An Foras Forbartha, but the state agency was abolished in 1989. Peatlands have, though, by the nature of their hydrology, escaped much of the extensive residential development that impacted on many other attractive landscapes during the economic boom between 1995 and 2008.

Peatlands have also some of the characteristics of a common property resource without being governed by common property
regimes intended to support their sustainable use. They are ‘managed’ by local people with ‘turbary rights’ to cut peat for fuel. Management, though, is limited to agreement on the cutting of drains and, in more recent times, on harvesting by a commercial contractor. There are no collective rights that can be used to regulate use or to exclude other rights holders.

Crucially, while the peatland is a shared resource, it is not a renewable resource and its ecological resilience is extremely low. Peatland ecology may be dependent on the actions of others, but the ability to extract peat is not. Each rights holder has exclusive access to a strip of bog. As for most bogs, the peat stock is considerable, the holders of turbary rights do not need to worry about internalizing the social costs associated with depletion.

3. Economic Assessment

3.1. Survey of Public Preferences for Peatlands

Between the spring and autumn of 2008, we undertook two face-to-face surveys to examine public preferences for Ireland’s peatlands. These quantitative surveys were complemented by concurrent qualitative research involving semi-structured interviews (Collier and Scott, 2008, 2010). Both studies formed part of a larger project, BOGLAND (www.ucd.ie/bogland) which was charged with determining strategies for the sustainable management of peatlands and was funded by the Irish Environmental Protection Agency (EPA).

The first of the surveys was a National Survey intended to establish the public good value of a national policy of protection of raised and blanket bogs. The second survey, or Cutaway Survey, aimed to examine public preferences for the after-use of industrial cutaway. One option that has been considered for cutaway is the creation of a National Peatlands Park in the Irish Midlands. We were interested to know if both local people and the wider population believed such a park could supply a public benefit.

In both surveys, respondents were asked various behavioural and attitudinal questions followed by a double-bounded dichotomous choice contingent valuation question. For the Cutaway Survey, this question was also followed by a set of four discrete choice experiments.

Contingent valuation is a stated preference approach regularly used in environmental economics to determine the utility value that individuals place on a public good or on prospective policies that can deliver such an outcome, including environmental policies. The method has often been used to value rural landscapes (e.g. (Bullock and Kay, 1997)), wilderness designations (e.g. (Walsh et al., 1984)) and wetland parks (e.g. (Bateman and Langford, 1997)). However, Kimmel and Mander (2010) find few studies of the cultural value of peatland ecosystem services and Brander et al. (2006) do not give examples of peatland valuation in their meta-analysis of wetland valuation.

Following a set of preliminary questions about awareness, behaviour or motivations, respondents are typically asked for their maximum willingness to pay to secure (or prevent) a particular outcome. The willingness to pay reflects the amount that they are prepared to give up in return for the outcome noting that money or income can secure other goods that contribute to well-being. A dichotomous choice approach is commonly argued to be incentive compatible in that respondents are asked to agree (or not) to a sum (or bid) stated by the interviewer. These sums are varied for each respondent depending on a statistical design, typically underpinned by preliminary research or pilot surveys used to indicate the probable range of acceptable bids. In a double-bounded dichotomous survey, the initial bid is succeeded by a follow-up amount that, depending on the response to the first bid, could be a proportion more or less of this amount.

After testing on a trial sample, the final questionnaire was undertaken face-to-face by professional interviewers. Households were selected randomly using the GeoDirectory database of dwellings. Sampling intensity was higher in peatland areas, namely within a 50 km radius of the study area for the Cutaway Survey. Both questionnaires were accompanied by information sheets describing the past and current (much diminished) extent of peatlands. Assumptions of respondents’ capacity to absorb facts from such sheets has been criticised by Burgess et al. (1998) who argue that the pressures of an interview situation make this assumption difficult to defend. However, while acknowledging that differences of opinion exist on the amount of background material to be presented (Chilton and Hutchinson, 1999), the content analysis of the three preceding focus groups was used to obtain a balance between under and over-provision of information.

