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WHEN THE PUBLIC GOOD CONFLICTS WITH A 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 (World Commission on Environment and Development, 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 environmental interests, 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. But 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.

The opportunity to forge a way forward, arises from the fact that landscapes contain evidence of a community's heritage and identity and so have a strong cultural dimension (Alumäe et al., 2003).

Perceptions of the benefits of protection are therefore not confined to aesthetics and wildlife, but involve social and cultural attributes that may be valued by a diverse range of people. Under these conditions, an argument for the protection of landscapes, as distinct from habitats, may engender more local buy-in (Buijs 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.

This social-ecological connection is acknowledged within the text of the European Landscape Convention (Council of Europe, 2000), which advocates a spatial or landscape planning approach. The convention emphasises the contribution that landscape makes to regional and cultural identity and to quality of life. It views landscape as a bridge that can link people and nature, proposing 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).

2.2 Study context

2.2.1 Peatlands

We examine peatlands as one environment that is experiencing a dynamic confrontation of ecological and cultural values. Peatlands in Ireland are both a natural habitat and an economic and cultural resource. As a natural 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 and relationship with local livelihoods 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 gigatonnes) 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 (Mitch 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 investment and subsidy 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. Large scale drainage has also permitted the harvesting of peat on a commercial scale for electricity generation. 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 were 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. Localised cutting of raised bog is not a solution as it still impacts on the level of the water table across the whole bog. 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 conditions. As the bog dries out, the characteristic dome of a saturated “raised” bog subsides (Silins and Rothwell, 1998). Under extreme conditions the surface becomes drier and cracks and becomes incapable of supporting any 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 involves the removal of surface mosses and peat leaving behind a barren landscape of peatland “cutaway”. Currently between 80,000 and 100,000 hectares of former lowland raised bog is under industrial management.

The 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. In addition to the industrial cutaway, many areas that were formerly ‘cutover’ for domestic fuel have been transformed into grazing land or have been replaced by commercial forestry .

2.2.2 Public benefits and peatlands

The area of industrial cutaway available for commercial peat production is sufficient for 20 years. Similarly, there is no shortage of peat for household extraction. Consequently, the market value of peat has not changed significantly. However, as the area of near-intact peatland has been falling, 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, being particularly rich in terms of invertebrate and aquatic species. The anaerobic conditions also contribute to the preservation of archaeological remains (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 are saturated in their pristine state and fail to act as buffers 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 (Wilson, 2008). Indeed, CO₂ emissions from the woody scrub that has invaded many former domestically cut bogs appear to be the highest of all peatland landscapes (Byrne et al., 2007). Nevertheless, aside from the 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. Policy continues to be based on the extractive value of peat. 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 the peat. Compared with 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.

2.2.3 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 1995-2008. Peatlands have some of the characteristics of a common property resource without being governed by common property regimes intended to support their sustainable use. Thus, they are not subject to rules that "require, forbid or permit specific actions for more than a single individual" (Ostrom, 1986), but are

“managed” by local people with “turbary rights” to cut peat for fuel.¹ Management is limited to agreement on the cutting of drains and, in more recent times, on harvesting by a commercial contractor Peat cutting. However, 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 low. The 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. Where surplus peat is sold, this often occurs through the informal market. They are no taxes or charges to reflect the loss of public benefits to others and no social returns from protecting the stock.

On a handful of designated bogs, turbary rights holders can individually accept private compensation from the National Parks and Wildlife Service in exchange for turbary rights or for withholding from cutting. However, while the compensation compares well with the market price of peat, it compares poorly with the cost of alternative heating fuels (although being cleaner and more convenient, these are often preferred). Furthermore, while people can choose to retain their turbary 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 where 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.

3. 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. The surveys were complemented by concurrent qualitative research involving semi-structured interviews (Collier and Scott, 2010; Collier and Scott, 2008). Both studies

¹ This is a traditional right to cut turf in some locations 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.

formed part of a larger project, BOGLAND (www.ucd.ie/bogland) which has been funded by the Irish Environmental Protection Agency (EPA) and is charged with determining strategies for the sustainable management of peatlands.

