

# **Valuing our Environment**

## **Economic Impact of the National Parks of Wales**

**A report to the  
Countryside Council for Wales  
on behalf of the  
Valuing our Environment Partnership**

**by**

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# 1 Executive Summary

This study takes forward the implementation of the Valuing our Environment (VoE) methodology to investigate the economic impacts of the environment in the National Parks of Wales. The method was applied first at a national scale in Wales by Bilsborough and Hill (2002) and at a regional level by Hill and O’Sullivan (2003). Estimation in each of these studies used the Wales national input-output tables. In the initial application the use of the tables to estimate the economic impacts of environmentally linked activity raised relatively few issues. Subsequently disaggregating to the regional level however raised conflicts with assumptions in the multiplier methodology which could not be supported in a further ‘drilling down’ to the scale of National Parks.

The three National Parks of Wales may in landscape or environmental terms constitute a suite. Economically they can be considered so. Given the special nature of the Parks the range and type of economic activity is limited. As a result the internal economy is different from the wider economy not only in scale but also in shape. Each Park has limits to its internal economy and must trade with the rest of Wales. Further, given the scale, and therefore relative simplicity of the economy of the Parks compared to the national economy it is possible to identify foci of activity. These conditions indicate the application of a gravity based input-output model used here to be preferred. It accounts for the scale of the economy under investigation, minimises the contradiction of assumptions noted in previous studies, does not have the inherent inaccuracies of other scaling methods (such as location quotient) and estimates in and out of Park indirect effects. The method uses the National Tables as a starting point and modifies these with local data on employment and centres of gravity. It overcomes the cost restraints of bespoke surveying. It is therefore cost-effective and, of the non-survey alternatives the most accurate estimator. Coincidentally the reason for the enhanced precision also provides greater information.

The estimations for the National Parks show they make a considerable contribution to the economy of Wales:

- Economic activity linked to the environment in the NPs make a considerable contribution to the economy of Wales; 11,926 jobs and incomes amounting to £176.82million.
- The original VoE study found 1 in 6 (17%) of Welsh jobs are linked to the environment, in the NPs this rises to more than twice that rate, to over 38%.
- Much of the difference is seen in the dominance of those sectors which use the environment (mainly agriculture) and those which depend on quality of the environment (mainly tourism related sectors).
- Total direct employment relating to the environment of the National Parks of Wales amounts to 10,255 jobs.
- Indirect employment for the three National Parks is 1,671
- 17% of indirect employment is within the National Parks, more than four fifths (83%) of indirect employment occurs outside of the National Parks.
- Together the three NPs of Wales generate considerable income, direct income is £146.75millions, a further £30.07 millions of indirect income is generated; £2.74millions within the parks and £27.33millions to the rest of the Welsh economy. Only 9% of the indirect incomes are retained within the NPs, 91% of indirect incomes are made outside of the NPs.

There is considerable variation across the Parks. Pembrokeshire is strongly tourism based and, due to shape and location of the Park has the largest impact of any park outside its boundaries. Fully 93% of the indirect employment of PCNP occurs outside of its boundaries compared to 74% in the Brecon Beacons and 67% in Snowdonia. In short the particular conditions of PCNP result in a great deal of porosity of its boundaries; employees, goods and services can easily travel in and out of the Park. The halo effect is strongest around PCNP.

The suite of parks covers some 20% of Wales yet contributes only 9% of environmentally linked GDP. However it is evident that productivity per employee in the National Parks is greater than outside the Parks. Productivity is linked to total employment. Of the three parks the employment/km<sup>2</sup> in PCNP is closest to that of the rest of Wales. As a result PCNP is the only park which has similar productivity/km<sup>2</sup> to Wales as a whole. The reasons for this low contribution are largely demonstrated in Brecon Beacons and Snowdonia where employment per km<sup>2</sup> is considerably lower than the rest of Wales.

There is considerable evidence to suggest that much of the economic impact of the National Parks is displaced. While this displacement, largely to the halo or doughnut around the Park, is identifiable in PCNP it is not clear in the cases of Brecon Beacons and Snowdonia.

Geographically both are similarly shaped and located, larger area to boundary than PCNP, large rural hinterlands and one edge abutting communications towards urban areas. Economically both have a more even split of employment between agriculture and tourism and are relatively self contained. While visitor numbers, particularly to Snowdonia are considerable, spending per person is low. Visitors to the Park include large numbers of people making single day visits as part of a longer stay in Wales. Around 80% of visitors to Wales cite the quality of the environment as a reason for their visit. While the National Parks undoubtedly have a role in this, however the economic benefits are more likely to occur at the place of accommodation outside of the Park. Likewise Brecon Beacons are a traditional day visit location for South Wales residents, the economic benefits are more likely to occur at place of residence.

The Parks offer other less tangible economic benefits such as icon for tourism and brand image for Welsh goods and services.

Despite the difficulty in capturing all of the economic impacts this study finds that GDP is not a poor measure of environmentally linked economic activity for two reasons. Firstly, the differences between the economies of each Park are clearly illustrated and substantiated. A poor measure would be unable to illustrate this as clearly. Secondly, the appearance of productivity in the Parks that is lower than the rest of Wales is misleading. Productivity per person is higher in the parks than outside. This is likely an effect of the self sufficiency due to location and of the sectors in the parks. Productivity of the parks, in terms of area covered, is largely a function of lower than average employment rates; the density of employment is greater in urban than rural areas. Again this supports the use of GDP as a consistent measure to compare environmentally linked productivity to all other economic activity.

The economic impacts found in this study are substantial. Therefore it is heartening to see that the National Park designation is not the restriction of development it is

often assumed to be. In addition to these substantial contributions, there is substantial evidence which suggests there are further economic benefits which accrue from, but are not captured by, the economies of the National Parks. This study concludes that the designation of National Park, which ensures the quality of the environment in these beautiful places, is not a restriction on economic activity and, in fact, may be useful in promoting such activity.

## NOTE ADDED BY THE VALUING OUR ENVIRONMENT PARTNERSHIP

Since receipt of this report from the consultants, partners to the study have sought clarification of the differences between the results of this study and the Scarborough Tourism Economic Activity Monitor (STEAM) research. This note sets out the differences – which are because they:

- measure different things
- use different methods
- use different data sources
- use different assumptions,
- use different definitions.

	STEAM	Valuing our Environment
The headline figures are:	<ul style="list-style-type: none"> <li>• total visitor expenditure with a NP within a year</li> <li>• estimates of employment dependent on that expenditure.</li> </ul>	<ul style="list-style-type: none"> <li>• environmentally-related employment in defined sectors in NPs</li> <li>• environmentally-related income to defined sectors in NPs</li> <li>• environmentally-related GDP of defined sectors in NPs.</li> </ul>
Designed to:	<ul style="list-style-type: none"> <li>• provide an indicative base for monitoring trends of tourism in a local area.</li> </ul>	<ul style="list-style-type: none"> <li>• be an accurate statistically estimated input-output model of the local (environmentally-related) economy.</li> </ul>
NOT designed to:	<ul style="list-style-type: none"> <li>• provide a precise &amp; accurate measurement of tourism in a local area.</li> </ul>	<ul style="list-style-type: none"> <li>• report total visitor expenditure</li> <li>• report on ‘tourism’ as a separate sector.</li> </ul>
What they measure:	<ul style="list-style-type: none"> <li>• Visitor numbers</li> <li>• Visitor days</li> <li>• Total visitor expenditure</li> <li>• Employment dependent on expenditure</li> </ul>	<ul style="list-style-type: none"> <li>• Environmentally-related employment in defined sectors in NPs</li> <li>• Environmentally-related income to defined sectors in NPs</li> <li>• Environmentally-related GDP of defined sectors in NPs</li> </ul>
Scoping of tourism impacts:	<ul style="list-style-type: none"> <li>• Accommodation</li> <li>• Food and drink</li> <li>• Recreation</li> <li>• Shopping</li> <li>• Transport</li> <li>• Indirect expenditure</li> <li>• VAT</li> </ul>	<ul style="list-style-type: none"> <li>• Tourism not included as a separate sector</li> <li>• Most relevant sectors: Hotels, bars &amp; restaurants  Recreation, culture &amp; welfare.</li> </ul>
Method based on:	<ul style="list-style-type: none"> <li>• Estimated visitor numbers</li> <li>• Estimated visitor expenditure</li> <li>• Estimated multipliers</li> </ul>	<ul style="list-style-type: none"> <li>• Employment figures from Annual Business Inquiry data supplemented by original survey work</li> <li>• Welsh Input-Output model</li> </ul>
Source of data:	<ul style="list-style-type: none"> <li>• Day visitors: UK Day Visitor Survey 1994 baseline supplied by BBNP</li> <li>• Expenditure: South Wales Visitor Survey 2000-01 (rural)</li> <li>• Multipliers: Scottish Tourism Multiplier Study</li> </ul>	<ul style="list-style-type: none"> <li>• Annual Business Inquiry data supplemented by original survey work</li> <li>• Welsh Input-Output model</li> </ul>

## 2 Introduction: developing the Valuing our Environment approach

The original Valuing our Environment (VoE) report (2001) comments on the quality of the environment as a key strength and a major asset of the country. It cites as evidence, among others, the range and coverage of international and national landscape, nature conservation and built heritage designations.

The environment is appreciated for its intrinsic appeal and contribution to quality of life. Economists have long been able to estimate values for these non-market goods. However, while these estimates offer insight into the scale and location of appreciation they are not closely linked to the other conventionally employed economic measures such as GDP, nor do they take into account the input of the environment to the economy.

The original *Valuing our Environment* study employed the conventional measures in an assessment of the economic contribution of the environment whilst acknowledging the problems of GDP, which does not account for social and environmental externalities, and the existence of measures which do (such as ISEW; see Midmore & Whittaker 2000; Munday *et al.*, 2002). Both the direct and induced effects on employment, output, GDP and income to labour were estimated using the 1996 Welsh Input-Output Tables and, largely, secondary data sourced from appropriate organisations.

Those appropriate organisations were identified in the VoE framework through the adoption of three categories based on their relationship with the environment:

- Activities concerned with the protection and enhancement of the environment
- Activities that make intensive use of one or more elements of the environment as a primary resource
- Activities which are dependant on the quality of the environment.

Employing these categories in the Standard Industrial Classification (SIC) based Welsh Input-Output tables drives several unsubstantiated assumptions, namely that:

- Environmental based outputs match the outputs for the appropriate sector
- The distribution of spending on inputs in the environmental activities matches the sector average
- Marginal impacts equal average impacts.

Furthermore there are difficulties in mapping the environmental sourced data to the Input-Output tables which necessitated some “*arbitrary judgements*” (Bilsborough & Hill, 2002; 24).

The contribution of the environment to the economy was found to be substantial: 1 in 6 of Welsh jobs and around 9% GDP are linked to the environment.

Subsequent analysis of the spatial distribution of the VoE findings, based on the Welsh Assembly Government’s (WAG) economic regions, was undertaken by Hill and O’Sullivan (2003). Disaggregation raised three major issues.

First, there were problems in deriving regional estimates that were compatible with the three defined environmental relationships in the VoE framework; the boundaries

of organisations did not coincide with the WAG regions. Despite attempts to obtain primary data from the organisations in the original study, progress was inhibited by organisations' national remits and data management, and disparities in the regional boundaries employed and data management of the organisations inhibited progress. The NOMIS dataset and the "*authors own estimates*" (Hill & O'Sullivan, 2003; 9) were used to adjust data.

Secondly, it was necessary to assume, given the use of Wales Input-Output model, that productivity was constant within sectors across the regions. In other words, while inter-sector differences existed, productivity within a sector would be independent of location.

Finally, a fundamental assumption in multiplier estimation is 'leakage'. On a national scale (Welsh for example) the leakage is from the national economy; inter-regional trade is not considered. Disaggregating the data, while using national multiplier estimates, results in errors because part of the local (economic region) effects will be apparent in other regions within the country. In short the inter-regional trade, unimportant at the national scale, may be a considerable element of regional multipliers.

A recent economic impact assessment using the WAG economic regions conducted by SERS found significant regional differences in local (within region) multiplier coefficients but no significant difference in the national (inter-regional) multipliers (SERS, 2005). Thus the propensity to consume locally was seen to vary across Wales. Associated qualitative research suggested underlying causes to the propensity to consume locally: the desire to do so and the facility to do so. Similar effects are seen in the VoE Regional Analysis, the availability of goods and services is a critical factor which varies across the regions. These issues notwithstanding, the authors of the Regional Analysis suggest their estimates are not implausible. Whilst plausibility is not questioned, there is some loss of information implied in the assumption of within sector independence to location.

The next phase of implementation of the VoE framework, and the subject of this study, is "to 'drill down' into specific areas of Wales to demonstrate at a local level the strength of the relationship between the quality of the environment and the economy" In this there are four project aims:

- Objective 1. To determine, for the three Welsh National Parks following the VoE framework, the environmentally related output and its contribution to Welsh GDP, environmentally related direct employment, indirect employment and aggregate value of incomes of those in environmentally related work.
- Objective 2. To report those results within the wider context of the measurements of sustainable development, particularly the Welsh ecological footprint and Welsh ISEW
- Objective 3. Using existing case studies, illustrate the following: the intangible personal benefits associated with the environment, the value of ecosystem services; issues of social justice and the health and well being associated with the natural environment.
- Objective 4. To recommend alternative indicators to better capture the contribution made by National Parks to Sustainable Development

### 3 Assessment of appropriate methodologies

The shift in previous projects from national to regional investigations uncovered the issues discussed above. The study team recognised that focusing on smaller regions may exacerbate those issues. Furthermore, the interchange of goods and services across National Park boundaries adds a similar level of complexity to the inter-regional exchanges of the VoE regional analysis but they are likely to be of relatively greater significance. Thus the focus on National Parks concomitantly raises issues and offers opportunities of solutions.

- The simplified boundaries and limited trade between National Parks (NPs) indicates that the issue of mapping the regions is at least partially negated
- The reduced scale and simplified boundaries permit a meaningful proportion of primary data to be collected
- Data from the NP survey may be used in the Wales Input-Output model as previous surveys
- Given the proportion of primary data, locally weighted multipliers may be estimated which may go some way to addressing the unproven assumption that productivity within a sector is independent of location.

The issues outlined in the previous VoE studies are well known; transferring national level Input-Output tables to sub divisions of the nation are the subject of a comprehensive literature. In summary, the costs of unique surveys to derive local tables can be prohibitively large, thus there is an 'industry' concerned with the production of regional tables without conducting a survey (for example Flegg and Webber, 2000). The simplest of these is the Simple Location Quotient (SLQ) model. There are four necessary assumptions to obtaining accuracy in an LQ approach:

- identical productivity per employee in each region;
- identical consumption per employee of the products of an industry in the nation and region;
- no 'cross-hauling' between regions and
- the nation is neither a net exporter nor importer of a product (i.e. production and consumption balance).

Clearly these are difficult to uphold and necessitated many of the assumptions in the VoE regional analysis. The LQ method has been developed to produce various functional forms. However none fully address the issues and may produce misleading results (Tohmo, 2004).

Hybrid models, using limited survey data, modify the national Input-Output tables to the local economy. However it is assumed that the 'shape' of the two is similar; the assumption may hold for regions which have sufficient diversity and volume of economic activity but not for smaller and specialised economies. A further development used to address these issues is the gravity model which consider the impedance to flows between regions; that is the flows between two locations. Given the nature of the economies of National Parks (i.e. it is unlikely to have a similar shape to the national economy), the issues raised in the VoE regional analysis and the

opportunity to obtain partial primary data then the gravity model approach is appropriate and has been applied here.

The initial Valuing our Environment study incorporated the multiplier relationships for economic activity based on the ecology and landscape of Wales. These contributions, based on the purchases from industries and business supplying the environmentally-related activities and in turn the industries and businesses supplying them, and so on, contributed a significant portion of the overall valuation. These were based on an input-out model of the Wales economy for 2000 (Bryan *et al.* 2004). The subsequent sub-regional study of the environmental contribution used a similar input-output approach based on input-out model for each WAG economic region (Hill & O'Sullivan, 2003), and the multipliers in this case were those existing within each economy. For the Welsh National Parks, however, this approach poses something of a problem; in economic terms, their areas are relatively very small, and highly specialised. This means that internal economic linkages are very weak, although linkages between the National Parks and the economy outside (transactions with industries and businesses in the rest of Wales) are much stronger. Thus, to accurately reflect the contribution that the National Park environments are making to the Wales economy, a slightly more complex modelling approach is required.