The information sheet represented a mix of written and illustrated material designed to be both as straightforward and comprehensive as possible in the circumstances. Peatlands are a familiar part of the landscape, but are not central to most people’s lives and their ecology is not widely understood. The topic is also sensitive in that many people cut peat for fuel and could be resistant to the notion of protection. Therefore, the information sheet aimed to communicate the essential facts and not to present a conservation message. It did, though, need to acknowledge that the condition of peatlands is deteriorating due to commercial and household peat cutting, over-grazing and conversion to forestry or grazing land. The benefits of sustainable management were described as the protection of specialist flora and fauna and of a familiar cultural landscape. The questionnaire did not dwell on the benefits of carbon sequestration as the focus groups had revealed little appreciation of this ecosystem service.

3.2. Results

Altogether, usable data from 520 interviews was obtained for the National Survey and from 494 interviews for the Cutaway Survey. For brevity, and to emphasise some of the contradictions apparent in people’s perception of the value of peatlands, we focus on the Cutaway Survey, the sample for which was a belt across the middle of Ireland where most raised bogs are found.

All respondents were asked to choose three items from a list of seven that most represented the motivation for their interest in the environment (if any). Concern with future generations was the frequent environmental motivation given (49.5%) followed by health (42.8%) and threats to the environment (42.6%). Landscape (27.7%) and wildlife (27.5%) were also mentioned frequently.

Asked about policy priorities, 79.6% of respondents agreed that the government should use tax to protect the natural environment, although only 37.1% “agreed strongly”. The proportion of respondents who agreed that landscape and wildlife protection should be given high priority was 49.4%. Two-thirds (67.9%) of respondents lived near bogs and 53.3% had visited these at some time. Although many respondents cut peat (26.7%), a higher proportion considered bogs to be most important as ‘heritage’ (41.1%) compared with ‘fuel’ (38.9%). People living within 10 mi of a bog were even more likely to believe that bogs were most important as heritage (46.5%).

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1 This is a traditional right to cut turf in Ireland and it is usually part of the land lease of a small holding. In this paper, the term turbary rights holder (or turbary owner) and peat cutter is used interchangeably.

2 The GeoDirectory has available from An Post (the Irish postal service) and Ordnance Survey Ireland.

3 The questionnaire and information sheet is available from the authors.

4 63% of respondents.
Respondents were asked to rank their preference for the four possible park landscapes for which illustrations were provided. These scenarios were

- restoration of the peatland landscape,
- assisted natural transformation to a landscape of open water, reed bed, peatland and woodland,
- creation of a similar landscape but with a strong emphasis on recreation and tourism,
- a scenario of do-nothing.

The scenario of protection and restoration of peatland topped the first preferences at 32.5%, compared with 22.7% for the natural landscape, although this scenario did attract more second rankings at 38.9% (compared with 25.3%). The recreation/tourism scenario was rated first by 23.9% of respondents compared with (a still sizeable) 20.7% who most preferred a policy of “do nothing”. In terms of overall preferences, the natural landscape scenario was rated highest. If ‘WTP in principle’ is modelled, the output reveals a significant preference only for the peatland restoration scenario.

Respondents were then asked the contingent valuation question “would you support additional spending on a Natural Peatlands Park in line with the preferences you indicated in the last few questions?” It was proposed that a park would be created by government and that environmental restoration would proceed in line with the overall public preference. Each respondent was presented with a single bid value between €10 and €250 per person per year. A high proportion of respondents (68.8%) was willing to pay in principle for a park. For the first payment question in the double-bounded dichotomous choice question, 45.6% were willing to pay. This figure rose to 62.8% for the follow-up bid which was set at half or twice the initial bid depending on the first response.