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. Respondents were presented with information on the extent and condition of peatlands before being asked various behavioural and attitudinal questions followed by a double-bounded dichotomous choice contingent valuation question.

The second survey aimed to examine public preferences for the after-use of industrial cutaway, i.e. peatlands that have been cut commercially for peat fuel. One option that has been considered for cutaway is the creation of a National Wetlands Park in the Irish Midlands. We were interested to know if both local people and the wider population across a belt of central Ireland believed such a park could supply a public benefit.

The Cutaway Survey also contained a contingent valuation structured as for the first survey, but followed by a set of four discrete choice experiments. The willingness to pay (WTP) value was carried across as an attribute to accompany a combination of physical and time-scale attributes. Respondents were asked to identify what they thought should be the primary function of such a park, namely to serve wildlife or recreational needs.

Both questionnaires were accompanied by information sheets describing the past and current (much diminished) extent of peatlands. The principal reasons for this loss were identified as commercial and household peat cutting, overgrazing 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 discussion and focus groups undertaken prior to the survey revealed little appreciation of this ecosystem service.

The questionnaire was undertaken face-to-face by professional interviewers. Respondents were allowed time to read separate information sheets. Altogether, usable data from 520 interviews was obtained for the National Survey and from 494 interviews for the Cutaway Survey.

3.1 Results

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 while drawing some comparisons with the National Survey. Whereas the latter had involved interviews across Ireland, the Cutaway sample was restricted to a belt across the middle of Ireland where most raised bogs are found. It also included a heavier concentration in the local area and counties surrounding the proposed park location.

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 environmental motivation given (49.5%). Health was mentioned next most frequently (42.8%) followed by threats to the environment (42.6%). Landscape (27.7%) and wildlife (27.5%) were mentioned frequently, but less than personal well-being (31.7%).

Asked about policy priorities, three quarters (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%. As with the national survey, there was little difference in the figures compared with policies that prioritise rural development (49.8%) or which place people first (48.8%). More respondents in the sample area were familiar with both industrial and domestic peat cutting than had been the case for the National Survey. Although more respondents also 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 miles of a bog (65.0%) were even more likely to believe that bogs were most important as heritage (46.5%).

Respondents were asked to rank their preference for the four possible park landscapes for which illustrations were provided. These scenarios were a restoration of the peatland landscape, an assisted natural transformation to a landscape of open water, reed bed, peatland and woodland, a similar landscape but with a strong emphasis on recreation and tourism, or a scenario of do-nothing. Overall, the wetland/woodland wildlife scenario was most preferred, although peatland restoration topped the first preferences (32.6%). One fifth of respondents (20.6%) most preferred a policy of "do nothing".

In the contingent valuation question each respondent was presented with a single bid value between €10 and €250 per person per year. A higher proportion (68.8%) of respondents was willing to pay in principle for a park compared with the national policy of peatland protection presented in the former survey (61.7%). For the first payment question in the double-bounded dichotomous choice question, 45.6% were willing to pay. Only bid, or its logarithm (logbid), and bogdis, i.e. distance to the nearest bog (negative), are significant before the introduction of attitudinal and behavioural covariates. Among the socio-demographic variables, Class, or Income (estimated for missing cases), have the expected sign, but neither achieves a significance threshold. Once attitudinal questions are included, urban residence (urban), concern with health (health), perceived importance of peatlands (bogimp) and composite indicators of interest in environment (env) and economic development (dev) - respectively positive and negative - are significant. Of the alternative park scenarios, preference for peatland restoration is significant, and negative, when ‘WTP in principle’ is modelled, but the scenario variables only emerge as significant indicators of WTP for the follow-up bid and then when based on overall preference rather than first preference.

Table 1 about here

Both parametric and non-parametric approaches were applied to estimate willingness-to-pay (WTP). A parametric estimate based on the approach advocated by (Hanemann, 1984; Hanemann et al., 1989) arrives at a mean estimate for the first payment question of €55.17 per person per year (median €49.16) for the first bid and €84.08 for the combined bids after truncation of a single very high bid. The corresponding non-parametric mean estimate based on the first bid is €55.87 per person per year.