This involves a technique known as inter-regional input-output modelling, first suggested in the 'ideal' model of Walter Isard (1960). This system identifies the transactions flows between both industries and regions, and thus shows the multiplier effects of incomes and employment created directly in one region, and the indirect impacts created by linkages both within the region and in other regions in the system. It is called ideal because it is based on accurate observations of trade flows both within and across the boundaries of the regions or areas which are distinguished in the model.

## 4 The Gravity Modelling Method

Extensive survey activity of a scale suitable to develop an area specific input-output model is expensive and beyond the scope of this study. Alternative methods of estimating sub-regional input-output accounts on which such models are based are disappointingly inaccurate (Round 1983), although Jensen *et al.* (1990) have shown that a combination of survey information of major transactions combined with alternative methods of estimating minor transactions provides an effective trade-off. Also, recent applications of a gravity modelling approach to trade between regions have proved to be a promising method of estimating the actual flows. This involves developing an equation in which the trade flow of a product or service between one region and another depends on their relative sizes as, respectively, producers and consumers, and the cost of transport between them (usually based on the physical distances involved). Cogentsi Research International Ltd have developed an inter-regional input-output gravity-based modelling system for Scotland (for an example of its use, see Radford *et al.* 2004), and it has been shown to be relatively accurate when compared with other techniques, benchmarked against a fully survey-based approach.

### 4.1 Application

The procedure adopted for this study draws on this body of work. Starting with the combined use transactions matrix for the Wales economy as a whole, which shows the purchases of 74 separate industrial sectors regardless of source, it has been partitioned into four separate regions: the Brecon Beacons, Pembrokeshire Coast and Snowdonia National Parks, and the rest of the Wales economy, using data from the Annual Business Inquiry provided by Nomis. Some data limitations, and the absence of some sectors in the National Parks, required the 74 Wales sectors to be aggregated into 42 sectors. This provided levels of consumption and production in each sector to be identified, and the gravity equations were used to estimate the trade flows of sectors between regions. The identification of a supply pool originating from different areas, including that from the local area itself, was checked in interviews carried out with key business sector informants in each National Park. The overall level of imports into Wales from the rest of the United Kingdom and from international sources provided a further check on the source of inputs used, and the bi-proportionate balancing method provided an internally consistent account of the economic interdependence between these four regions of Wales (the three National Parks and the rest of Wales).

There are some overall limitations of the input-output approach (described, for example, in Midmore 1993), which mean that where there is an increase in output, income and employment, the indirect effects of this may be over-estimated, and vice-versa in the case of a decrease. Subject to this, the framework can account for the proportion of a multiplier effect originating within each local area, and that transmitted to each of the other areas described in the modelling system. For the purposes of this study, it is important to show the local, or intra-regional, multiplier associated with environmental activity in each National Park, and the inter-regional multiplier which reflects the impact of that activity in all other areas of Wales (including the other National Parks, although this effect is of little significance).

## 4.2 Data: initial model

Initial data used in the first estimate of the input-output model is sourced from the Annual Business Inquiry (ABI) provided by Nomis. The smallest scale of ABI reporting is Wards. Unfortunately, for the aims of this survey, those wards do not map precisely with the National Park areas. The problem is less acute in Brecon and Snowdonia; both map reasonably well; few wards cross the boundaries. Where wards overlap the boundary the problems caused are minimal for two reasons. First, the wards concerned cross into largely rural areas of similar type to the National Park. It is unlikely that any differences delineated by the NP boundary occur abruptly; an area outside the NP but close to the boundary is in all likelihood little different to one similarly located but within the boundary. This issue is further examined in the case studies. Second, the proportion of the area of Nomis wards located outside the boundaries is consistently small.

While these conditions serve to minimise any lack of precision they are not in themselves sufficient to assume the data is unaffected. There is, however, no precise baseline from which to assess the accuracy of the data. Given this lack, the sensitivity of the data was assessed. Limited sensitivity (small changes in the data due to changes in the area estimated) would indicate that limits on the precision of the mapping do not unduly disturb the data. The degree of data precision in relation to imprecise mapping was assessed in two ways

The first round of estimates was conducted using only the Nomis sourced data. The initial estimate used all of the wards which coincide with the NP area. Where wards The second type of estimate attempted to address the issue of overestimating; where a ward extended outside the NP boundary, an adjacent ward of approximately similar area to that outside the boundary was omitted from the search. Thus the workforce was estimated in an *area* similar to that of the NP but not precisely mapped to the boundary of the NP. This process was repeated using the various combinations of replacement wards to give a range of estimates of the workforce in an area similar to but not precisely coinciding with the NP area.

The second round of estimates involved use of the All Fields Postcode Directory (APFD) supplied by the Office for National Statistics. This service links current and previously terminated postcodes to administrative, health, statistical and other areas; including NPs. Similar to the Nomis wards, however, there is a degree of mismatch in mapping post code area boundaries with the NP boundaries. Helpfully the APFD differentiates between postcodes wholly within the NPs and those which cross the boundary. This facilitated a search for significant employers within those cross boundary postcodes and elimination or inclusion from the data as appropriate.

The end result is a series of estimations:

- A *maximum* estimate made using all Nomis wards; this method overestimates the NP area and consequently overestimates employment to a similar degree
- A series of estimates made using replacement wards; this gives estimates of a similar area to the NP but not precisely mapped to the boundaries of the Park.
- Modification to the above series based on the treatment of significant employers according to their location in respect of the NP as determined by postcode

The figures used in estimation are the mean of all these estimates. The boundaries of Snowdonia and Brecon Beacons National Parks mapped closely to the Nomis wards and the variation of the estimates was consequently small. As such the estimation method is proven robust.

Pembrokeshire Coast National Park (PCNP) presents largely as a narrow area following the coastline. The width of this narrow band varies considerably; from narrow sections around Tenby and The Burrows to the northern sections of the park characterised by some broad areas penetrating deeply inland over the Presselis. Unlike Brecon and Snowdonia, few of the Nomis wards map closely to this shape and the problem is repeated in the AFPD. Similar methods to those used in estimating Brecon and Snowdonia NPs were applied. However, where the estimation process for Brecon and Snowdonia began with the largest area (using all wards) the magnitude of overestimation when applying this process to PCNP would be unacceptable. Instead, the estimation process used for PCNP was to build up from the minimum. Firstly, estimates were made using only those wards with more than 75% of their area being national park. Thus several sections of the park were not included in this first estimate. This initial estimate is as a consequence the minimum. Subsequent estimation used the range of methods intended to replicate total area of the NP outlined above (replacement wards, use of postcodes).

This out puts of this estimation process were:

- A *minimum* estimate made using only the Nomis wards of 75% or more in the NP, this method underestimates the NP area and consequently underestimates employment to a similar degree
- A series of estimates made using replacement wards.
- Modification to the above series based on the treatment of significant employers according to their location in respect of the NP as determined by postcode

Despite the mismatch in the mapping of wards and the PCNP boundary consistent estimates were obtained with the combination of replacement ward and postcode methods. The mean of all the estimates was used in further analysis.

### **4.3 Supplementary data**

Nomis sourced data provides, in effect, the raw material from which the input-output model is estimated. Large scale data collection, as mentioned above, is expensive and beyond the scope of this study. However there is a need in this study to supplement the Nomis data with some primary information. In sectors which have both environmentally based and other economic activity quantitative survey data serves to establish the proportion of each.

Furthermore the survey data supplements the Nomis information. For example in terms of the proportion of employees whose places of employment and residence are not both within the NP, in identifying the proportion of goods and services obtained from suppliers within the NP, and to whom they supply their goods and services.

The survey was conducted using a simple questionnaire with both closed quantitative and open qualitative responses. Questionnaire design and interview format was varied as appropriate to the interviewee. Those with demonstrable knowledge and experience of NPs and/or the economic principles of interest to this study were interviewed face-

to-face, given a questionnaire which included an overview of the issues of interest (see Appendix H). Most of these interviewees worked within organisations which have a corporate structure with broad remits or areas of responsibility. The logistics of the interviews were often simplified and number of interviewees maximised by conducting group interviews; one group, for example, contained representatives of Snowdonia NP, Farmers Union of Wales, National Farmers Union, Wales Tourist Board and a local hotelier.

These interviews were recorded. Interviewees of this type were most often acting as representatives of larger organisations such as a NP Authority, a Tourism Partnership or a Farming Union. While such organisations may hold extensive data it is not always readily available. To accommodate this and allow, prior to completing the open questions, some reflection on the matters discussed interviewees were asked to self-complete the questionnaires and return them by post. Furthermore the administrations of organisations rarely recognise the boundaries of designated areas. As a result, most interviewees were unable to give precise numbers but were often confident to state proportions of, for example, budget or employees in the categories of employment. Tourism partnerships were the exception, while able to give figures for their own organisations, themselves a minor component of the industry they are related to, they faced difficulties in providing data, both for their own use and for the purposes of this study, of tourism. Fragmentation, disparate definitions of tourism activity and limited budgets for research were mentioned. Most of the tourism bodies employ standardised multipliers with data often of dubious provenance. Estimates obtained thus vary widely and, as one interviewee mentioned, “...are more a rule of thumb”.

Smaller organisations were interviewed either face-to-face or by telephone. These interviewees included retail businesses, farmers, accommodation providers’, tourist destinations/attractions and other such businesses which have direct contact with clients and/or are unlikely to have a corporate structure. The majority of these interviews were conducted with either the proprietor or manager of the branch. While the quantitative information sought was similar to that from the corporate bodies the technical introduction was omitted. Many of the businesses in this category were SMEs, often with fewer than 5 employees. This produced comprehensive and finely detailed quantitative data for example respondents often knew individual employees well enough to know where they lived and were personally responsible for purchasing of supplies). While these interviews were not recorded the open response questions and comments following the invitation to expand on their answers were noted by the interviewer.

The quantitative data from the corporate and individual interviews have two uses: it supports the input-output derived estimations, and it provides a broader qualitative overview of issues and commentary used in the interpretation of the model outputs.

#### **4.4 Case Studies**

Case studies were intended to illustrate in greater, largely qualitative detail, the issues raised by the quantitative elements of the study; thus the focus of the case studies is informed by- and supports or illustrates the interpretation of previous analysis.

Two rural market towns were selected as case studies, one outside and one within Snowdonia NP. The quantitative data from the corporate and individual interviews have two uses: it supports the input-output derived estimations, and it provides a

broader qualitative overview of issues and commentary used in the interpretation of the model outputs.

While not a comprehensive study of the economic footprint, the case studies sought an impression of the trade flows of both to enable some comparison. The case studies may be thought of as an audit of the towns, in terms of service and sales outlets, the clients and suppliers of those outlets and the proprietor's impressions of the role of the environment on their business. This approach permits some comparison of the impact of a formally designated and more strictly controlled environment and an undesignated, ostensibly less regulated environment on the local economy. The issues and reasons underlying this approach are discussed below.

Methodologically the case studies consisted of six elements;

1. an audit of the town in terms of facilities (retail outlets, infrastructure, communications, surroundings) relating to the quantitative findings. Thus, evidence of the impact of the important sectors was sought; a livestock market, farm supplies outlet would indicate agricultural activity. Likewise, a Tourist Information Office, retail outlets targeting tourists, visitor attractions and accommodation is evidence of tourism. Importantly, the presence and relative scale of sectors which appear less important in the model were also noted.
2. estimates from the providers of services and goods of their customers of the proportion of local customers to visitors and the goods and services those customers purchase
3. estimates from the providers of services and goods in the towns of their suppliers, the proportion of local to distant suppliers and whether these were within the NP.
4. the interviewees impression of the significance of the location, in terms of the proximity of the NP, its rurality, and the local environment to their business
5. the limitations and opportunities to their economic activity the environment endows their business with.
6. brief interviews with a random sample of people in the towns. Interviewees were asked the reason for their visit, whether they were visitors or lived locally. Visitors were questioned on the role of the environment and NP in their decision to visit, residents were asked what impact the environment and NP designation had on their 'economic lives'. 'Economic lives' was explained as the availability of goods and services, prices of those goods and services and the available employment opportunities.

## 5 Results

Clearly the environment has intrinsic value which may be expressed in a number of forms. There are, for example, a suite of accepted (in the UK Government's 'Green Book') technically developed and rigorously scrutinised methods of estimating the value of environmental goods. Termed non-market valuation, these methods create pseudo-markets for the environmental good and so elicit willingness to pay responses. However such values remain hypothetical, there are no actual markets for the transactions to take place, and are therefore not apparent in the conventional measures of economic performance.

Likewise, bodies charged with the management of the environment, among them the NP Authorities, have remits which may have only limited or indirect reference to issues captured in measures such as GDP. For example, PCNP *'The State of the National Park at a Glance'* list of resources includes physical and natural attributes of the park (landscape, biodiversity and so on); the two social elements are limited to 'delivering opportunities for sustainable enjoyment' and 'delivering opportunities for public understanding'. While both are at least contributory to sectors which do capture the values of the environment, such as tourism and in themselves contribute through employment, the assessment for both is based on indicators unrelated to their contribution in terms of employment or other financial measures, they are indirect measures of economic activity. This in itself encapsulates the issue, the National Park Authorities have a duty to provide and maintain a high quality environment but, as public bodies they are not permitted to capture the economic benefits they provide. Paradoxically, the better the quality of the environment they provide and consequently the greater its value, then the greater the gap between the economic performance of provider (the National Park Authorities) and environmentally linked commercial activity. This is due to the greater costs of providing increased quality being borne by the bodies that reap no direct financial benefit. The financial benefits are gained by, say, providers of tourist accommodation who can capitalise the image, attraction and quality of the National Park Environment while bearing only a small part of the cost in tax.<sup>1</sup>

Clearly then the value of the environment according to the above two methods may be recognised and be of considerable magnitude but is not captured in such a way as to enter conventional measures. Rather it is made apparent through the sectors that are able to capture some of this value, whether as protectors or intensive users or as dependents on the environment. It is apparent that within the NPs a few environmentally based sectors are the dominant ones. Their significance is due largely to the numbers employed directly in those sectors (see Table 1).

Table 1 shows the rank, based on total employment within each sector, of the ten largest employers in Wales and in each of the three National Parks. There is little similarity between the dominant sectors of Wales and those of the National Parks. The five largest employment sectors in Wales are Retail, Education, Health, Recreation, Culture and Welfare, and Public Administration. The classification Hotels, Bars and Restaurants is ranked sixth. Of these six sectors, three have some limited connection

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<sup>1</sup> Freeloading is the term used for those who obtain benefits while not contributing to costs. In this example the providers of tourist accommodation are not freeloading in the true sense; however their contribution through tax is minimal, the sum of contributions from other tax payers who do not obtain any economic benefit from their contribution is far greater.

to the categories of sectors related to the environment; for example while some of the resources of Public Administration will be concerned with the environment on a national scale far more will be concerned with other issues. The first Valuing our Environment Report estimated a total of 26,581 public sector employees concerned with the environment, total employment in the sector is an estimated 83,499 (Source: NOMIS); thus approximately 32% of employees in the sector are concerned with the environment. Likewise the Hotels Bars and Restaurants sector for all of Wales is characterised by a more even share of business and commercial visitors than the holiday destinations in which the environment has a role. Indeed, the SW Wales Tourism Partnership report that only around 7% of visitors to SW Wales are on business, a figure which is “...less than Wales as a whole” (SWWTP, 2004-2008). This is also reflected in employment figures, for Wales as a whole the VoE estimate of employment in Tourism and Leisure is 23,600; 32% of the total employment in the Hotels, Bars and Restaurants sector. Agriculture and Fishing ranks as the 16<sup>th</sup> largest employer in Wales.