Before the introduction of attitudinal and behavioural covariates, bid, or its logarithm, logbid, is the most significant variable, followed by bogdis, i.e. distance to the nearest bog (negative), urban residence (urban) and income or class.5

Once attitudinal questions are included, concern with landscape (landscape) and perceived importance of peatlands (bogimp) are significant, but a better model fit is achieved by their replacement by composite indicators that demonstrate interest in environment (envsco) or concern with rural development (devsco)—respectively positive and negative. These indicators were calculated based on responses to each attitude question for which interest in environment (envsco) or concern with rural development (devsco)

The choice experiment was intended to throw light on the preferred composition of a peatland park. Three alternatives were presented, two park alternatives for which a selection of key park attributes were varied based on an orthogonal factorial design and a third do-nothing alternative. The attributes included in the experiment are listed in Table 2. Respondents were asked to the WTP values they had previously given and asked to select their preferred alternative with this in mind. Price therefore remains constant for each alternative, but varies between respondents while not being a product of the factorial design.

Respondents’ support for a park is revealed through significant coefficients for the respective alternative specific constants compared with the do-nothing scenario. The standard multinomial model is a weak improvement on a constants only model as rather few parameters are significant. Respondents, it seems, are most concerned with the creation of a park and have less determined preferences as to its specific attributes. Of the significant attribute levels in Table 3, Time (25 years), Wildlife (visitor facilities) and Activities (many) have modest coefficient values relative to the constant. A negative coefficient for Activities (many) supports the preference expressed earlier for a landscape less given over to tourism. However, of most interest is that Peat (continued household peat cutting, but no industrial cutting) is significant and positive while Peat (no cutting of any kind) is significant and negative. In addition, the significance of the level for a medium (rather than short) time-scale runs counter to the usual expectations of time preference. At face value, the results appear to suggest that while most respondents would value a corresponding non-parametric mean estimate derived using the method proposed in Bateman (1999 #33) is €79.92 per person per year. This compares with an estimate of €56.23 from the National Survey for a countryside policy of peatland protection.

The WTP computation based on the full set of single and double-bounded data takes into account all four possible responses to the payment questions including of those who were not WTP. Estimates are required of α and β for a “yes” response to the initial payment question and “Yes, Yes” and “No, No” responses to the follow-up, where probabilities are as follows:

Pr(YN)=1/1+e^(-α+βBidL)  
Pr(NY)=1/1+e^(-α+βBidU)  
Pr(YY)=1/1+e^(-α+βBidF)  
Pr(NN)=1/1+e^(-α+βBidI)

where BidI, BidII, and BidL stand for the initial bid level, the upper bid level and lower bid level respectively.

### 3.3. Choice Experiment

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Cutaway Survey—contingent valuation results.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First WTP question</strong></td>
<td><strong>Follow-up WTP question</strong></td>
</tr>
<tr>
<td>Variable</td>
<td>Coeff.</td>
</tr>
<tr>
<td>lnbid</td>
<td>1.441</td>
</tr>
<tr>
<td>Envscot</td>
<td>.688</td>
</tr>
<tr>
<td>Devsco</td>
<td>-.378</td>
</tr>
<tr>
<td>Class</td>
<td>.094</td>
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<tr>
<td>Log_Income</td>
<td>.157</td>
</tr>
<tr>
<td>Constant</td>
<td>4.234</td>
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</table>

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Choice set attributes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attributes</td>
<td>Level 1</td>
</tr>
<tr>
<td>ACTIVITIES</td>
<td>Walking where access allows</td>
</tr>
<tr>
<td>TRAILS</td>
<td>Few</td>
</tr>
<tr>
<td>TIME</td>
<td>50 years</td>
</tr>
<tr>
<td>PEAT</td>
<td>Industrial and household cutting</td>
</tr>
<tr>
<td>RARITY</td>
<td>Mostly familiar species</td>
</tr>
<tr>
<td>WILDLIFE VIEWING</td>
<td>Not easy to view wildlife</td>
</tr>
<tr>
<td>PRICE</td>
<td>As WTP</td>
</tr>
</tbody>
</table>

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5 The respondent’s probable social class was recorded by the interviewer on the basis of definitions provided by the Central Statistics Office.
A plausible reason for the weak attribute significance of the multinomial model is that there is no general agreement of how a park should look, namely that there is heterogeneity of preferences. An alternative mixed logit approach allows us to distinguish between the uncorrelated random error and the random term that can be used to identify how preferences vary between respondents and respondent types. Such an approach, excluding the fixed variable of Price reveals that no single behavioural or socio-demographic variable has a sustained impact on the results. However, a persistently significant negative relationship between the composite of positive environmental responses (envsco) and Peat (continued household cutting) is apparent. Significant variation remains for the higher level of Peat (no cutting), but the below diagonal segment of the Cholesky matrix suggests that this is accounted for by cross-correlation between the two levels of the attribute. The coefficient for continued household cutting continues to be positive while that for no cutting of any kind remain distinctly negative.