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:

$$\Pr(\text{YY}) = 1/1+e^{(\alpha + \beta \text{BIDU})}$$

$$\Pr(\text{YN}) = 1/1+e^{(\alpha + \beta \text{BIDu})} - 1/1+e^{(\alpha + \beta \text{BIDl})}$$

$$\Pr(\text{NY}) = 1/1+e^{(\alpha + \beta \text{BIDl})} - 1/1+e^{(\alpha + \beta \text{BIDL})}$$

$$\Pr(\text{NN}) = 1/1+e^{(\alpha + \beta \text{BIDL})}$$

where Bid1, BidU, and BidL stand for the initial bid level, the upper bid level and lower bid level respectively.

In this case, the final combined parametric mean WTP is €72.92 per person per year. For the National Survey, the non-parametric estimate of €56.23 was deemed more acceptable given the extended distribution tail. While not a significant problem for Cutaway Survey, the respective non-parametric estimate was considerably higher at €79.92

3.2 Choice experiment

The choice experiment was intended to throw light on the preferred composition of a peatland park. The attributes included in the experiment are listed in Table 1.4.

Table 2 about here

Respondents' support for a park is revealed through significant coefficients for the respective alternative specific constants compared with the third do-nothing scenario. Unfortunately, a multinomial model is only a weak improvement on a constants only model. The attribute levels Time (25 years), Wildlife (easy to view) and Activities (many) are significant, but the parameter values suggest that their influence is weak. 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) is significant and positive while *Peat* (no cutting) 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. Altogether, the result appears to suggest that, while most respondents would value a peatland park, they favour continuation of an activity that damages peatlands or that a park should only become established once the peat deposit is exhausted.

The significance of the model is greatly improved once *Price* is included as a covariate and protest bidders are excluded.² Although there is a high degree of variation in WTP values, price levels have been taken from the preceding WTP and are not a product of a factorial design as for the other attributes. Price also remains constant between the park alternatives.³ In this new model, *Price* is highly significant, but its inclusion occurs at the expense of a loss of significance for other covariates with the exception of Peat and Wildlife.

A plausible reason for the loss of attribute significance would be that there is no general agreement of how a park should look, namely that there is heterogeneity of preferences which is partially obscured by the more consistent response to Price. Mixed logit allows us to distinguish between the uncorrelated random error and the random term that can be explained by additional parameters such as socio-demographic variables. In this way, it can be used to identify how preferences vary between respondents and respondent types. Once applied to the data, mixed logit restores the significance of some of the former attributes and reveals a residual significant standard deviation in relation to Activities (many), Peat (household and industrial cutting) and Rarity (many). However, the coefficient for Peat (no cutting) remains distinctly negative.

Table 3 about here

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 to a mean of €57.69 in the case of the Park Survey compared with just €15.54 per person per year for the National Survey. In principle, the result fails to pass a scope test as both surveys dealt with the protection of peatlands. People should be willing to pay more for a national policy of protection than a local one.

² Log-likelihood of -1604.58 compared with 1456.46

³ While it may have been possible to include attribute levels suggesting proportional changes to price, but respondents had already been asked for their maximum WTP in the CVM question.

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, a park may be considered by respondents to be a more tangible product, especially where they are living in or near the region concerned. A policy of peatland protection appears more nebulous (at least without describing the policy in more detail than can normally be accommodated in a face-to-face survey). Indeed, the National Survey attracted a higher proportion of protest bids including respondents who were “not convinced” the protection would occur (14.4% of zero bids).

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 less support for the former. Neither is the preference for continued household cutting ubiquitous. An analysis of interactions does indicate a predictable positive interaction between a preference for continued household cutting and actual peat cutting by the respondent as well as a negative interaction between this attribute level and higher social class or interest in the environment. Nevertheless, overall, a significant negative value for Peat remains. It could be that many respondents, including local people and peat cutters see no contradiction between peat cutting and restoration of the bog. Certainly, amongst the earlier questions, there is a correlation between being a peat cutter and the importance placed on landscape, both as a motivator of environmental interest (Question 2) and as a policy perceived to be important (Question 3). Peat cutters also placed a high value on wildlife as a motivator of environment interest.