**Table 1: Rank of 10 largest sectors according to employment rates (Largest = 1)**

Rank	Wales	Brecon Beacons NP	Pembrokeshire Coast NP	Snowdonia NP
1	Retail	Agriculture and fishing	Hotels, bars and restaurants	Hotels, bars and restaurants
2	Education	Recreation, culture and welfare	Education	Education
3	Health	Education	Retail	Health
4	Recreation, culture and welfare	Hotels, bars and restaurants	Recreation, culture and welfare	Agriculture and fishing
5	Public administration	Retail	Construction	Recreation, culture and welfare
6	Hotels, bars and restaurants	Health	Agriculture and fishing	Retail
7	Sub-contract business services	Motor vehicles	Health	Construction
8	Construction	Public administration	Oil processing	Public administration
9	Wholesale	Mechanical engineering	Wholesale	Wholesale
10	Motor vehicles, sales and repair	Motor vehicles, sales and repair	Other land transport	Motor vehicles, sales and repair

Considered as a suite, the National Parks of Wales show some similarities one to another in employment and are distinctly different to Wales as a whole. The importance of activities which make intensive use of the environment (agriculture and fishing) and of those dependent on the quality of the environment (tourism, as indicated by Hotels, Bars and Restaurants and Recreation, Culture and Welfare) is clear. Some stronger relationship with the environment may be expected in the retail sector; many retail outlets in the NP areas are likely to be related to the tourism business are the largest employers. Public administration features in the ten largest employers in two of the three National Parks; Brecon Beacons and Snowdonia, it is ranked 11<sup>th</sup> in Pembrokeshire Coast National Park.

### ***Employment in the NPs***

**Summary Point 1.** *Ranking of industries according to the proportion of total employment illustrates the importance to the economy of the National Parks of those industries with links to the environment. Sectors which use the environment, such as agriculture, and sectors which rely on the quality of the environment are proportionately the largest employers in the NPs*

**Summary Point 2.** *Employment in the National Parks differs from Wales as a whole. Whereas environmentally linked employments are important in the NPs retail and public service (education and health) are the largest employers in Wales.*

**Summary Point 3.** *Some indication of the different character of the economy of the National Parks is indicated by the types of employment in each. Pembrokeshire Coast and Snowdonia are more strongly oriented towards tourism, Brecon Beacons appears to be more agricultural.*

## **5.1 Estimated multiplier relationships**

Income and employment multipliers are described since the objective of this study is to demonstrate the value to the Wales economy of environmental activity in its National Parks, in terms of their contribution to overall Gross Value Added and the extent of employment creation.. These multipliers are derived from the relationship between: the level of overall output indirectly dependent on environmental activities, and the incomes generated and the associated amount of employment. Thus it is possible to estimate the amount of extra income created both within and outside the National Parks' areas for each unit of income generated by environmental activity, and similarly the additional number of jobs created for each person employed. Multipliers for each of the 42 sectors described in the model are provided in the Appendix tables. In the text only those which are the primary creation of environmental value are described plus the most important sectors (in terms of the strength of effect) in each National Park.

In terms of the overall strength of income effect (£thousands per £million of gross output), education features most strongly in all National Parks, and also in the Wales economy overall. In the Brecon Beacons National Park, the motor trade generates the next highest effects, followed by travel industries and recreation. In the Pembrokeshire Coast National Park, the next highest effects are in the synthetic products area (reflecting the pivotal position of oil refining activity) followed by metal manufacturing. In the Snowdonia National Park, postal services, transport and the hotel trade are successively the next most important activities. The average strength of intra-regional income effects (indicating the degree of internal integration) is greatest in the Brecon Beacons and least in Snowdonia. The average strength of inter-regional income effects (indicating the level of income creation in the rest of Wales from activity within the National Park) is greatest in the Pembrokeshire Coast, and again least in Snowdonia.

The overall strength of the employment effect (jobs per £million of gross output) does not vary by rank (although it does by magnitude) across the National Parks. Retailing generates the highest effect, followed by the hotel and catering sector, then education, and then recreation. The average strength of intra-regional employment effects is greatest in the Brecon Beacons and roughly equal in the Pembrokeshire Coast and in Snowdonia. As with income, the average strength of inter-regional employment effects is greatest in the Pembrokeshire Coast and least in Snowdonia. However, intra-regional employment linkages are weaker than they are inter-regionally.

The specific sectors of interest for the economic contribution of the National Parks' environment to the overall economy of Wales are agriculture, forestry, the travel and tourism industries, research, public administration, recreation, culture and welfare and other community services. Some of these activities have been aggregated so that the multiplier effect applies to a broader range of activities, but the overall impact of this is small. Table 2 shows the income effect of these activities for each National Park, and Table 3 shows the employment effect. Both tables show, from left to right, the direct effect, the indirect effect occurring within the park, the indirect effect occurring outside of the park, the total effect and, finally, the multiplier coefficient. In turn these are:

**Direct effect** the actual number of employees or value of incomes earned in the named sector within the park

**Indirect effects** are the 'knock-on' employments and incomes generated by direct economic activity. These may be, for example, the creation of employment of mechanics to repair farm machinery. The total indirect effect includes both within and outside (or 'rest of Wales') of the NPs. The two provide an indication of the location of support services to economic activities in the NPs.

**Total Effects** are the sum of direct and indirect effects. The total effect is the product of the multiplier coefficient on the direct employment or income.

**Multiplier coefficients** are the ratios of direct and indirect effects estimated by the input-output model.

**Table 2: Income Multiplier Effects of Environmental Activities (£000 per £m gross output)**

Sector	Incomes created directly	Incomes created indirectly within NP	Incomes created indirectly in rest of Wales	Total income creation	Income Multiplier
<b>Brecon Beacons National Park</b>					
Agriculture & fishing	218.8	8.7	24.4	251.8	1.15
Forestry	264.4	2.9	21.6	288.9	1.09
Hotels, bars & restaurants	169.4	2.3	21.2	192.9	1.14
Other land transport	244.5	3.4	27.1	275.0	1.12
Sea & air transport	6.4	0.2	6.5	13.1	2.05
Travel agencies & other transport services	287.4	8.4	33.8	329.6	1.15
Research & development	294.7	2.7	5.7	303.1	1.03
Public administration	147.9	3.8	83.4	235.1	1.59
Recreation, culture & welfare	252.8	8.0	50.5	311.2	1.23
Other retail & community services	172.6	2.5	28.6	203.8	1.18
<b>Pembrokeshire Coast National Park</b>					
Agriculture & fishing	119.3	5.0	59.3	183.7	1.54
Forestry	277.7	10.5	20.7	308.9	1.11

Hotels, bars & restaurants	260.3	1.3	33.0	294.6	1.13
Other land transport	182.2	0.8	42.3	225.3	1.24
Sea & air transport	2.9	0.0	1.6	4.5	1.55
Travel agencies & other transport services	116.6	0.7	63.3	180.5	1.55
Research & development	241.7	1.6	19.6	262.9	1.09
Public administration	227.7	1.3	84.2	313.1	1.38
Recreation, culture & welfare	233.2	1.9	72.3	307.4	1.32
Other retail & community services	190.2	0.8	37.3	228.3	1.20
<b>Snowdonia National Park</b>					
Agriculture & fishing	86.1	2.2	8.4	96.7	1.12
Forestry	75.6	0.2	6.2	82.0	1.08
Hotels, bars & restaurants	173.9	1.0	2.5	177.4	1.02
Other land transport	180.6	1.5	3.5	185.6	1.03
Sea & air transport	120.0	2.1	0.5	122.6	1.02
Travel agencies & other transport services	120.9	1.1	6.1	128.1	1.06
Research & development	14.2	0.0	1.3	15.5	1.09
Public administration	90.1	0.5	12.1	102.8	1.14
Recreation, culture & welfare	160.8	1.3	7.9	169.9	1.06
Other retail & community services	158.0	0.8	3.2	162.0	1.03

From Table 2, it appears that the strongest total income effects associated with environmental activities (over 30% of gross output reflected in income increases) are exerted in the Brecon Beacons (in travel and transport services, recreation, and research); and in the Pembrokeshire Coast (in public administration, forestry and recreation). The weakest total income effects are nearly all associated with Snowdonia.

As far as internal indirect income effects are concerned, forestry in the Pembrokeshire Coast exerts the strongest effects, while other strong effects are observed in the Brecon Beacons in agriculture, travel and transport services and recreation. However, these are very small, mostly representing less than 1% of gross output being reflected in income increases.

**Table 3: Employment Multiplier Effects of Environmental Activities (jobs per £m gross output)**

Sector	Jobs created directly	Jobs created indirectly within NP	Jobs created indirectly in rest of Wales	Total job creation	Employment Multiplier
<b>Brecon Beacons National Park</b>					
Agriculture & fishing	10.5	1.0	1.8	13.3	1.26
Forestry	10.4	0.2	1.4	12.0	1.15
Hotels, bars & restaurants	36.1	0.3	1.9	38.3	1.06
Other land transport	19.0	0.3	2.2	21.5	1.13
Sea & air transport	14.2	0.0	0.6	14.8	1.04
Travel agencies & other transport services	10.4	0.6	2.6	13.6	1.30
Research & development	20.2	0.3	0.6	21.1	1.04
Public administration	17.1	0.4	5.4	22.9	1.34
Recreation, culture & welfare	25.5	0.9	4.6	31.0	1.21
Other retail & community services	16.0	0.3	2.4	18.6	1.17
<b>Pembrokeshire Coast National Park</b>					
Agriculture & fishing	10.5	0.5	4.4	15.4	1.46
Forestry	10.4	0.7	1.3	12.4	1.20

Hotels, bars & restaurants	36.1	0.2	3.0	39.2	1.09
Other land transport	19.0	0.1	3.4	22.5	1.18
Sea & air transport	14.2	0.0	0.1	14.3	1.01
Travel agencies & other transport services	10.4	0.1	4.8	15.3	1.46
Research & development	20.2	0.2	1.9	22.3	1.10
Public administration	17.1	0.1	5.5	22.7	1.33
Recreation, culture & welfare	25.5	0.2	6.5	32.3	1.26
Other retail & community services	16.0	0.1	3.1	19.2	1.20
<b>Snowdonia National Park</b>					
Agriculture & fishing	10.5	0.4	0.7	11.6	1.10
Forestry	10.4	0.0	0.4	10.8	1.04
Hotels, bars & restaurants	36.1	0.2	0.2	36.5	1.01
Other land transport	19.0	0.2	0.3	19.5	1.02
Sea & air transport	14.2	0.3	0.0	14.5	1.02
Travel agencies & other transport services	10.4	0.1	0.5	11.0	1.06
Research & development	20.2	0.0	0.1	20.3	1.01
Public administration	17.1	0.1	0.8	18.0	1.05
Recreation, culture & welfare	25.5	0.2	0.7	26.5	1.04
Other retail & community services	16.0	0.1	0.3	16.4	1.03

The inter-regional indirect income effects are, at their strongest, considerably greater, with public administration and recreation in both the Brecon Beacons and the Pembrokeshire Coast, recreation in the former and travel and transport services in the latter all contributing more than 5% of gross output to incomes in the rest of the Wales economy. Note that the largest multiplier ratios often reflect a small direct effect rather than a strong indirect effect (for example, that of 2.05 for sea and air transport in the Brecon Beacons relates one of the lowest direct effects to also one of the lowest total effects).

The details set out in Table 3 reveal some differences in the strength of employment effects. In contrast to the income effects, the strongest of all total effects in employment terms are exerted by the hotel and catering sector, within each National Park. All are around 40 jobs in total per £million of gross output. Recreation activities are the next strongest. The weakest are all, again, in Snowdonia, where agriculture, travel and transport services and forestry generate only around 10 jobs overall per £million of gross output.

The indirect generation of jobs within the national parks vary from 1 per £million of gross output in agriculture in the Brecon Beacons down to negligible numbers in research and forestry (Snowdonia) and sea and air transport (Pembrokeshire and Snowdonia). Outside of the National Parks, employment linkages are stronger. Five or more jobs in the rest of the Welsh economy per £million of environmental gross output in the National Parks are indirectly created in recreation and travel and transport services (Pembrokeshire Coast), and also in public administration (Pembrokeshire Coast and Brecon Beacons). The weakest external generator of employment, with negligible numbers, are research (Snowdonia) and sea and air transport (Pembrokeshire Coast and Snowdonia).

### ***Multiplier relationships in the NPs***

**Summary Point 4.** *Despite the environmentally linked sectors being the largest employers in the NP, larger income effects are noted for the non-environmental sectors.*

**Summary Point 5.** *The average strength of intra-regional income effects (indicating the degree of internal integration) is greatest in the Brecon Beacons and least in Snowdonia.*

**Summary Point 6.** *The average strength of inter-regional income effects (indicating the level of income creation in the rest of Wales from activity within the National Park) is greatest in the Pembrokeshire Coast, and again least in Snowdonia.*

**Summary Point 7.** *The strongest total income effects associated with environmental activities (over 30% of gross output reflected in income increases) are exerted in the Brecon Beacons (in travel and transport services, recreation, and research); and in the Pembrokeshire Coast (in public administration, forestry and recreation).*

**Summary Point 8.** *The weakest total income effects are nearly all associated with Snowdonia.*

**Summary Point 9.** *Internal indirect income effects are very small, mostly representing less than 1% of gross output*

**Summary Point 10.** *In contrast to the income effects, the strongest of all total effects in employment terms are exerted by the hotel and catering sector, within each National Park.*

**Summary Point 11.** *The weakest employment effects are all, again, in Snowdonia.*

## **5.2 Value of the Environment**

The multiplier relationships derived in this study are mostly smaller than those within the Wales economy as a whole, although a few are significantly larger. The fact that they vary quite considerably between National Parks demonstrates that, in order to calculate an accurate estimate of the overall value of their environmental activities to the Wales economy, estimating models for each Park has been worthwhile. In the simplest terms each Park does not contribute an equal proportion to the total. It has also provided some interesting detail on the different economic structures of the Parks and insights into the degree of their integration and potential sustainability by revealing the diversity and linkages (or lack thereof) of the economic activity in the Parks. These multiplier values will be applied to estimates of direct economic impact, in terms of income and employment, to conclude the calculation of the value of the National Parks' environment.

### 5.2.1 Employment

Calculation of economic impacts of the *environment* of the National Parks can not be made with the total employment figures such as those supplied by Nomis. Such figures include all employment, whether environmentally based or otherwise. There are obvious exceptions in which all employment in the sector can be assumed to be environmentally based, agriculture is a clear example. However, in other sectors it is necessary to estimate the proportion of employment that is environmentally based.

The estimated proportions are survey derived, employers in, for example, hotels and restaurants in the national parks were asked to estimate the proportion of their customers that were visitors to the park. Thus the link to tourism and therefore businesses dependant on the quality of the environment is estimated. This imposes the assumption of equal productivity in both environmental and non-environmental based activity within each sector. The proportions used in calculating employment are shown in Table 4 .

**Table 4: Proportion of employments environmentally based, by sector**

<b>Sector</b>	<b>Proportion environmental</b>
Agriculture and fishing	1
Forestry	1
Hotels, bars and restaurants	0.5
Other land transport	0.3
Sea and air transport	0.3
Travel agencies and other transport services	0.3
Research and development	0.3
Public administration	0.36
Recreation, culture and welfare	0.5
Other retail and community services	0.5

Estimates of direct and indirect employment due to the environment of the NPs are shown in Table 5. It is notable that after adjustment of the direct employment the ranking shown in Table 1 are repeated in the environmental based sectors in each of the NPs. In Brecon, for example, agriculture, recreation and hotels bars and restaurants are the three largest direct employers.