4. Discussion of Results

The valuation surveys present two initially puzzling results. In the first instance, the estimated WTP for the spatially confined Park survey is greater than for a national policy of peatland protection. Indeed, the prevalence of WTP is much less in the case of the latter survey such that this gap is widened once true zero bids are included for reducing the area of Irish bogs. Of more interest for sustainable peatland management is the result that fails to pass a scope test as people should be willing to pay just €15.54 per person per year for the National Survey. In principle, the result fails to pass a scope test as people should be willing to pay more for a national policy of protection than a local one.

However, this first result can be explained to the extent that like is not being compared with like. A peatland park is not the same concept as a national policy of peatland protection as the former was suggested to involve either restoration of cutaway or its transformation to a landscape in which peatland is only one element. Furthermore, respondents may consider a park to be a less nebulous concept than a policy of peatland protection. The analysis does indicate a negative interaction between this attribute level and higher social class or the environmental concern. The relationship is borne out by the significance of envsco in the mixed logit results. Overall, though, a significant negative value for Peat (no cutting of any kind) remains. It seems likely that many respondents, including local people and peat cutters, see no contradiction between peat cutting and restoration of the bog.

Clearly there was much more for a national policy of protection than a local one. While a majority still favoured a park scenario over no-intervention, this was not for a landscape of peatland restoration. By comparison, no clear scenario preference was apparent for those respondents generally who considered peatlands to be more important as heritage.

Peat extraction is, to a degree, sustainable if done traditionally by hand on a small-scale. Overall, though, peatlands are not resilient ecosystems and such arguments deny the damage now done by mechanical drainage and cutting. Nevertheless, it is sometimes suggested by associations representing peat cutters that peatlands are a renewable rather than non-renewable resource. Indeed, Adger (2000) refers to a world-view postulated by Holling et al. (1995) and Gunderson et al. (1997), and previously given cultural resonance by Schwarz and Thompson (1990), in which people conceive of the environment as benign, balanced or resilient. Harrison and Burgess (1994a) observe that such rationalities can cause their adherents to be predisposed to accept or justify different arguments. Hence, peat cutters may believe that household cutting is sustainable even when mechanical diggers are used to remove peat or to cut drains that accelerate the drying out of the raised bog that remains. Others, perhaps understandably, argue that the industrial scale cutting that scars much of the landscape of the Irish Midlands must mean that any lower intensity operation is inherently sustainable. If some respondents perceive an alternative agenda to the survey they may withdraw to such positions despite the detail given in the information sheet.

The evidence from our discussions with peat cutters and local people is that industrial cutting is believed to be unsustainable. Indeed, the view was often expressed that the bogs should be allowed to return to a more natural state. Household cutting was not, however, included in these sentiments. Rather, our interviews often revealed less support for the former. This is perhaps not surprising in that industrial cutting looks catastrophic even though the top down nature of extraction means that restoration is possible in principle, albeit only through extensive re-wetting and unblocking of drains (Farrell and Doyle, 2003). By comparison, household cutting from the edge of the bog using machinery remorselessly undermines the peatland hydrology as noted in Section 2.2.

The preference for continued household cutting is not ubiquitous. The relationship is borne out by the significance of envsco in the mixed logit results. Overall, though, a significant negative value for Peat (no cutting of any kind) remains. It seems likely that many respondents, including local people and peat cutters, see no contradiction between peat cutting and restoration of the bog.