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 for a landscape of peatland restoration. By comparison, no clear pattern was apparent for those respondents generally who considered peatlands to be more important as heritage.

Table 4 about here

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 (1995) and (Gunderson et al., 1997) et al. (1997) in which people conceive of the environment as benign, balanced and resilient. To a degree, this is true of peatlands harvested by traditional hand cutting on a small-scale. Overall, though, the peatlands are not resilient ecosystems and any such view represents a denial of the damage done by modern mechanical cutting. Moreover, while cutover peatlands, and even cutaway (Farrell and Doyle, 2003), can be restored, the process involves extensive re-wetting and blocking of drains. It is expensive and unlikely to allow badly degraded peatlands to return to their original pristine state within any meaningful human time-frame, particularly where raised bogs are concerned. It is possible that some respondents are under the impression that peatlands are a renewable resource. This may also have been a reason for a preference for a medium time-scale in the survey, so allowing for continued cutting in the respondent's lifetime. On the other hand, the greater volume of evidence from our discussions with peat cutters and local people is that there is an acceptance that industrial peatlands are nearing the end of their productive life. Indeed, the view was often expressed that the bogs should be allowed to return to a more natural state. However, household cutting was not included in this assessment. Rather, our interviews often revealed 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, 2009b). Of course, resentment amongst rural communities to outside interference by conservation agencies is not uncommon (see (Fjellstad et al., 2009)).

5. Implications for policy

Conservation policy to date has involved cajoling peat cutters into accepting compensation in return for either abandoning turbarry rights or for withholding from cutting. So far, the policy has been voluntary, but in response to the EU Habitat Directive, government is now proposing to make acceptance of compensation

a requirement for turbarry rights holders on 32 bogs that have been designated as being of high conservation status.

To date, the strategy of compensation has not been very successful. Turbarry owners have been unwilling to give up long-held rights. Doing so involves both an economic cost (in terms of the purchase of more expensive heating fuels) and a social cost (given existing cooperative institutions through which the peat is harvested). Rather, compensation has most often been accepted by those rights holders who have already excluded themselves from active peat cutting.

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 many local people regard as being far more environmentally damaging than their own smaller scale low-tech activity despite its own damage to the peatland water-table. 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 more interested in “rare bugs” than the needs of local people.⁴ The concept of the cultural landscape in which landowners play an active part, may be relatively novel, but it is well understood by a government that has been reluctant to implement European environmental legislation in relation to protected peatlands.

The conservation agencies, for their part, could be accused of failing to recognise that their perspective is not always recognised as legitimate by those most closely associated with the resource (Clark and Murdoch, 1997; Collier and Scott, 2009a; Harrison and Burgess, 1994). For this particular resource, it is not a case that turbarry holders have some unique understanding of peatland management and ecology that the agencies would do well to learn. Rather, the agencies would be advised to extend their interaction with peatland communities beyond the “passive participation” (Pretty, 1995) attempted to date (Collier and Scott, 2009b). For, 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 exist in rural communities (Jones, 2003). The risk that insensitive conservation policy could provoke local self-organisation and opposition by failing to comprehend property rights and political realities has been noted in other rural resource situations (Gerber et al., 2009; Scharpf, 1994).

⁴ For examples note Irish Examiner 20/3/08, An Phoblacht (27/8/09), Roscommon Herald (23/9/09),

Based on the survey results, it would appear that both peatland communities and many within 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. Moreover, many peat cutters appear to value landscape and wildlife more highly than the wider public. Altogether one is given the impression of there being a way forward for peatland management. Clearly, peatlands are valued as a cultural landscape even where the concept itself is not articulated.

The way forward is not obvious. Commonage Framework Plans applied to grazing areas in Ireland are one template. Under these agreements, sheep farmers receive compensation in return for collectively devising a management regime that caps grazing pressure on common land. The Framework Plans involve cooperative arrangements and preserve property rights. They restrict over-use in circumstances where players vary in the extent to which they gain or lose out from such arrangements and where others may be sceptical of a resource problem in the first place. On the other hand, the social system relevant to peatlands is not very flexible and turbary holders are not accustomed to the likes of agri-environmental payments. Neither is the peatland ecology resilient to change except at very low levels of peat extraction. Nevertheless, a similar mechanism could be applied to peatlands while accepting that the complexities and sensitivities require adaptive management (Holling, 1978, Gunderson, 1999).