**Table 5: Economic Impact of the Environment of National Parks: Employment by sector**

<b>Brecon Beacons</b>						
	Direct employment	Indirect employment in Park	Indirect employment outside	Total	% Indirect in	% Indirect out
Agriculture and fishing	1,284	119	215	1,618	36	64
Forestry	8	0	1	9	13	88
Hotels, bars and restaurants	475	4	25	503	14	86
Other land transport	57	1	6	64	12	88
Sea and air transport	1	0	0	1	0	100
Travel agencies and other transport services	44	2	11	57	19	81
Research and development	15	0	0	16	33	67
Public administration	160	4	51	215	7	93
Recreation, culture and welfare	635	22	111	768	16	84
Other retail and community services	40	1	6	47	11	89
<b>Total: Brecon Beacons</b>	<b>2,718</b>	<b>153</b>	<b>426</b>	<b>3,297</b>	<b>26</b>	<b>74</b>
<b>Pembrokeshire Coast NP</b>						
Agriculture and fishing	917	43	379	1,339	10	90
Forestry	3	0 <sup>2</sup>	0	4	35	65
Hotels, bars and restaurants	1,480	8	125	1,613	6	94
Other land transport	172	1	30	203	3	97
Sea and air transport	83	0	1	84	0	100
Travel agencies and other transport services	59	1	26	85	2	98
Research and development	1	0	0	1	10	90
Public administration	139	1	45	184	2	98
Recreation, culture and welfare	825	6	208	1,040	3	97
Other retail and community services	84	1	16	101	3	97
<b>Total: Pembrokeshire Coast</b>	<b>3,762</b>	<b>61</b>	<b>831</b>	<b>4,654</b>	<b>7</b>	<b>93</b>
<b>Snowdonia</b>						
Agriculture and fishing	1,414	51	90	1,555	36	64
Forestry	96	0	4	100	0	100
Hotels, bars and restaurants	1,174	6	6	1,186	50	50
Other land transport	64	1	1	65	40	60
Sea and air transport	0	0	0	0	100	0
Travel agencies and other transport services	17	0	1	18	17	83
Research and development	46	0	0	46	0	100
Public administration	254	1	11	266	11	89
Recreation, culture and welfare	662	6	21	688	22	78
Other retail and community services	48	0	1	49	25	75
<b>Total: Snowdonia</b>	<b>3,775</b>	<b>66</b>	<b>135</b>	<b>3,976</b>	<b>33</b>	<b>67</b>
<b>Total: All National Parks of Wales</b>	<b>10,255</b>	<b>280</b>	<b>1,392</b>	<b>11,926</b>	<b>17</b>	<b>83</b>

<sup>2</sup> Note that rounding of estimates results in values less than 0.5 being shown as 0, proportions inside & outside the park refer to actual (not rounded) estimate.

### ***Employment Characteristics of the NPS***

**Summary Point 12.** *The relative dominance, in terms of direct employment of three sectors: agriculture, recreation and hotels is seen in all of three of the National Parks*

**Summary Point 13.** *Indirect employment within the National Parks is consistently the smaller proportion of indirect effect, though this varies widely across sectors*

**Summary Point 14.** *Pembrokeshire Coast and Snowdonia NPs have similar rates of direct employment, almost 3,800 direct jobs in each. Direct employment in Brecon Beacons is considerably less, only slightly more than 2,700 jobs.*

**Summary Point 15.** *The lower direct employment in the Brecon Beacons is due largely to low employment in the Hotels bars and restaurants sector.*

**Summary Point 16.** *Snowdonia has the largest proportion (33%) of indirect employment retained within the NP. More than one quarter (26%) of the indirect employment effects are retained with the Brecon Beacons NP. The Pembrokeshire Coast NP differs greatly in the retention of indirect employment, only 6% is retained.*

**Summary Point 17.** *Total direct employment relating to the environment of the national parks of Wales amounts to 10,255 jobs.*

**Summary Point 18.** *Indirect employment for the three National Parks is 1,671*

**Summary Point 19.** *17% of indirect employment is within the National Parks, more than four fifths (83%) of indirect employment occurs outside of the National Parks.*

Several further issues are worthy of note:

Bilsborough and Hill (2002) estimated 117,000 jobs in Wales in activities relating to the environment. This is around 17% of the total employment in Wales of 964,000 full time equivalents. The 11,926 jobs linked to the environment in NPs amounts to 1.24% of total employment in Wales and 10.19% of all Welsh employment linked to the environment.

While ‘environment’ may be a constant factor across the economic activity of the three NPs they are each distinct in their relationship to the environment, in particular the proportion of activity which is in the three VoE Categories of environmental use:

- Activities that make intensive use of one or more elements of the environment as a primary resource
- Activities which are dependant on the quality of the environment
- Activities concerned with the protection and enhancement of the environment

Some indication of this is shown in Table 6.

Brecon Beacons NP has the highest proportion of ‘Users’ of the environment of all NPs (49%) and the lowest proportion of sectors dependant on the quality (43%). It is the park which has the lowest rate of direct employment and lowest direct incomes. It has less displacement/retains more of indirect effect than Pembrokeshire Coast but has more displacement /retains less of the indirect effects than Snowdonia. Physically it has more in common with Snowdonia than Pembrokeshire; it is similarly proportioned in terms of area to perimeter ratio and hence subject to similar restraints. Snowdonia NP has a slightly greater emphasis on sectors dependant on the quality of the environment, while the difference is proportionately small, the differences in total employment result in absolute direct employment rates which are very similar (1627 in Brecon and 1655 in Snowdonia). However this is largely due to the higher multipliers of Brecon; more than twice the indirect jobs are generated than Snowdonia despite direct employment considerably less in Brecon.

**Table 6: Employment by relationship to environment (Number of jobs)**

<b>Brecon Beacons</b>					
<b>Relationship to environment<sup>3</sup></b>	<b>Direct employment</b>	<b>Indirect in NP</b>	<b>Indirect outside NP</b>	<b>Total Employment</b>	<b>% of total</b>
User	1,292	119	216	1,627	49.3
Dependant on quality	1252	30	159	1,441	43.7
Protector	175	4	51	230	7.0
<b>Total Brecon</b>	<b>2718</b>	<b>153</b>	<b>426</b>	<b>3297</b>	<b>100</b>
<b>Pembrokeshire Coast NP</b>					
User	920	43	379	1342	28.8
Dependant on quality	2,703	17	406	3126	67.2
Protector	140	1	45	186	4.0
<b>Total PCNP</b>	<b>3762</b>	<b>61</b>	<b>831</b>	<b>4654</b>	<b>100</b>
<b>Snowdonia</b>					
User	1,510	51	94	1655	38.3
Dependant on quality	1,965	13	30	2351	54.4
Protector	300	1	11	313	7.2
<b>Total Snow</b>	<b>3775</b>	<b>66</b>	<b>135</b>	<b>3976</b>	<b>100</b>

Pembrokeshire Coast has by far the greatest proportion of businesses dependant on the quality of the environment (67%). Its physical layout contrasts with the other two parks suggesting a greater degree of porosity. This is supported by the coastal park having the lowest retention/highest displacement of both of the indirect measures; indirect employment within the park of only 7% and indirect incomes within the park of only 5%.

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<sup>3</sup> Users of the environment are Agriculture and Fishing, and Forestry; Tourism, as indicated by the sectors which provide goods and services to the tourism industry are those that are Dependant on Quality; Protectors of the Environment are largely the administrative organisations charged with protecting and enhancing the environment and natural resource.

***Employment characteristics of the NPs***

***Summary Point 20.*** Brecon Beacons has the lowest direct employment of the NPs

***Summary Point 21.*** Brecon Beacons is the only Park in which the greater proportion of environmentally linked employment is users of the environment

***Summary Point 22.*** PCNP has the lowest proportion of employment in users and the largest proportion of employment in dependant on the environment

***Summary Point 23.*** PCNP has the largest indirect employment effect outside the Park and the smallest indirect effect inside the Park

***Summary Point 24.*** Brecon has the largest indirect employment inside the within its boundaries

***Summary Point 25.*** Despite being the largest direct employer, the indirect employment effects of Snowdonia are small

## 5.2.2 Income

Directs incomes relating to environmental employments are considerable; ranging from around £40million in Brecon to over £50millions in both Pembrokeshire Coast and Snowdonia.

Again, Pembrokeshire Coast retains the lowest proportion of indirect effect within its borders; only 5% of the indirect incomes are retained within the park. In contrast both Brecon and Snowdonia retain 15% of indirect incomes within the parks. In fiscal terms these differences are considerable; indirect incomes in Pembrokeshire Coast NP amount to only £773,969, compared to over £16millions outside the park. The total indirect effect of the Pembrokeshire Coast NP is relatively large. Direct Incomes in Snowdonia, for example are greater (£55millions compared to £51 millions), yet the indirect effect of Pembrokeshire Coast is 3.7 times that of Snowdonia (£4.61m compared to £16.97m).

Income and employment multiplier coefficients are generally lower in Snowdonia than in the other NPs. The effects of this are clearly evident in a comparison with the indirect effect in the Brecon Beacons NP. Despite the lowest direct incomes of all the NPs indirect incomes of £8.48millions are generated in the Brecon Beacons; this indirect effect is almost twice that of Snowdonia which has the largest direct incomes of all the Parks.

**Table 7: Economic Impact of the Environment of National Parks: Incomes by sector**

<b>Brecon Beacons (£)</b>						
	Direct incomes	Indirect incomes in NP	Indirect incomes outside NP	Total	% Indirect in park	% Indirect outside
Agriculture and fishing	18,203,268	717,682	2,012,808	20,933,758	26	74
Forestry	318,864	3,397	25,301	347,562	12	88
Hotels, bars and	4,493,041	61,564	567,461	5,122,066	10	90

restaurants						
Other land transport	1,130,938	15,129	120,584	1,266,651	11	89
Sea and air transport	14,653	459	14,926	30,038	3	97
Travel agencies and other transport services	1,176,588	35,130	141,358	1,353,076	20	80
Research and development	307,331	2,964	6,256	316,551	32	68
Public administration	4,077,731	104,843	2,301,019	6,483,592	4	96
Recreation, culture and welfare	9,429,305	296,580	1,872,160	11,598,045	14	86
Other retail and community services	1,016,800	14,713	168,311	1,199,824	8	92
<b>Total: Brecon</b>	<b>40,168,518</b>	<b>1,252,460</b>	<b>7,230,186</b>	<b>48,651,163</b>	<b>15</b>	<b>85</b>
<b>Pembrokeshire Coast</b>						
Agriculture and fishing	13,000,309	545,892	6,474,275	20,020,476	8	92
Forestry	119,574	4,427	8,727	132,727	34	66
Hotels, bars and restaurants	14,009,386	69,026	1,752,194	15,830,606	4	96
Other land transport	3,434,701	15,301	809,028	4,259,029	2	98
Sea and air transport	1,348,067	0	741,437	2,089,504	0	100
Travel agencies and other transport services	1,560,780	9,389	849,040	2,419,209	1	99
Research and development	18,078	123 <sup>4</sup>	1,504	19,705	8	92
Public administration	3,527,924	20,384	1,320,228	4,868,536	2	98
Recreation, culture and welfare	12,260,325	100,462	3,822,842	16,183,629	3	97
Other retail and community services	2,135,280	8,967	418,089	2,562,336	2	98
<b>Total : PCNP</b>	<b>51,414,424</b>	<b>773,969</b>	<b>16,197,363</b>	<b>68,385,757</b>	<b>5</b>	<b>95</b>
<b>Snowdonia</b>						
Agriculture and fishing	20,046,278	499,266	1,906,288	22,451,831	21	79
Forestry	3,826,368	9,566	296,544	4,132,477	3	97
Hotels, bars and restaurants	11,116,606	63,523	158,809	11,338,938	29	71
Other land transport	1,280,533	11,525	26,891	1,318,949	30	70
Sea and air transport	4,884	79	19	4,982	81	19
Travel agencies and other transport services	464,232	4,255	23,598	492,086	15	85
Research and development	915,967	0	82,437	998,404	0	100
Public administration	6,460,225	35,890	868,541	7,364,657	4	96
Recreation, culture and welfare	9,830,552	83,346	506,487	10,420,385	14	86
Other retail and community services	1,220,160	7,321	29,284	1,256,765	20	80
<b>Total : Snowdonia</b>	<b>55,165,805</b>	<b>714,771</b>	<b>3,898,898</b>	<b>59,779,474</b>	<b>15</b>	<b>85</b>
<b>Total: All National Parks of Wales</b>	<b>146,748,748</b>	<b>2,741,200</b>	<b>27,326,446</b>	<b>176,816,314</b>	<b>9</b>	<b>91</b>

<sup>4</sup> Due to rounding of the employment estimates some sectors may be shown as zero, where this occurs the income shown is the actual (not rounded) employment figure x the average income in sector.

Together the three NPs of Wales generate considerable income: direct income is £146.75millions, a further £30.07 millions of indirect income is generated - £2.74millions within the parks and £27.33millions to the rest of the Welsh economy. Only 9% of the indirect incomes are retained within the NPs, 91% of indirect incomes are made outside of the NPs.

It appears that the value of the environment, in terms employment and income is considerable, almost £150millions in direct incomes, and rising to £176millions with the addition of indirect incomes. However there is considerable disparity among the three national parks as to the how and where these benefits are made.

Table 8 shows the incomes allocated to the environmental relationship classes. In outline the emphasis of each park is maintained; Pembrokeshire Coast is strongly tourism based while Brecon and Snowdon show some similarity in proportion. However there are some notable issues. Firstly in all the National Parks the 'users' and those dependant on quality take proportionately less income than their share of employment would suggest. For example, in Brecon almost 50% of environmental employment is in agriculture and forestry, only 44% of incomes are allocated to this group. This is repeated in all the NPs and is most acute in the sector dependant on quality of the environment in Snowdonia; over 54% of employees generate 42% of incomes. This is offset by employment in activities concerned with the protection and enhancement of the environment; in all of the National Parks the proportion of employment to income is around 1:2. In Brecon 7% of employment generates 14% of income; in Pembroke the figures are 4% and 7%, and in Snowdon 7% and 14%. The disparity in total employment and income figures are indicative of the lower incomes often associated with both agriculture and hospitality (see Section Appendix I Average Income per Employee by Sector). Agricultural earnings at an average of a little over £14,000 per annum compare poorly with the £25,454 in public administration. The difference in hotels bars and restaurants is even greater; average income in the hospitality sector is under £10,000 per annum.

**Table 8: Incomes by relationship to environment (£)**

<b>Brecon Beacons</b>					
<b>Relationship to environment</b>	Direct incomes	Indirect in NP	Indirect outside NP	Total	% of total
User	18,522,132	721,079	2,038,109	21,281,320	44
Dependant on quality	17,261,325	423,575	2,884,800	20,569,700	42
Protector	4,385,062	107,807	2,307,275	6,800,144	14
<b>Total BBNP</b>	<b>40,168,519</b>	<b>1,252,461</b>	<b>7,230,184</b>	<b>48,651,164</b>	<b>100</b>
<b>Pembrokeshire Coast NP</b>					
User	13,119,883	550,319	6,483,002	20,153,204	29
Dependant on quality	34,748,539	203,145	8,392,630	43,344,314	63
Protector	3,546,002	20,507	1,321,732	4,888,241	7
<b>Total PCNP</b>	<b>51,414,424</b>	<b>773,971</b>	<b>16,197,364</b>	<b>68,385,759</b>	<b>100</b>
<b>Snowdonia</b>					
User	23,872,646	508,832	2,202,832	26,584,310	44
Dependant on quality	23,916,967	170,049	745,088	24,832,104	42
Protector	7,376,192	35,890	950,978	8,363,060	14
<b>Total SNP</b>	<b>55,165,805</b>	<b>714,771</b>	<b>3,898,898</b>	<b>59,779,474</b>	<b>100</b>

### ***Incomes Generated by the NPs***

**Summary Point 26.** *Direct incomes of environmentally linked work in the National Parks amount to £146.75m; indirect incomes amount to £30.1m to give a total of £176.8m.*

**Summary Point 27.** *Brecon Beacons has the lowest direct income at £40m; Pembrokeshire Coast has £51.4 and the largest, Snowdonia at £55.2m*

**Summary Point 28.** *Together the Parks create over £30m of indirect income*

**Summary Point 29.** *Snowdonia has the lowest indirect incomes (£4.6m), Pembrokeshire coast the largest at almost £17m; Brecon has the lowest direct income but generates £8.5m of indirect income*

**Summary Point 30.** *on average 91% of indirect incomes are made outside of the NPs*

**Summary Point 31.** *85% of the indirect incomes from Snowdon and Brecon Beacons are made outside the parks, this rises to 95% for Pembrokeshire Coast.*

**Summary Point 32.** *Pembrokeshire Coast generates the greatest proportion of incomes from activities dependant on the quality of the environment (63%).*

**Summary Point 33.** *Snowdon and Brecon obtain similar proportions from the various environmentally linked activities although the absolute amounts are considerably larger in Snowdonia.*

**Summary Point 34.** *Generally poor wages in the sectors 'users' and 'dependent on environmental quality' are reflected in their contribution to total incomes; invariably the contribution to total income is less than the proportion of total employment*

**Summary Point 35.** *The ratio of employment to income of Protectors of the environment is approximately 1:2*

### **5.2.3 GDP**

Gross Domestic Product of the sectors in each Park are shown below (Table 9). For the purpose of comparison to previous VoE reports, GDP rather than Gross Value Added (GVA is the measure preferred by the Welsh Assembly in recent times) and is calculated using estimates from 2000.