Certainly, amongst responses to earlier questions, there is a correlation between being a peat cutter and the importance placed on landscape, both as a motivator of environmental interest and as a policy perceived to be important. Peat cutters also placed a high value on wildlife (Table 4).

Generally, though, peat cutters considered peatlands to be more important as a source of fuel than as heritage and were also less likely to be willing to pay for peatland protection or a national park. While a majority still favoured a park scenario over no-intervention, this was not for a landscape of peatland restoration. By comparison, no clear scenario preference was apparent for those respondents generally who considered peatlands to be more important as heritage.

Peat cutters differed in their attitudes towards peatlands. Of more interest is the result that cutaway was considered the least important as heritage and was also less likely to be supported by those respondents generally who considered peatlands to be more important as heritage. This suggests a rationality that is consistent with a desire to support traditional practices, albeit in an environmentally sustainable manner. Of more interest for sustainable peatland management is the observation that many respondents, including local people and peat cutters, see no contradiction between peat cutting and restoration of the bog.

Of more interest for sustainable peatland management is the second observation that, while people appear to be willing to pay for a peatland park, many may not want to have such a park fully established in the short term and most would rather it permit a continuation of an activity that they have been advised is responsible for reducing the area of Irish bogs.

A distinction was made in the choice experiment between industrial cutting and household cutting and clearly there was much

### Table 3

Multinomial model (bold = significant at 5%).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Coefficient</th>
<th>SE</th>
<th>Signif P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTIVITIES (some)</td>
<td>0.059</td>
<td>0.048</td>
<td>0.218</td>
</tr>
<tr>
<td>ACTIVITIES (many)</td>
<td>-0.164</td>
<td>0.049</td>
<td>0.001</td>
</tr>
<tr>
<td>TRAILS (some)</td>
<td>0.144</td>
<td>0.054</td>
<td>0.792</td>
</tr>
<tr>
<td>TRAIL (many)</td>
<td>-0.079</td>
<td>0.057</td>
<td>0.165</td>
</tr>
<tr>
<td>TIME (25 years)</td>
<td>0.144</td>
<td>0.049</td>
<td>0.003</td>
</tr>
<tr>
<td>TIME (10 years)</td>
<td>0.028</td>
<td>0.045</td>
<td>0.537</td>
</tr>
<tr>
<td>PEAT (household)</td>
<td>0.213</td>
<td>0.051</td>
<td>0.000</td>
</tr>
<tr>
<td>PEAT (no cutting)</td>
<td>-0.230</td>
<td>0.049</td>
<td>0.000</td>
</tr>
<tr>
<td>RARE (some species)</td>
<td>0.065</td>
<td>0.051</td>
<td>0.205</td>
</tr>
<tr>
<td>RARE (many species)</td>
<td>0.074</td>
<td>0.047</td>
<td>0.119</td>
</tr>
<tr>
<td>WILD (easy to view)</td>
<td>-0.017</td>
<td>0.052</td>
<td>0.747</td>
</tr>
<tr>
<td>WILD (visitor facilities)</td>
<td>0.116</td>
<td>0.049</td>
<td>0.019</td>
</tr>
<tr>
<td>PRICE (absolute)</td>
<td>-0.001</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Alternative Park1</td>
<td>1.132</td>
<td>0.141</td>
<td>0.007</td>
</tr>
<tr>
<td>Alternative Park2</td>
<td>1.160</td>
<td>0.138</td>
<td>0.000</td>
</tr>
</tbody>
</table>


Terms not included in the model were: TIME, RARE, WILD, PRICE, and the interaction of Q12 and Q13.
that the opposition to efforts to curtail peat cutting arose from irritation over the role of outside forces. These outside institutions were perceived as coercing local people into abandoning rights held for generations to an activity that continues to support local incomes, albeit to a modest degree (Collier and Scott, 2009). Of course, resentment amongst rural communities to outside interference by conservation agencies is not uncommon (see Fjellstad et al. (2009)). Moreover, non-local or urban respondents are not detached from an awareness of these considerations. Many Irish people retain a family connection with rural areas or perhaps possess an emotional perception of a peatland cultural landscape fostered by romantic depictions of the rural idyll in Irish art. Respondents are also not exclusively, or even necessarily, motivated by purely personal preferences, but may be guided by ethical or social arguments too (Spash, 2000; Burgess et al., 1998). In our case, the attributes based format of the choice experiment allowed many respondents who had been willing-to-pay in the contingent valuation exercise to reject alternatives that prescribed no household peat cutting.