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 is beginning to be acknowledged. The challenge is to harness that value. Peatlands are no longer viewed as wastelands (Andrews, 1982) by either local communities or the wider public.

Therefore, there is merit in informing people about the vulnerability of peatlands and the manner in which 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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6. References

- Adger, W.N., 2000. Social and ecological resilience: are they related? *Progress in Human Geography* 24, 347-364.
- Alumäe, H., Printsman, A., Palang, H., 2003. Cultural and historical values in landscape planning: locals' perception, in: Palang, H., Fry, G. (Eds.), *Landscape Interfaces: Cultural Heritage in Cultural Landscapes*. Kluwer Academic Publishers, Dordrecht, pp. 125-145.
- Andrews, C.S., 1982. *Man of no property*. Mercer Press, Dublin.
- Aronson, J., Milton, S.J., Blignaut, J., 2007. Restoring natural capital: definitions and rationale, in: Aronson, J., Milton, S.J., Blignaut, J. (Eds.), *Restoring Natural Capital: Science, Business, and Practice*. Island Press, Washington, pp. 3-16.
- Buijs, A.E., Pedroli, B., Luginbuhl, Y., 2006. From hiking through farmland to farming in a leisure landscape: changing social perception of the European landscape. *Landscape Ecology* 21, 375-389.
- Byrne, K.A., Cabral, R., Pöllänen, M., Farrell, E.P., 2007. Natural regeneration, in: D., W., P., F.E. (Eds.), *CARBAL. Carbon gas balances in industrial cutaway peatlands in Ireland*. University College Dublin, p. 9.
- Clark, J., Murdoch, J., 1997. Local knowledge and the precarious extension of scientific networks: a reflection on three case studies. *Sociologia Ruralis* 37, 38-60.
- Collier, M., Scott, M., 2009a. Conflicting rationalities, knowledge and values in scarred landscapes. *Journal of Rural Studies* 25, 267-277.
- Collier, M.J., Scott, M., 2009b. Conflicting rationalities, knowledge and values in scarred landscapes. *Journal of Rural Studies* 25, 267-277.
- Collier, M.J., Scott, M., 2010. Focus group discourses in a mined landscape. *Land Use Policy* 27, 304-312.
- Collier, M.J., Scott, M.J., 2008. Industrially harvested peatlands and after-use potential: Understanding local stakeholder narratives and landscape preferences. *Landscape Research* 33, 21.
- Council of Europe, 2000. European Landscape Convention, in: Strasbourg (Ed.). Council of Europe, Strasbourg, p. 25.