Bilsborough & Hill (2002) estimated the GDP of environmentally linked economic activity at £1,643m, £724m and £2,367m for direct, indirect and total effects respectively. The suite of NPs in Wales generates GDP of £177m direct, £28m indirect and £204m total. These figures amount to 11%, 4% and 9% of the national estimates of the original VoE study.

The effect of the low multipliers in the NPs is also in evidence; nationally 31% of the total GDP was through indirect effects, within the NPs this falls to 14%.

The three parks show considerable variation in the proportion of GDP generated as indirect effects, Pembrokeshire Coast NP is the largest at 19%, Brecon is slightly lower at 17% and Snowdonia is the lowest at only 4%.

**Table 9: GDP by National Park and sector (£)**

	<b>Brecon Beacons</b>			
	direct employment	indirect in NP	indirect outside NP	total
Agriculture and fishing	13,042,313	1,216,086	2,188,955	16,447,355
Forestry	81,261	1,530	10,710	93,500
Hotels, bars and restaurants	5,276,591	48,779	308,933	5,634,302
Other land transport	630,522	11,114	81,499	723,135
Sea and air transport	10,008	0	452	10,461
Travel agencies and other transport services	490,406	31,168	135,061	656,634
Research and development	389,951	4,615	9,231	403,798
Public administration	4,083,021	84,987	1,147,321	5,315,329
Recreation, culture and welfare	24,257,277	739,945	3,781,944	28,779,166
Other retail and community services	437,333	9,084	72,671	519,088
<b>Total: Brecon Beacons</b>	<b>48,698,683</b>	<b>2,147,308</b>	<b>7,736,776</b>	<b>58,582,767</b>
	<b>Pembrokeshire Coast NP</b>			
Agriculture and fishing	9,314,487	439,021	3,863,383	13,616,891
Forestry	30,473	2,142	3,978	36,592
Hotels, bars and restaurants	16,452,510	104,564	1,568,463	18,125,536
Other land transport	1,914,919	11,127	378,322	2,304,368
Sea and air transport	920,762	0	10,403	931,166
Travel agencies and other transport services	650,539	6,900	331,211	988,649
Research and development	22,938	194	1,842	24,975
Public administration	3,532,502	18,479	1,016,318	4,567,298
Recreation, culture and welfare	31,540,194	217,296	7,062,116	38,819,606
Other retail and community services	918,400	6,312	195,670	1,120,382
<b>Total: Pembrokeshire Coast</b>	<b>65,297,723</b>	<b>806,035</b>	<b>14,431,706</b>	<b>80,535,464</b>
	<b>Snowdonia</b>			
Agriculture and fishing	14,362,796	524,446	917,780	15,805,023
Forestry	975,126	0	39,167	1,014,293
Hotels, bars and restaurants	13,055,253	73,754	73,754	13,202,760
Other land transport	713,924	6,453	9,680	730,057
Sea and air transport	3,336	75	0	3,411
Travel agencies and other transport services	193,494	2,186	10,931	206,611
Research and development	1,162,208	0	10,317	1,172,525
Public administration	6,468,607	31,900	255,204	6,755,711
Recreation, culture and welfare	25,289,501	199,548	698,416	26,187,465
Other retail and community services	524,800	4,328	12,985	542,113
<b>Total: Snowdonia</b>	<b>62,749,046</b>	<b>842,691</b>	<b>2,028,233</b>	<b>65,619,969</b>
<b>Total: All National Parks of Wales</b>	<b>176,745,452</b>	<b>3,796,033</b>	<b>24,196,715</b>	<b>204,738,200</b>

The proportion of GDP generated by each sector linked to the environment is shown below (Table 10). Recreation Culture and Welfare is the strongest contributor in all Parks followed by Agriculture and Fishing then Hotels Bars and Restaurants then Public Administration. All other sectors, with the exception of Other Land Transport in Pembrokeshire, contribute less than 2% each.

**Table 10: Contribution of Sectors to total GDP of National Park (%)**

	<b>Brecon Beacons</b>	<b>Pembrokeshire Coast</b>	<b>Snowdonia</b>	<b>Average of 3 NPs</b>
Agriculture and fishing	28.08	16.91	24.09	23.02
Forestry	0.16	0.05	1.55	0.58
Hotels, bars and restaurants	9.62	22.51	20.12	17.41
Other land transport	1.23	2.86	1.11	1.74
Sea and air transport	0.02	1.16	0.01	0.39
Travel agencies and other transport services	1.12	1.23	0.31	0.89
Research and development	0.69	0.03	1.79	0.84
Public administration	9.07	5.67	10.30	8.35
Recreation, culture and welfare	49.13	48.20	39.91	45.75
Other retail and community services	0.89	1.39	0.83	1.03

Some indication of the shape of the economy of each Park is illustrated in the figures:

- In Brecon Agriculture, Travel Agencies & Other Transport Services, Public Administration and Recreation Culture and Welfare are *above* the NP average, all other sectors are below average
- In Pembrokeshire Agriculture, Forestry Research and Development and Public Administration are *below* the NP average, all other sectors are above the average. Hotels Bars and Restaurants and both transport sectors are particularly large.
- In Snowdonia both Agriculture and Hotels Bars and Restaurants are *above* average. It is the only park in which the contribution of Recreation Culture and Welfare is less than the NP average.

The contribution by type of link to the environment in each of the NPs is shown in Table 11.

**Table 11: Contribution by environmental link to total GDP of National Park (%)**

<b>Relationship to environment</b>	<b>Brecon Beacons</b>	<b>Pembrokeshire Coast</b>	<b>Snowdonia</b>	<b>Average of 3 NPs</b>
User	28.24	16.95	25.63	23.61
Dependent on quality	62.00	77.34	62.29	67.21
Protector	9.76	5.70	12.08	9.18

Again the similarity of Brecon, in terms of proportions if not absolute amounts, is clear. In both Parks the activities Dependent on Quality contribute over 60% of GDP;

a somewhat larger contribution of agriculture in the Brecon Beacons (28% compared to 26%) is offset by a lower contribution by Protectors (10% compared to 12%).

Pembrokeshire Coast stands as a contrast to the previous pair, Users make a significantly smaller contribution (17% compared to 26% and 28%) while those Dependent on Quality make a significantly larger contribution (77% compared to 62% in Brecon and Snowdonia) Protectors of the Environment make a proportionally smaller contribution than average in Pembrokeshire.

<b>GDP of the NPs</b>	
<b>Summary Point 36.</b>	<i>Total GDP of the NPs is £204m (£177 direct and £28m indirect); this amounts to 9% (11% direct and 4% indirect) of the original VoE National Estimates</i>
<b>Summary Point 37.</b>	<i>Indirect effects of the NPs generate a relatively small proportion of total GDP, on average 14% compared to 31% in the National Study</i>
<b>Summary Point 38.</b>	<i>Pembrokeshire Coast has the largest indirect contribution to total GDP (19%) followed by Brecon (17%) and Snowdonia (4%).</i>
<b>Summary Point 39.</b>	<i>Recreation Culture and Welfare generates almost half of the GDP of Brecon Beacons and Pembrokeshire Coast but almost 10% less in Snowdonia at 39.9%</i>
<b>Summary Point 40.</b>	<i>Brecon Beacons has the largest contribution from Agriculture, Pembrokeshire Coast the lowest</i>
<b>Summary Point 41.</b>	<i>Brecon Beacons has the lowest contribution from Hotels Bars and Restaurants, Pembrokeshire Coast the largest</i>
<b>Summary Point 42.</b>	<i>In terms of proportional contribution to GDP by environmental linked activity Brecon Beacons and Snowdonia are similar around one quarter by users, almost two thirds by dependent on quality and one tenth by protectors in each Park.</i>
<b>Summary Point 43.</b>	<i>In Pembrokeshire Coast more than three quarters of GDP is generated by those dependent on quality of the environment</i>

### 5.2.4 Indicative Trade Flows

Results of a survey of businesses in the NPs are shown in Table 12. Across the three NPs of Wales around 65% of people employed in the National Park live there, slightly more than half of the customers are visitors to the National Parks and a similar proportion of suppliers are located outside the National Parks.

**Table 12: Indicative trade flows of businesses in National Parks (%)**

Location	employees		customers		suppliers	
	in park	outside	in park	outside	in park	outside
Brecon Beacons	82.41	17.59	42.50	57.50	56.67	43.33

Pembrokeshire Coast	41.43	58.57	18.67	81.33	33.67	66.33
Snowdonia	70.83	29.17	43.33	56.67	52.67	47.33
All NPs	64.89	35.11	47.00	53.00	47.67	52.33

Table 12 shows that while there are similarities between the Brecon Beacons and Snowdonia, this pair is significantly different to PCNP.

- Businesses in both Snowdonia and Brecon source slightly more than half of their supplies from within the park
- Businesses in both Snowdonia and Brecon serve more visitors than people who live in the park
- Businesses in both Snowdonia and Brecon employ largely people who live in the park.
- All of these are reversed in Pembrokeshire Coast, more employees are from outside of the Park, more than four fifths of the customers are from outside the Park and around two thirds of suppliers are outside of the Park.

**Summary Point 44.** *Businesses in Brecon Beacons and Snowdonia show great similarity in proportions of customers and suppliers within and outside of the Park.*

**Summary Point 45.** *Businesses in Brecon have the largest proportion of employees from within the Park (82%), Pembrokeshire Coast the lowest (41%)*

**Summary Point 46.** *Businesses in Brecon have the largest proportion of suppliers from within the Park (57%), Pembrokeshire Coast the lowest (34%)*

## 6 The National Parks of Wales

The National Parks of Wales each individually present some part of the broad range of characters that make up the Welsh countryside. Together the three, though perhaps not an explicit objective, form a comprehensive suite. Between them, the parks border sparsely populated rural areas, busy coastal regions and the ex-industrial South Wales valleys. They are home to iconic Welsh landscapes and features as well as lesser known areas. The range is impressive, from the mountainous north Wales of Snowdonia through the softer hills of the Brecon Beacons to the coast of Pembrokeshire. Equally, the economy of each of the three Parks varies considerably, and the range and significance of the various economic activities in each is distinct one to another. The common feature of all is the title of National Park and the aims and objectives of that designation. On the ground, the result is the quality of environment and landscape inherent in the designation. In the following sections the economic activity relating to these high quality environments are summarised, as the suite of NPs and as individual parks.

### 6.1 The Environmental Economy of the National Parks of Wales

Total employment in the NPs is estimated to be 42,680; this is approximately 3.9% of Wales's total employment of 1.1m jobs (*Source*: Nomis). Total employment linked to the environment (direct plus indirect in the parks) is 10,535, 25% of all employment in the Parks (Table 13).

**Table 13: Employment by Sector in the three National Parks of Wales**

	<b>Direct employment</b>	<b>Indirect employment in Parks</b>	<b>Indirect employment outside</b>	<b>Total</b>	<b>% Indirect in</b>	<b>% Indirect out</b>
Agriculture and fishing	3,615	213	684	4,512	24	76
Forestry	107	0	5	113	0	100
Hotels, bars and restaurants	3,129	18	156	3,302	10	90
Other land transport	293	3	37	332	8	93
Sea and air transport	84	0	1	85	0	100
Travel agencies and other transport services	120	3	38	160	7	93
Research and development	62	0	0	63	0	0
Public administration	553	6	107	665	5	95
Recreation, culture and welfare	2,122	34	340	2,496	9	91
Other retail and community services	172	2	23	197	8	92
<b>Total</b>	<b>10255</b>	<b>280</b>	<b>1392</b>	<b>11926</b>	<b>17</b>	<b>83</b>

Direct employment in environmentally linked activities amounts to 10,255 jobs, a further 1,671 indirect jobs are generated. Indirect employment is relatively low at 16% of direct jobs, a reflection of multipliers which are somewhat lower than for the rest of Wales. It is notable that a great deal of the indirect employment of the National Parks (83%) is made outside of the designated areas.

Three sectors account for around 87% of environmentally linked employment (see Table 14) in the NPs: Agriculture (38%), Hotels Bars and Restaurants (28%), and Recreation Culture and Welfare (21%).

**Table 14: Proportion of Employment by Sector in the three National Parks of Wales (%)**

Agriculture and fishing	37.84
Forestry	0.95
Hotels, bars and restaurants	27.69
Other land transport	2.78
Sea and air transport	0.71
Travel agencies and other transport services	1.34
Research and development	0.53
Public administration	5.58
Recreation, culture and welfare	20.93
Other retail and community services	1.65

Public administration, at 5.58% is the only other large employer.

More than half (55%) of all environmentally linked employment in the NPs is in activities that are dependant on the quality of the environment, 39% are categorised as Users of the environment while 6% are protectors of the environment (Table 15).

**Table 15: Employment by link to environment in the three National Parks of Wales**

<b>Relationship to environment</b>	<b>Total</b>	<b>As % of total employment in the Parks</b>
Users	4,625	39
Dependent on quality	6,572	55
Protectors	728	6

Total income generated by the environmentally linked activity in the NPs is £177m. This equates to an average annual income for all environmental employment in the NPs of only £14,826, considerably lower than the Welsh average of around £19,853. The lower incomes which are characteristic of agricultural and hospitality sectors are illustrated in Table 16: proportion of incomes is less than the proportion of employments in the Agricultural, and Hotels Bars and Restaurants sectors.

**Table 16: Incomes by Sector in the three National Parks of Wales (£)**

<b>Sector</b>	<b>Total</b>	<b>as % of all incomes</b>
Agriculture and fishing	63,406,065.00	35.86
Forestry	4,612,766.00	2.61
Hotels, bars and restaurants	32,291,610.00	18.26
Other land transport	6,844,629.00	3.87
Sea and air transport	2,124,524.00	1.20
Travel agencies and other transport services	4,264,371.00	2.41
Research and development	1,334,660.00	0.75
Public administration	18,716,785.00	10.59
Recreation, culture and welfare	38,202,059.00	21.61
Other retail and community services	5,018,925.00	2.84
<b>Total</b>	<b>176,816,394.00</b>	<b>100.00</b>

As shown in Table 17, almost 89% of incomes in the National Parks are located in the two sectors Users and Dependant on the quality of the environment; the former is largely agriculture and the latter the sectors which make up the hospitality industry. Both industries have lower incomes than the Welsh average.

**Table 17: Incomes by link to environment in the three National Parks of Wales**

<b>Relationship to environment</b>	<b>Direct incomes</b>	<b>Indirect in NP</b>	<b>Indirect outside NP</b>	<b>Total</b>	<b>as % of all incomes</b>
User	55,514,661	1,780,230	10,723,943	68,018,831	38.47
Dependant on quality	75,926,831	796,769	12,022,518	88,746,118	50.19
Protector	15,307,256	164,204	4,579,985	20,051,445	11.34
<b>Total</b>	<b>146,748,748</b>	<b>2,741,203</b>	<b>27,326,446</b>	<b>176,816,394</b>	<b>100.00</b>

The trend of decreasing output compared to employment levels in the low paid sectors of Agriculture and Hotels, Bars and Restaurants is even greater in terms of GDP (Table 18). Agriculture, for example, contributes 38% of employment and produces 22% of the GDP and in Hotels, Bars and Restaurants 28% of employment produces 18% of GDP. Recreation Culture and Welfare, however, accounts for 21% of employment and contributes 46% to GDP.