5. Implications for Policy

Conservation policy to date has involved cajoling peat cutters into accepting compensation in return for either abandoning turbarv rights or for withholding from cutting. So far, the policy has been voluntary, but in response to the EU Habitat Directive, (1992), the Irish Government has proscribed peat cutting on 32 bogs that have been designated as being of high conservation status.

Although, in principle, designation does not require compensation, this has been made available as an incentive by the National Parks and Wildlife Service given the economic and cultural significance return of peat cutting. To date, though, the strategy has not been very successful. While people can choose to retain their turbarv rights, they may perceive compensation to be a route to permanent loss of rights that would have been held for generations. In addition, self-exclusion, by way of accepting compensation, has a cost in terms of one's standing in the community given that mechanical harvesting of the peat is more awkward whereas a strip is taken out of production. Hence, both personal beliefs and subjective norms are at work (Fjellstad et al., 2009). As long as harvesting continues the effectiveness of conservation is also undermined by drainage on neighbouring strips.

Conservation policy has also had to function in a context where government continues to support, by means of an effective subsidy, industrial-scale peat cutting, a business that local people clearly regard as being far more environmentally damaging than their own smaller scale activity despite its own damage to the peatland. Furthermore, while the Turf Cutters and Contractors Association has a low national profile, the farming and rural vote has considerable leverage over politicians. In this environment, the conservation agencies are presented as being outsiders supported by a Brussels based bureaucracy not articulate (Fjellstad et al., 2009). For examples note Hickey, D. and Gilmore, T., Irish Examiner 20/3/08 "Turf cutters fear EU ban will be extended", Irish Examiner, Dublin, O'Dwyer, E., An Phoblacht 27/8/09. "Turf cutters tell EU to sod off", Dublin, Anon, Roscommon Herald 23/9/09 "Turf Cutters turn up the Heat", Roscommon Herald, Boyle, County Roscommon.

ecology. Nevertheless, the agencies would be advised to extend their interaction with peatland communities beyond the “passive participation” (Pretty, 1995) attempted to date (Collier and Scott, 2009). While mechanical peat cutting is fundamentally unsustainable to the future of the bog, the agencies do need to confront the political realities and entrenched self-interests that often exist in rural communities (Jones, 2003). The risk is that insensitive conservation policy could provoke local self-organisation and opposition by failing to comprehend property rights and political realities (Gerber et al., 2009; Sharpf, 1994).

Based on the survey results, it would appear that both peatland communities and a proportion of the wider public, favour the continued household cutting of peat. On the other hand, a majority of people were willing to pay for peatland protection or for a national park. Clearly, peatlands are valued as a cultural landscape even where the concept itself is not articulated.

Altogether, one is given the impression of there being a way forward. Commonage Framework Plans applied to grazing areas in Ireland could be one template. Under these agreements, sheep farmers retain their property rights but collectively devise a management regime that caps grazing pressure on common land. A similar mechanism could be applied to peatlands while accepting that the complexities and sensitivities require adaptive management.

A pre-requisite for any co-management scheme is for conservation agencies to provide all stakeholders, i.e. local communities, the wider public and policy makers with a better understanding of the public goods that peatlands provide. There is some potential here in that the survey results demonstrate that the public good value of peatlands as a cultural landscape is beginning to be acknowledged. The challenge is to harness that value. There is merit in informing people about the vulnerability of peatlands and the manner in which peat cutting undermines the sustainability of the resource and the ecosystem services it provides. However, there is also a need for the conservation agencies to endeavour to understand the psychology of communities in peatland areas and of the influence of property rights. This includes the need to grapple with many people's wish to see peatlands as a productive resource while simultaneously supporting peatland restoration.

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