- de Groot, W.T., 2006. From friend to enemy and onwards: an evolutionary perspective on the people-nature relationship, in: In R.J.G. van den Born, R.J.G., Lenders, R.H.J., de Groot, W.T. (Eds.), *Visions of Nature*. LIT Verlag, Berlin, pp. 19-40.
- Déjeant-Pons, M., 2006. The European Landscape Convention. *Landscape Research* 31, 363-384.
- Farrell, C.A., Doyle, G.J., 2003. Rehabilitation of industrial cutaway Atlantic blanket bog, NW Mayo, Ireland. *Wetland Ecology and Management* 11, 21-35.
- Feehan, J., O'Donovan, G., 1996. *The Bogs of Ireland: an introduction to the natural, cultural and industrial heritage of Irish peatlands*. The Environment Institute / University College Dublin, Dublin.
- Fjellstad, W., Mittenzwei, K., Dramstad, W., Ovren, E., 2009. Landscape protection as a tool ofr managing agricultural landscapes in Norway. *Environmental Science and Policy* 12, 1144-1152.
- Gerber, J.-D., Knoepfel, P., Nahrath, S., Varone, F., 2009. Institutional resource regimes: Twoards sustainability through the combination of property-rights theory and policy analysis. *Ecological Economics*, 798-809.
- Goodwin, P., 1998. 'Hired hands' or 'local voice': understandings and experience of local participation in conservation. *Transactions of British Geographers* 23, 481-499.
- Gunderson, L., Holling, C.S., Peterson, G., Pritchard, L., 1997. Resilience in ecosystems, institutions and societies, in: *Economic, B.I.I.f.E. (Ed.), Beijer Discussion Paper Number 92*, Stockholm, Sweden.
- Hammond, R.F., 1981. *The Peatlands of Ireland*, Soil Survey Bulletin. Teagasc, Dublin.
- Hanemann, W.M., 1984. Welfare evaluations in contingent valuation experiments with discrete responses. *American Journal of Agricultural Economics* 66, 332-341.
- Hanemann, W.M., Loomis, J.B., Kanninen, B., 1989. Statistical efficiency of double-bounded dichotomous choice contingent valuation. *American Journal of Agricultural Economics* 73, 1255-1263.
- Harrison, C.M., Burgess, J., 1994. Social constructions of nature: a case study of conflicts over the development of Rainham Marshes. *Transactions of the Institute of British Geographers* 19, 291-310.
- Holden, J., 2005. Peatland hydrology and carbon release: why small-scale process matters. *Philosophical Transactions of the Royal Society of London. Series A* 363, 2891-2913.
- Jones, P., 2003. Urban regeneration's poisoned chalice: is there an impasse in (community) participation-based policy. *Urban Studies* 40, 581-601.
- Joosten, H., Clarke, D., 2002. *Wise Use of Mires and Peatlands: background and principles including a framework for decision-making*. International Mire Conservation Group / International Peat Society, Finland.

- Knoepfel, P., Nahrath, S., Varone, F., 2007. Institutional regimes for natural resources: an innovative theoretical framework for sustainability, in: Knoepfel, P. (Ed.), *Environmental Policy Analysis*. Springer, Berlin, pp. 455-506.
- Last, K., 2006. Heritage and identity: the challenge of landscapes to the nature/culture dichotomy, in: Sassatelli, M. (Ed.), *Landscape as heritage: negotiating European cultural identity*. European University Institute, Robert Schuman Centre for Advanced Studies, Florence, pp. 9-17.
- MEA, 2005. *Millennium Ecosystem Assessment. Ecosystems and Human Well Being: Synthesis Report*. Island Press, Washington.
- Mitsch, W.J., Gosselink, J.G., 2000. *Wetlands: Third Edition*, Third ed. John Wiley and Sons, Chichester.
- Moore, P.D., Bellamy, D.J., 1974. *Peatlands*. Elek Science, London.
- Olwig, K.R., 2007. The practice of landscape "Conventions" and the just landscape: the case of the European landscape convention. *Landscape Research* 32, 579 - 594.
- Ostrom, E., 1986. An agenda for the study of institutions. *Public Choice* 48, 3-25.
- Parish, F., Sirin A., Charman, D., Joosten, H., Minayeva, T., Silviu, M., 2007. *Assessment on Peatlands, Biodiversity and Climate Change*. Global Environmental Centre / Wetlands International, Kuala Lumpur.
- Pretty, J.N., 1995. Participatory learning for sustainable agriculture. *World Development* 23, 1247-1263.
- Scharpf, F.W., 1994. Games real actors could play: positive and negative coordination in embedded negotiations. *Journal of Theoretical Politics* 6, 27-53.
- Silins, U., Rothwell, R.L., 1998. Forest peatland drainage and subsidence affect soil water retention and transport properties in an Alberta peatland. *Soil Science Society of America Journal* 62, 1048-1056.
- Wheeler, B.D., Shaw, S.C., 1995. *Restoration of Damaged Peatlands: with particular reference to lowland raised bogs affected by peat extraction*. HMSO, London.
- Wilson, D., 2008. *Carbon Fluxes in Irish Peatlands*. Work Package 3.5, BOGLAND Project.
- World Commission on Environment and Development, 1987. *Our Common Future*. Oxford University Press, Oxford.