**Table 18: GDP by Sector in the three National Parks of Wales**

	<b>GDP (£)</b>	<b>As a % of total</b>
Agriculture and fishing	45,869,269	22.40
Forestry	1,144,385	0.56
Hotels, bars and restaurants	36,962,598	18.05
Other land transport	3,757,560	1.84
Sea and air transport	945,038	0.46
Travel agencies and other transport services	1,851,894	0.90
Research and development	1,601,298	0.78
Public administration	16,638,338	8.13
Recreation, culture and welfare	93,786,237	45.81
Other retail and community services	2,181,583	1.07
<b>Total</b>	<b>204,738,200</b>	<b>100.00</b>

These employment/output disparities are carried through to the categories of environmental relationship. Users of the Environment contribute less than one quarter of GDP but employ almost 40% of those working in environmentally linked activity. The higher productivity of such sectors as Recreation Culture and Welfare no doubt contribute to the activities Dependent on Quality contributing over 68% of the GDP yet employing proportionately less (55%).

**Table 19: GDP by link to environment in the three National Parks of Wales**

<b>Relationship to environment</b>	<b>Total</b>	<b>as % of total GDP</b>
Users	47,013,654	22.96
Dependent on Quality	139,484,910	68.13
Protectors	18,239,636	8.91

## **6.2 The Environmental Economies of the Individual National Parks of Wales**

The primary influence on the economies of the individual National Parks and indeed of the suite of Parks in Wales is the rate of employment within sectors. The parks are designated for their environmental quality which, logically, supports certain sectors of economic activity. It should be no surprise then, that both the wider general economy and the environmentally linked economy of the National Parks are largely based on a relatively narrow range of economic activities linked to the environment. This 'National Park Economy' differs from the wider national economy, in terms of which sectors are the major employers, quite considerably (see, for example, Table 1).

There is some suggestion from interviews with those living and working in the parks that the economy of the Parks is the natural outcome of physical and social influences; for example the beauty of Snowdon would attract visitors and thus develop a hospitality industry with or without the designation of NP. While there is undoubtedly some truth in such assertions the designation is equally likely to be part of the attractor, as one interviewer thought the designation is "...a guarantee of quality". It is also the guarantor of enduring quality, moderating the impacts of, to continue the example, tourism in Snowdonia. As such NP status supports the sustainability of the environmentally linked economic activity.

The interaction between natural development due to the physical and social influences of the areas and the status and conditions conferred by NP designation are undoubtedly complex. The broad outcomes outcome is likely similar in either case, predominance by environmentally linked activities. As discussed in the previous section, employment in the suite of Parks in Wales is dominated by three sectors; three sectors account for around 87% of environmentally linked employment (see Table 14) in the NPs: Agriculture, Hotels Bars and Restaurants, and Recreation Culture and Welfare. Public Administration contributes a further 5.5% of employment. In each of the three Parks these Sectors continue to dominate. However, as shown in Figure 1, the proportion of employment within each sector varies across the Parks. For example Brecon has above average employment in Agriculture and below average employment in Bars, Hotels and Restaurants. Clearly incomes and GDP of the parks is linked to the sectors which dominate. Thus the parks come to reflect the sectors which dominate.

This 'sectoral dominance' is perhaps more clearly illustrated using the VoE categories of environmental linkage, as shown in Figure 2.

If employment within sectors is the major influencing factor then there is a further consideration which varies across the Parks; location of employment in relation to the Park. Indirect employment is largely outside of the Parks, around 83%, although actual numbers are small. This varies somewhat with sector, nationally Agriculture retains the greatest proportion of indirect employment within the parks, but more so across the Parks. Pembrokeshire Coast, for example generates considerably more indirect employment outside of the park, sector for sector, than the others.

Each Park is summarised using these guidelines in the following sections.

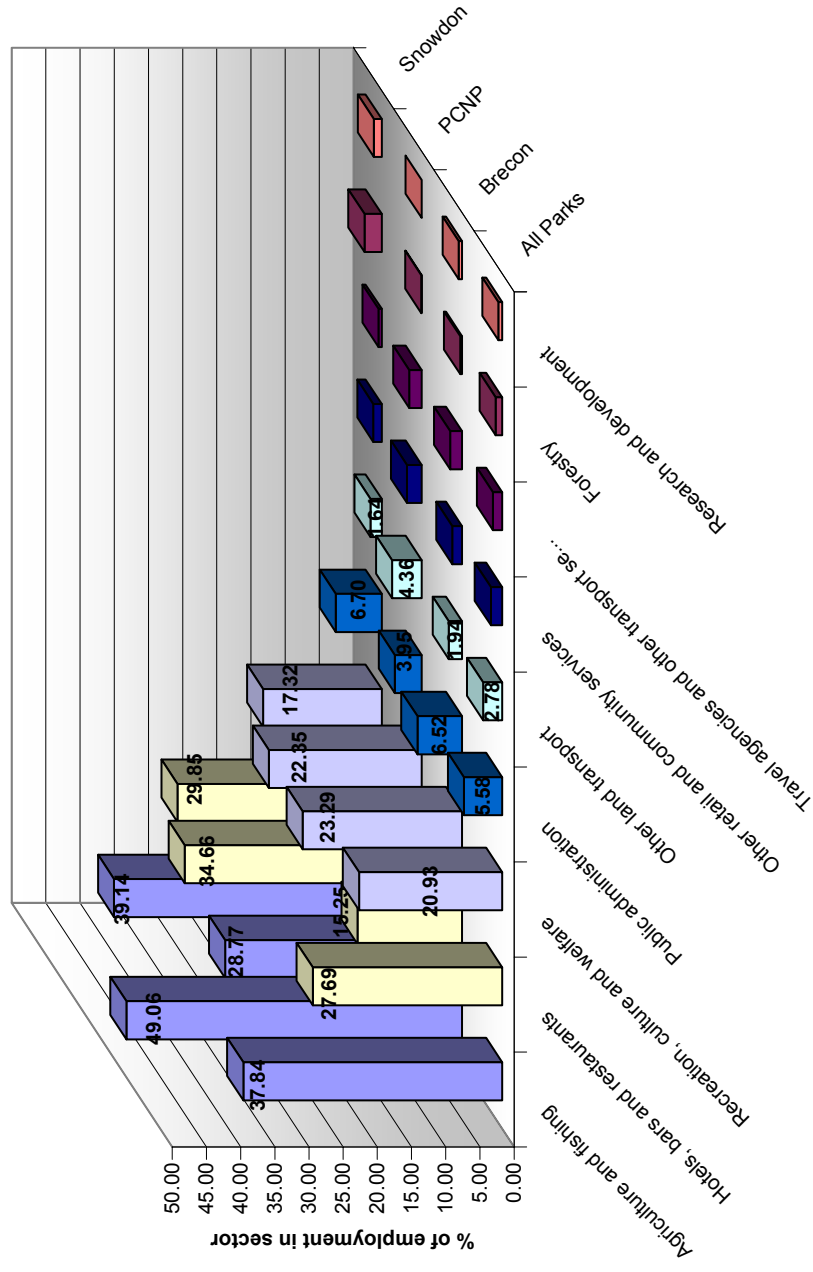
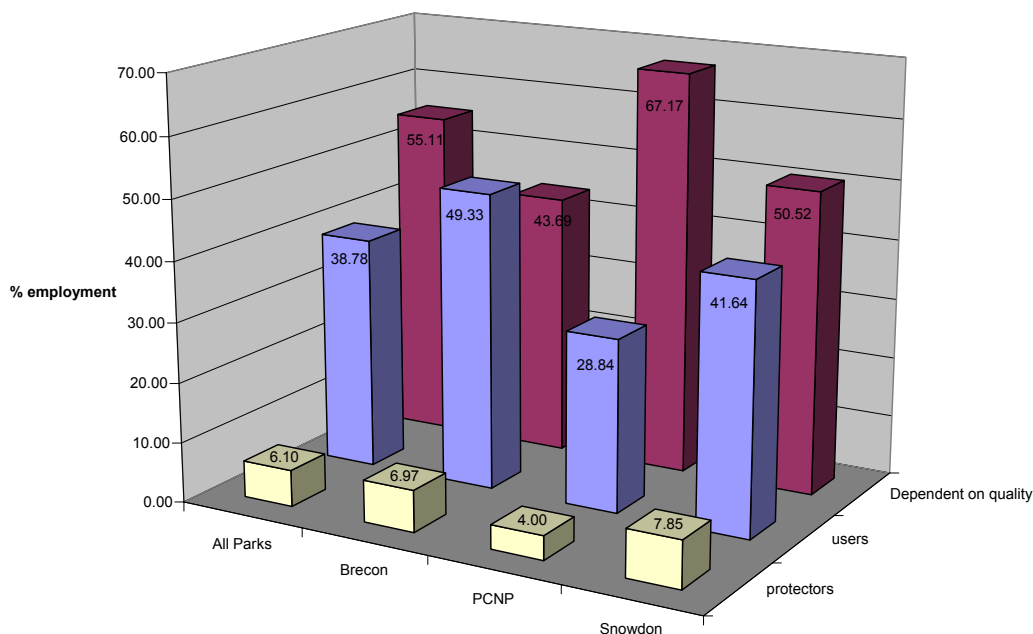


Figure 1: Proportion of employment in sectors within National Parks



**Figure 2: Proportion of employment in environmentally linked activities within National Parks**

### 6.2.1 Brecon Beacons

Total employment, including indirect employment, of the Brecon Beacons is proportionately less (assuming that each of the three would employ 1/3 of the total) that the other NPs, at 27.6% of all NP employment. Direct employment is even lower at a little over one quarter (26.5%) of all direct employment. However, the Brecon Beacons generates more than half (54.6%) of all indirect employment occurring within the NPs of Wales and almost one third (30.6%) of indirect employment outside of the parks. The actual number of employments are however small, 143 and 426 for inside and outside the park respectively.

The four largest employers in Brecon are similar to the Group of Parks; however Brecon differs in the proportions of each. The Brecon Beacons have a larger proportion of employment in Agriculture and Recreation Culture and Welfare, and a smaller proportion employed in Hotels, Bars and Restaurants (Table 20).

**Table 20: Employment by Sector: Brecon Beacons Compared to All Welsh NPs**

Sector	All Welsh NPs		Brecon Beacons	
	Quantity	%	Quantity	%
Agriculture and fishing	4,512	37.8	1,618	49.1
Hotels, bars and restaurants	3,302	27.7	503	15.3
Public administration	665	5.6	215	6.5
Recreation, culture and welfare	2,496	20.9	768	23.3
Total (inc sectors not shown)	11,925		3,298	

Environmentally linked activities in the National Parks of Wales are ranked, in terms of largest employer first, Dependent on Quality of the Environment, Users of the Environment and finally Protectors of the Environment (see Figure 2). Brecon is the one Park which does not conform to this ordering, Users of the Environment, almost entirely agriculture, is the largest environmentally linked category of activity.

Employment is the dominant factor in productivity of the NPs and this is clearly illustrated in the Brecon Beacons. Employment in the park is below the average for all Welsh NPs and total incomes and GDP of the park are likewise below average contributing 27.5% and 28.6% of the respective totals.

In terms of trade flows, the proportion of customers and suppliers to businesses in Brecon is proportionately similar, though numerically there are large differences, to Snowdon (see Table 12); roughly 40:60 split of customers and a 60:40 split of suppliers inside to outside the Park. It also has the highest rate of employment drawn from within the boundaries of the Park, 82.4%.

Together, as the park with largest proportion of employment drawn from within its boundaries and as the largest generator of indirect employment within the park, Brecon Beacons appears to be the most self contained of the parks. In short it appears to draw most of its labour locally and the knock-on effects of direct activity also remain, compared to other parks, largely local.

***Brecon Beacons National Park***

***Summary Point 47.*** *Brecon Beacons is the most agricultural of the NPs of Wales*

***Summary Point 48.*** *Brecon is therefore the only Welsh Park in which Users outnumber those Dependant on the Quality of the Environment*

***Summary Point 49.*** *The Park appears to be economically the most self contained of the Welsh Parks.*

***Summary Point 50.*** *In gross terms, however, it is less productive than the other Parks*

### 6.2.2 Pembrokeshire Coast

Pembrokeshire Coast is the largest contributor of the parks to total employment; some 39% of all NP employment originates in PCNP. The Park has similar direct employment to Snowdonia (around 37% of the total). It has the lowest level of indirect employment inside the Parks (21.8% of the total). However this is more than compensated for by the indirect employment effects occurring outside of the Park; PCNP contributes almost 60% of the total of such employment.

The largest employment sectors are shown below (Table 21). It is notable, both in comparison with the Welsh NP average and the individual parks, that the proportions of agriculture and hospitality are reversed in Pembrokeshire, the only Park where this occurs. This is reflected in the employment in the environmentally linked categories (see Figure 2), more than two third of all employment is in activity which is dependent on the quality of the environment.

**Table 21: Employment by Sector: PCNP Compared to All Welsh NPs**

Sector	All Welsh NPs		PCNP	
	Quantity	%	Quantity	%
Agriculture and fishing	4,512	37.8	1,339	28.8
Hotels, bars and restaurants	3,302	27.7	1,613	34.7
Public administration	665	5.6	184	4.0
Recreation, culture and welfare	2,496	20.9	1,040	22.3
Total	11,925		4,654	

Pembrokeshire Coast National Park is in many ways different to the other Parks, its boundaries are in great part delineated by the physical; it is narrow and is served by a comprehensive network of roads. As a result its boundary is the most porous. While the indirect employment effects suggest this, they are confirmed by the trade flows; of the business in the Park, almost 60% of their employees do not live there, only 19% of their clients are from within it and around two thirds of their suppliers are outside the Park (see Table 12).

PCNP is therefore the least self contained of the Parks, its effects are not restricted to within its boundaries, and it is the park most strongly associated with activities which are dependant on the quality of the environment.

***Pembrokeshire Coast National Park***

***Summary Point 51.*** *PCNP is the most porous of the National Parks of Wales*

***Summary Point 52.*** *PCNP has the lowest indirect employment retained within its boundaries*

***Summary Point 53.*** *PCNP contributes almost 60% of the total indirect employment effects occurring outside of the NPs*

***Summary Point 54.*** *PCNP has the highest proportion of employment in hospitality and therefore in activity dependent on the quality of the environment.*

### 6.2.3 Snowdonia

Snowdonia National Park contributes precisely one third of the total employment of the NPs of Wales. Slightly more than one third (36.8%) of direct employment occurs in Snowdonia. However multipliers in all sectors are generally low; of indirect employments the park contributes only 23.6% of the total retained in the parks and 9.7% occurring outside the parks. It is the only park in which the proportion contributed to total employment is less than its share of direct employment. Further, 33% of indirect employment occurs in the parks compared to the national average of 17%.

Snowdonia conforms to the all Welsh Parks ranking of sectors, agriculture is the largest employer followed by Hotels, Bars and Restaurants, then Recreation Culture and Welfare and finally, the smallest of these four, Public Administration (Table 22).

**Table 22: Employment by Sector: Snowdonia Compared to All Welsh NPs**

Sector	All Welsh NPs		Snowdonia	
	Quantity	%	Quantity	%
Agriculture and fishing	4,512	37.8	1,555	39.1
Hotels, bars and restaurants	3,302	27.7	1,186	29.9
Public administration	665	5.6	266	6.7
Recreation, culture and welfare	2,496	20.9	688	17.3

While the ranks of these four sectors are similar to the Welsh Parks three are above the average, Agriculture, Bars Hotels and Restaurants, and Public Administration. Recreation, Culture and Welfare is below average. Together this and an increase in the proportion of users of the environment due to some measurable employment in

forestry may narrow the difference between users and those dependent on the quality of the environment. Thus, Snowdonia conforms to the NPs average of employment in environmentally linked activities (see Figure 2).

Snowdonia is most similar to Brecon in terms of shape and provision of a roads network, although the balance between users and dependent on the environment tips towards the latter in Snowdonia. This point notwithstanding, the resulting trade flows are similar. The great majority of employees working in the Park also live there (71%), somewhat more than half of customers (57%) to businesses in the Park are from outside the Park and slightly more than half (53%) of suppliers to these businesses are also within the Parks boundaries.

Snowdonia, like Brecon is self contained. Its total contribution, in terms of employment, income and GDP lie between the lower out puts of Brecon and the most productive park of all, PCNP.

#### ***Snowdonia National Park***

***Summary Point 55.*** *Snowdonia has the lowest impact outside its boundaries of all Parks*

***Summary Point 56.*** *Activities dependant on quality are the largest employer in Snowdonia*

***Summary Point 57.*** *Snowdonia retains more of the indirect employment effects within its boundaries than any park*

***Summary Point 58.*** *Due to low indirect job creation Snowdonia is the only park which makes a smaller contribution to total employment than it does to direct employment*

## 7 Case Study Towns

As illustrated in the descriptions of the National Parks above (Section 6) and discussed further in the following section each of the Parks has a distinct character which is determined through a number of attributes, namely shape, ratio of area to boundary length, dominant industries, communications infrastructure, character of surroundings and the topography of the area. Some of these conditions are thought to be pre-existing (prior to NP designation) and may have shaped the economy and culture of the areas which subsequent designation has supported. Much of the character of each Park appears to be explicable. For example, as regards tourism, Brecon Beacons lacks the iconic landscape of Snowdonia but functions as a day visit area for the population of the adjacent South Wales Valleys. The Brecon Beacons NP is the only Park in which users of the environment, almost exclusively agriculture, dominate. However, as the size of agriculture in Brecon Beacons is near the NP average for Wales its dominance is likely due to the lesser development of industries dependant on the quality of the environment.

Likewise the porosity of PCNP is explicable; the Park is physically different from the other Parks of Wales. It is effectively a thin coastal strip which forms a ring surrounding a central non-designated core. This 'ring' of National Park covers approximately 75% of the boundary around the central non-designated area; it is only breached along the line of the A478 between Kilgetty and Pentre Galar. Combined with good the communications infrastructure the effect of the shape and location of PCNP is ease of movement between NP and non-designated areas. Thus PCNP has the largest indirect effects outside of the Park of all the Welsh NPs. Trade flows are atypical of the Welsh Parks; unlike Brecon Beacons and Snowdonia the majority of employees, goods and services, and clients are all from outside the boundaries of PCNP. Again this characteristic of the Park is largely explicable by its attributes.

Snowdonia presents as something of an anomaly. It contributes almost precisely one third of all environmentally linked direct employment in the Parks of Wales and is the park which most closely resembles the Welsh average (see Figure 1 and Figure 2 for example). In terms of shape and communications links and therefore the potential for porosity it is unlike PCNP. In terms of shape, character of surrounding areas and trade flows its effects outside the park and size of multipliers (though not absolute quantities) would be expected to be proportionally similar to Brecon Beacons. There are, however, some marked differences between Snowdonia and Brecon Beacons. Indirect job creation is relatively low in Snowdonia; it is, for example the only Park which contributes proportionally less to total employment (23.6%) in the NPs of Wales than its contribution to direct employment (36.8%).

PCNP clearly illustrates one aspect of the economic relationship between NP and non-designated surroundings; where there are the conditions that support the movements of people, goods and services the Park and its surroundings form an integrated economy: the environmental economy of PCNP has proportional more trade with its surroundings and it is the most similar to the Welsh environmental economy. Several of these conditions are not found in both Snowdonia and Brecon Beacons National Parks.

Assuming the 'propensity to trade locally' consists of willingness and ability to trade it is probable that the propensity to trade with the non-designated surroundings is of interest. The Brecon Beacons Park is surrounded by rural areas on the north, west and

eastern boundaries, the wide open spaces of the Cambrian Mountains to the north for example. The propensity to trade with these areas is constrained by the limited ability to trade; simply put, there are few providers of goods and services in these areas. The solutions are, on the one hand, self sufficiency within the local economy or on the other to direct trade to the areas which can provide the required goods and services; in the case of Brecon Beacons, towards south Wales<sup>5</sup>.

The economy of Snowdonia National Park is the least integrated with its surroundings. Despite similarity to Brecon Beacons it is significantly more self-contained. This suggests some difference between the two in the propensity to consume locally. Case studies of similar types of market town within and outside the National Park used to illustrate the issues. Machynlleth is a market town outside of the Snowdonia National Park. It sits on the junction of A487 and A489 roads which link with the A470 to form a circuit half of which is in the NP, the remainder passes through the surrounding countryside. Dolegellau is situated within the National Park, on the A487 a matter of miles from the north western edge of the A487/A489 circuit described above. Both towns are described by the proprietors of businesses in them, the businesses are broadly vendors of general day to day purchases (newsagents, food stuffs), larger purchases, tourist facilities (accommodation, attractions) and as a meeting place for both locals and visitors, public houses.

### **Newsagents**

The proprietor of the Newsagents in Dolgellau estimated that turnover doubles in the summer months, however *“less people than even 10 years ago visit the area”* While there are tourists in the winter months she thought that these were mainly mountain bikers who brought little economic benefit to the town because they bought petrol at their home place and brought food with them. A former Chairwoman of the Chamber of Trade in the town she lamented that the body was now discontinued due to *“apathy among local business people”*. As a result the former arrangement for late night opening during the Christmas season had been discontinued and replaced by organised coaches to take shoppers out of the town to Chester and Shrewsbury. The proprietor herself went out of Dolgellau when shopping for clothes. Few suppliers were from inside the Park despite requests from US and Australian visitors for local products. This was mainly due to limited availability at appropriate prices; one strange example is a Chinese visitor who bought a souvenir Welsh costume doll which was actually made in China.

The newsagent in Machynlleth is similar in many respects such as the need to travel out of town for her own shopping, difficulty in sourcing local products and seasonality of trade. However estimated increases in trade by tourists were considerably less, around a 40% increase in turnover was suggested.

### **Gift Shops**

In both towns the gift shops sell gifts and toys to local customers throughout the year and enjoy a substantial increase in trade during the tourist season; in Dolgellau turnover doubles while in Machynlleth an increase of 70% was suggested. Both have difficulty sourcing local goods, few are from the local area; much is from wholesalers within Wales but is more likely to be manufactured outside of Wales.

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<sup>5</sup> Searching on, for example, Local Google for providers of goods and services using postcodes or town names within Brecon Beacons National Parks gives providers located predominantly in South Wales.

While the summer increase in trade is greater in Dolgellau this in part needs to be considered against the off season trade; in Machynlleth the proprietor thought he was “*well supported by the locals during winter*” whereas the Dolgellau proprietor described winter trade as “*dreadful*” Both travel outside of their respective towns for shopping trips.

### **Butchers**

In Dolgellau the increase in trade due to summer tourists is estimated to be 30% of turnover. The owner sources the majority of meat locally which is thought to be a plus point in selling to tourists, especially in securing repeat trade. In what approaches irony, this butcher, despite being located in the National Park, has difficulty using the iconic status in his marketing. He does not identify any of his products with the National Park as that provenance is difficult to trace through the chain from farm to shop: this contrast poorly with those outside the Park who tenuously, even non-existent links in the branding of their products. The butcher in Machynlleth has similar increases in trade during the summer. A local business man, he has recently opened an abattoir with the intention of supplying his own and other butchers. Some benefit in reduced costs is expected and some added value in providing a fully local product. Both businesses are successful in their rural towns despite in spite of the decline of retail butchers in urban areas.

### **Cycle Shop**

Both towns have cycle shops, both are relatively new having been established for 2 and 3 years in Machynlleth and Dolgellau respectively. Both shops estimate around 50-60% of turnover is from locals and that their trade, while still seasonal, is less so than other businesses in the area. The Machynlleth proprietor suggested that the town, while acting as a gateway to the NP, offers many cycling experiences of its own. As such he suggested the east and south of the town are as important to cyclists as the National Park to the north. This was confirmed by the Dolgellau proprietor; while the benefits of international recognition for Coed Y Brennin had led to increased visitor numbers, many visited the park as part of a tour of biking venues, staying 2-3 days at each place. The benefits of international recognition he thought were felt both in the Park and at various locations in the vicinity both in and outside the NP.

### **Antiques shops**

The antiques shops in the towns differ a great deal. In Dolgellau the proprietor recognises the limitations of selling only antiques, a point his fellow traders have advised him of, and has attempted to ensure viability by selling gifts and including a coffee shop on the same premises. Around 25% of the antiques are sourced from within the NP, while all the food on sale is made on the premises from ingredients purchased, but not necessarily produced locally. By contrast the Machynlleth proprietor is considering closing the shop and selling antiques on the internet. Location does not appear to be the reason for the Machynlleth antiques dealer to consider such action. His business is affected by the same factors as the Dolgellau antiques dealer; the business is not sustainable on its own. Where the Dolgellau dealer has recognised this and taken action, by diversifying the business, the Machynlleth dealer has not.

### **Public Houses**

Publicans in both towns have different views to those their fellow business people hold; both suggest there are increases, not the decreases suggested by others, in the tourist

trade. While both experience some seasonality it is largely predictable and complimentary to their year round trade. Both have a range of regular events and clients; darts, quizzes pool and local bands are regular features which attract both locals and visitors. The Machynlleth Publican suggested that while the NP may attract trade for his Dolgellau counterpart, he was able to provide food and accommodation to visitors of the attractions which were located outside the park such as quad riding and paint balling; he suggested that such activities would not be permitted in the NP.

### **Supermarkets**

Both towns have supermarkets which employ between 45 and 50m permanent staff and a further 10 summer staff. As would be expected, while both are relatively large employers in the towns neither has a policy to purchase local goods; both are supplied from distribution centres in England. Turnover in both is limited by the size of the local population not planning restrictions. While this is true, in the NP some difficulties were experienced due to limits on the development of the existing building. The size of the building limited the range of goods the company could display while maintaining the legal width of shopping aisles. The problem was resolved by reducing the amount but not the range stock on display. While this results in more frequent restocking it is not considered to be a problem.

In effect the businesses of both towns share remarkably similar constraints and opportunities. They both cater to two sets of client types/needs. The first is to local people. Businesses appear to provide for the day to day needs of the community; both towns have a smaller supermarket, retailers of fruit and vegetables, meat and public houses which offer a range of social activities. However, for larger purchases and more selective shopping (such as Christmas shopping) residents, including many of the proprietors themselves, travel to larger towns such as Aberystwyth, Chester and Wrexham. The second type of client is the holidaymaker, the majority of who arrive during the summer months. While this is true in both towns, some traders, particularly those capturing the 'newer' activities of for example mountain biking are aware of some reduction in seasonality. However it remains that substantially more of the trade in both towns occurs during the holiday season.

Both towns are constrained by the volume of year round trade; few can afford to maintain the peak capacity of the summer year round. This is seen in the loss of Christmas Shopping trade and other larger purchases to other larger towns. Thus retailers tend to be small and specialised serving local needs only. The exception to this is perhaps the new abattoir in Machynlleth which will serve a wider area than the town.

The nature of these rural economies seems to limit the possibility of sourcing locally produced goods. This is seen in a number of ways; both public houses are run by tenants, the owners of both are owned and supplied by brewers based in England. Likewise the larger employers in the towns, the supermarkets are supplied by central distribution centres. Even the small retailers are limited, while, for example goods may be cooked locally, not all the ingredients are bought locally and, of course, even less are produced locally. Again the exception to this is meat. Largely the goods sold to tourists are, ultimately, not local products. The extreme example is the Welsh costume doll made in China.

These restrictions by their similarity seem to suggest that they are unconnected to the designation of National Park; they appear to be the conditions of relatively remote

market towns. As such both rely on supplies of goods and services from wholesalers in larger towns. In effect, Machynlleth and Dolgellau each provide for day-to-day needs of locals and a similar range of goods and services for visitors. Where the surroundings of Brecon Beacons are limited in the ability to trade with those in the park due to limits on the availability of goods and services, trade between Snowdonia and its surroundings appears to be limited by the similarity of goods and services available. In short, what goods and services are available in Machynlleth that are not available in Dolgellau and *vice-versa*? And as a result of this, what reason is there is little reason for those in the Park to trade with those in the surroundings of the Park. Both are subjects to similar conditions and therefore have similar levels of self sufficiency and reliance on central suppliers in distant towns.

## 8 Discussion

There is some perception that the National Park designation is a limit on economic activity; strict planning restrictions designed to protect the environment and limited development in some way imply that the environment and development are mutually exclusive.

This perception may be misplaced because as this study shows the environment is a more significant component of the economy of the National Parks than in the rest of Wales. This is hardly surprising given the reason for the designation. The original VoE study (Bilsborough & Hill, 2002) found 1 in 6 (17%) of Welsh jobs are linked to the environment, in all three National Parks this rises to more than twice that rate, to over 38% (Table 23). Much of the difference is seen in the dominance of those sectors which use the environment (mainly agriculture) and those which depend on quality of the environment (mainly tourism related sectors). Agricultural employment is slightly more than 1% of all employment in Wales, in National Parks this raises to over 5% in Pembrokeshire, almost 10% in Snowdonia and over 12% in Brecon. The same effect in tourism is ably illustrated by the levels of employment in Hotels Bars and Restaurants: although a considerable employer throughout Wales (6.61%) the proportion in the NPs is even larger, ranging from a relatively lowly 9.22% in Brecon through to 15.71% in Snowdonia and 16.97% in Pembrokeshire.

**Table 23: Proportion of employment by sectors in National Parks**

Industry/Product Groups	% jobs in sector		
	Brecon Beacons	Snowdonia	Pembrokeshire Coast
Agriculture and fishing	12.47	9.46	5.26
Forestry	0.08	0.64	0.02
Hotels, bars and restaurants	9.22	15.71	16.97
Other land transport	1.84	1.43	3.29
Sea and air transport	0.03	0.01	1.58
Travel agencies and other transport services	1.43	0.39	1.12
Research and development	0.50	1.02	0.02
Recreation, culture and welfare	12.33	8.85	9.46
Other retail and community services	0.78	0.64	0.96
<b>Total</b>	<b>38.7</b>	<b>38.1</b>	<b>38.7</b>

Direct incomes generated by activity linked to the environment in the NPs amount to £146.75million; indirect incomes within the parks of £2.74 million and indirect incomes outside the park of £27.33million. Total incomes amount to £176.82million.

Clearly then there is not a lack of economic activity in the National Parks, rather it is more closely focused on the environment and is therefore distinct from the rest of Wales.

Interviewees provide some clarification and raised issues relating to this 'distinctiveness'.

Firstly, not all economic activity occurring within the parks is captured there:-

- Farmers in Snowdonia, particularly on the higher ground, are bound tightly to stratified sheep production. While the mountain and upland sheep are raised in the Park, the profitable end product, crosses with lowland sheep, are fattened

on lowlands often outside of the Park. The low value end of the production chain occurs in the Parks, the higher value outside; sheep sales in the Park are of lower value than sales outside the Park. Often, despite ownership being inside the Park, sales outside the Park means the value is lost to the Park.

- The North Wales Tourism Partnership estimate that 50% of visitors to the region visit Snowdonia NP but spending is low; the Mid Wales tourism partnership estimate the spend of a tourism trip at £36.95, spending in the NPs is thought to be only around one third of this. Several explanations were offered; visiting NPs is one element of a longer stay elsewhere in Wales. In North Wales 64% of tourism is in self catering caravans. Given almost ubiquitous car ownership then the costs of day trips to the Park, including meals, fuel and so on, are incurred at the holiday centre. Little or no spending is made in the Park.
- Branding of the NPs is, to tourism managers, an issue. Estimates from Pembrokeshire suggest that 80% of visitors in the NP are not aware they are in a National Park. The figure is thought to be similar in the Brecon Beacons and perhaps lower in Snowdonia. However icons such as Snowdon are used in branding of products such as Snowdon Mountain Cheese which is, somewhat misleadingly, not produced in Snowdonia. This failure to capture “*the brand Snowdon*” in Snowdonia often occurs. Travelodge sell rooms on “*views of the National Park*” capturing some value of the National Park without being located there. Tariffs for accommodation within the NPs however are not thought to be different to similar establishment outside the Parks.
- Occupancy rates of Bed and Breakfast accommodation in the Park are similar to outside the Park. However this is often a management choice. The Regional Tourism Partnerships of Wales are aware of significant under occupancy for the available accommodation resource; all the partnerships have difficulty encouraging uptake of schemes to increase occupancy largely due to many of the smaller businesses being a “*lifestyle choice*” of semi-retired people or with other sources of income.

Secondly, the parks are distinct one to another, not only in terms of the activity within the park boundaries but how and where the interaction of the parks with the rest of Wales occurs. The theory of the ‘halo’ or ‘dough-nut’ effect is well known: it is often thought of as economic activity which has been displaced, due to restricted development within the park, to its periphery. In effect the services and goods to the NP are in part located outside the park.

Pembrokeshire Coast has the largest multipliers but is highly porous, up to 95% of indirect effects occur outside of the park. It is also the only park of the three in which the majority of suppliers are located and employees live outside the park (Table 12). The park is of course bounded by the sea on one side; interaction can only be in one direction. Given that the economy of the park is strongly based in activities which are dependant on the quality of the environment such as tourism and leisure then the interaction with surroundings is likely to be for the necessities of this sector, such as labour and catering supplies. Wages in the sector are generally poor, only retail wages are on average less than those in hotels, bars and restaurants. Thus the halo is likely to be within the immediate surroundings of the park and is largely displaced employment.

While it has a portion of its boundary is coastal the majority of Snowdonia’s boundaries are terrestrial. However most of the hinterlands of the NP are rural and in fact not greatly dissimilar to the NP itself. The park is large (compared to Pembrokeshire Coast) and proportionately almost rectangular. The strongest element of its economy is activities which are dependant on the quality of the environment such as tourism. Much of the tourism is focused on the western edge and northern half of the park. The scale and shape of the park and the location of the centres of tourism in relation to the borders of the park ensure a degree of ‘self sufficiency’. Distances from the tourism centres to the boundaries are large and commuting for employees is therefore not likely to be a cost effective option.

Economically the Brecon Beacons NP is a hybrid of the two in terms of interaction. In shape it is most similar to Snowdonia, though all of the boundaries are terrestrial. However the northern, eastern and western edges adjoin rural places. The southern edge faces the heads of the south Wales valleys. Thus only one quarter, the southern edge of the park, has a significant ‘halo’. Tourism managers and the MWTP describe Brecon Beacons as the least developed (at least in terms of tourist attractions and facilities) of Wales’ National Parks. It is described as largely underdeveloped in terms of infrastructure yet is traditionally a popular destination for the residents of the south Wales valleys. The south Wales economic region has been shown in other studies (Hill and O’Sullivan, 2003; SERS, 2005) to have a strong propensity to consume locally due to the availability of services and goods. It is likely that the Brecon Beacons halo is in fact linear, located to the south and likely to be weak, even inconsequential, compared to the indigenous activity of the south Wales region.

In total the economic activity linked to the environment in the three National Parks of Wales make a considerable contribution to the economy; 11,926 jobs, incomes amounting to £176.82million and a total contribution of £204million to GDP. In terms of productivity per square kilometre the Parks lag behind the rest of Wales. The Parks cover almost 20% of Wales but produce only 9% of the total environmentally linked GDP estimated by Bilsborough and Hill (2002). This low productivity seems to be contradicted by the fact that mean productivity per person in employment is actually greater in the National Parks than in the rest of Wales. The mean national direct productivity per employment (GDP/total direct employment) in Wales is £9,702.83 (Bilsborough and Hill, 2002) in the three National Parks it is £14,820 (see Table 24).

**Table 24: Mean productivity per employment in environmentally linked industry**

	<b>GDP/person direct</b>	<b>GDP/person total (inc. indirect)</b>	<b>Multiplier coefficient</b>
All Wales	£9,702.83	£13,978.46	0.44
Brecon Beacons	£14,770.60	£17,768.51	0.20
PCNP	£14,033.47	£17,308.29	0.23
Snowdonia	£15,785.92	£16,508.17	0.05
All National Parks	£14,820.18	£17,167.38	0.16
Wales excluding National Parks	£9,315.11	£13,736.84	0.47

An explanation of this apparent anomaly seems to be the low population density of rural places (see Table 25). PCNP has the closest employment density to the rest of Wales (7.5 in PCNP, 9.5 in the rest of Wales) and is the only Park to contribute a larger proportion to national productivity (3.4%) than its proportion of land area (3.0%). Snowdonia has the lowest density of jobs and the greatest disparity between land area (10.5%) and contribution to GDP (1.8%). Clearly employment density is the

critical factor. However this raises two further issues; why is mean productivity per person greater in the National Parks? And, why are the multipliers relatively low? (The lower multipliers can be seen in the mean total productivity per employment shown in Table 24).

**Table 25: Proportional contribution of National Parks to the Environmentally Linked Economy of Wales**

Area	Land area (as % of Wales) <sup>6</sup>	Jobs (as % of Wales)	GDP (as % of Wales)	Jobs/km <sup>2</sup>
Brecon Beacons	6.5	1.9	2.5	2.4
PCNP	3.0	2.7	3.4	7.5
Snowdonia	10.5	2.3	2.8	1.8
All Welsh National Parks	19.9	7.0	8.7	2.9
Wales (excluding NPs)	80.1	93.0	91.4	9.5

Both issues may be explained by the similarity of Brecon and Snowdonia National Parks and the considerable difference between those two and Pembrokeshire Coast National Park. The economic activity of Pembrokeshire Coast NP is closely focused on tourism and its form and location allow, if not cause, easy commuting by employees and transportation of goods. As a result the ‘halo’ effect is most prominent around the PCNP; it has the largest effects on areas outside of the Parks, contributing almost 60% of indirect employment outside of the Park. It is also, in terms of employment density and the ratio of land area to contribution to GDP the Park most similar to the non-Park areas of Wales; it appears PCNP is the most integrated with and similar to the rest of Wales of all the parks. The physical characteristics of the park and its surroundings allow integration while the designation of National Park (and therefore the stringent development controls) drives integration by displacing development to areas outside of the Park. In short, in PCNP there is both the motivation and the ability to integrate with the wider economy.

In contrast, those forces are modified to somewhat different degrees in Snowdonia and the Brecon Beacons. Both have a stronger agricultural base than Pembrokeshire (particularly Brecon Beacons) and neither has the ease of commuting and transport of Pembrokeshire. The result may be a greater level of self sufficiency in the economies of these two Parks. Examples provided by interviewees include:

- Contracting work in agriculture is likely to be provided by others within the park
- Much of the hospitality industry uses local food to enhance marketability
- Costs and difficulties in commuting and transporting of goods ensures that some local services, unviable elsewhere, are economically viable in the NPs; small bakeries for example.
- Both Snowdonia and Brecon Beacons have large rural hinterlands exacerbating the problems of commuting and transport

<sup>6</sup> Actual areas are: Wales 20761km<sup>2</sup> ; Brecon Beacons 1347 km<sup>2</sup> ; PCNP 620 km<sup>2</sup> ; Snowdonia 2171 km<sup>2</sup> ; all National Parks 4138 km<sup>2</sup> ; Wales (excluding the National Parks) 16623 km<sup>2</sup>

- Both Parks have a section of the NP boundary adjacent to more urban areas. While some integration is likely around this area it is unlikely to extend deep into the park.

Thus there are restrictions due to communications and transport on the ability to integrate with the wider economy and in both hospitality and agricultural sectors some incentive to trade within the Park (using local products and contractors). However an important factor in the integration with the wider economy is the opportunity to do so. In Pembrokeshire this is clear and consequently some form of the halo effect is likely. In contrast the market towns in the surrounding areas of Snowdonia National Park are likely to be subject to similar opportunities and constraints as those in the Park. In consequence the types of suppliers are similar and the potential to trade between towns in the NP and towns close to the NP is negated; there is no differentiation and therefore no need to conduct trade. The halo of Snowdonia and by extension to the structurally similar Brecon Beacons is likely to be displacement to larger towns, in form it is more likely to be focused on few towns rather than a contiguous band outside of the Parks boundaries.

The environment of the NPs is a strong attractor of tourism, particularly in Snowdonia and Pembrokeshire, although they appear somewhat weaker in capturing the economic activity. This raises an important issue on the measurement of economic value of the environment: as attractor but not receiver of the economic benefits of tourism: a great part, perhaps the majority of the value of the environment of the national parks is captured elsewhere. Examples include the NPs as day visit attractions with accommodation and other spending made at other locations, the marketing of accommodation outside the park on 'National Park views' and the branding of products and services. These types of value are difficult to quantify. For example, what proportion of the value of a holiday near the Park can be attributed to the Park? Likewise what proportion of the value of, say, a Snowdonia lamb is due to the Park? In effect, a significant part of the value of the environment of NPs is apparent elsewhere and it is difficult to attribute some part of that value to the National Parks. This is not a methodological issue *per se*, any estimation method will be subject to these limitations; rather it is one of definition and linkage. This is amply demonstrated by the experience of the Regional Tourism Partnerships. While more than 80% of visitors cite the environment as the reason for visiting Wales, spending per visit within the Parks is estimated by the MWTP to be only one third of spending per visit in the rest of Wales.

A further limitation on the value is the inability of the economic sectors in the parks to accurately reflect the value of the environment. Tourism, for example, which is of great significance in the National Parks, is one of the few sectors in Wales in which part time positions outnumber full time employment. It is also highly seasonal. The second major employer is agriculture; it also offers low wages though not the seasonality or dominance of part time work seen in tourism employment. As a result the average annual income of the environmentally linked employment in the parks is £14,827 compared to the Wales average of £19,853.

## 9 Conclusions

Whether or not it is the outcome of a conscious management policy, the three National Parks of Wales form a suite of considerable variation. Considered as landscapes they contain dramatic mountains, coastal cliffs and rolling hills. As places of employment there is a strong focus on environmentally linked industries; proportionately more than twice as many people work in the environmental economy in National Parks than in Wales as a whole. Although the National Parks are designated on the grounds of their landscape and environmental attributes they make a considerable contribution to the wider economy as illustrated in the findings below:

- Economic activity linked to the environment in the NPs make a considerable contribution to the economy of Wales; 11,926 jobs and incomes amounting to £176.82million.
- The original VoE study found 1 in 6 (17%) of Welsh jobs are linked to the environment, in the NPs this rises to more than twice that rate, to over 38%.
- Much of the difference is seen in the dominance of those sectors which use the environment (mainly agriculture) and those which depend on quality of the environment (mainly tourism related sectors).
- Total direct employment relating to the environment of the national parks of Wales amounts to 10,255 jobs.
- Indirect employment for the three National Parks is 1,671
- 17% of indirect employment is within the National Parks, more than four fifths (83%) of indirect employment occurs outside of the National Parks.
- Together the three NPs of Wales generate considerable income, direct income is £146.75millions, a further £30.07 millions of indirect income is generated; £2.74millions within the parks and £27.33millions to the rest of the Welsh economy. Only 9% of the indirect incomes are retained within the NPs, 91% of indirect incomes are made outside of the NPs.

The table below (Table 26) captures the main results by Park and in total.

**Table 26: Summary of employment and incomes of environmentally linked economic activity in the National Parks of Wales**

<b>Indicator</b>	<b>BBNP</b>	<b>PCNP</b>	<b>SNP</b>	<b>Total</b>
<b>Employment</b>				
Direct employment	2718	3762	3775	<b>10255</b>
Indirect employment in NP	153	61	66	<b>280</b>
Indirect employment outside NP	426	831	135	<b>1392</b>
<b>Total</b>	<b>3279</b>	<b>4653</b>	<b>3975</b>	<b>11926</b>
<b>Incomes (£k)</b>				
Direct incomes	40 169	51 414	55 165	<b>146 748</b>
Indirect incomes in NP	1 252	774	714	<b>2 741</b>
Indirect incomes	7 230	16 197	3 899	<b>27 326</b>

outside NP				
<b>Total</b>	<b>48 651</b>	<b>68 385</b>	<b>59 779</b>	<b>176 816</b>

Productivity in the National Parks is lower than in Wales as a whole; the Parks cover some 20% of Wales but contribute around 9% of GDP. This, in terms of Valuing our Environment, is the crux of the matter; is the proportional contribution low because GDP is a poor measure by which to evaluate the output of the designated areas? This research would suggest not; the two reasons are outlined below.

Firstly, lower than average GDP/km<sup>2</sup> is due to a combination of circumstances which occur in rural areas generally and in National Parks in particular. Mean productivity per person in the National Parks of Wales is higher than the national average (see Table 24); total productivity of the Parks is lower than average simply because there are fewer people employed there. Individually Brecon Beacons and Snowdonia conform to this idea. PCNP is the exception; it has the greatest density of employment and it is the only Park which has similar productivity/km<sup>2</sup> to the rest of Wales. It also, due to its shape and hence the porosity of its boundaries, has the strongest links to the wider economy. Brecon Beacons and Snowdonia tend to be more self sufficient as illustrated by larger indirect effects inside their boundaries than outside and lower cross boundary flows of labour, goods and services (Table 12). GDP is therefore as suitable a measure inside the Parks as it is outside; within the limitations of the measure it is no better or worse in reflecting productivity in environmentally linked activity as in other activities.

Secondly, if GDP was a poor measure then it should be consistently poor; this does not occur. In PCNP productivity is similar to the rest of Wales, in the other two parks it is lower yet each offers a similarly high quality of environment. In all, productivity per person is greater than the national average. This would suggest that other factors than the environment impact on GDP. These include the density of employment discussed above and the other sources of variation across the Parks discussed below.

There is evidently some difficulty in capturing the total economic benefit of the environment within the Parks. Of the three Parks, the economy of PCNP is the most closely focused on tourism. Trade flows and indirect effects outside the Park suggest that its boundaries are highly porous. Somewhat paradoxically this has the effect that the economic impact of the many people who visit PCNP, to walk the coastal paths for example, while lost to the defined area of the park is traceable. The halo or doughnut of displaced economic activity is evidence of the capture of tourism activity. In other words, the coverage of the economic impact is larger than the Park itself but is largely apparent close to the Park. This is less clear in the Brecon Beacons and Snowdonia National Parks. Visitors are thought to spend less in these Parks and often visit the Parks as part of a longer stay. However their impact is more dispersed than PCNP; their halos are not so clearly defined. Both Parks have large rural hinterlands. Brecon Beacons has the populous South Wales Valleys along one edge. Likewise Snowdonia has the North Wales road links to the West of England where the effects can be subsumed into the wider economy. This, of course, is not to say the impact of these two is any less than that of PCNP only that it is less easy to trace. The examples of the case study towns, one in and one outside of Snowdonia National Park, suggest that the Parks and their hinterlands are subjected to very similar constraints and opportunities. They are, first and foremost relatively remote rural market towns. This seems to override the effects of National Park designation with the result that, as

regards availability of goods and services one town closely resembles the other. There is therefore little reason for trade between the two, both are likely to source goods and services from the closest large town. The halo of these Parks is, as a result, not dispersed over a contiguous area but focused on a larger town where it is subsumed into the larger economy. This effect could be termed as the lost impacts.

While the Parks as designated areas may not be wholly recognised by visitors the quality of the environment they contain is at least part of the reason for visiting the region. The economic impacts, however, occur elsewhere; for example as accommodation outside the park. Similarly there is no return to the Park from branding of products.

Users of the environment in the National Parks are predominantly agriculturalists. In terms of employment agriculture is largest sector in the Brecon Beacons and Snowdonia. The different practices of each are reflected in the multipliers of 1.26 in Brecon and 1.10 in Snowdonia. While both are low, the indirect effects in Brecon are almost twice those in Snowdonia though both are similarly distributed between in- and outside of the Park (see Table 5). Sheep farming at the most elevated level of the stratified production system predominates in Snowdonia. In terms of labour and services the sector is highly self-sufficient - it therefore generates little multiplier effect. The less mountainous lands of the Brecon Beacons permit a different level of the stratification and other forms of agriculture which are less self sufficient and so generate greater multipliers. Both however are subject to the wider pressures on producers of primary product - such as diminishing returns. Snowdonia, dominated by the level of stratified sheep production closest to the primary production/furthest from added value may suffer this more acutely than Brecon. This demonstrates the difficulty of agriculture in reflecting the full environmental sourced value of its products, as important sectors within the Parks the value of productivity there is likewise affected. Snowdonia reaps the lowest benefits as it is the Park in which production is closest to primary and therefore furthest from the added value of final product. Agriculture in Brecon Beacons is a step further along the stratified production system and appears to obtain some greater economic benefits. In short, agriculture, like tourism, is a dominant sector in the economy of the National Parks. The agricultural systems of the National Parks are those that are suited to the topography and climate of the Parks. These systems tend to be at or near the beginning of production chains. Put simply, the agricultural production in the National Parks is the foundation for a system of production that gains more added value closer to market. The larger economic benefits found in added value are lost to the Parks.

Environmentally, National Parks of Wales benefit from the added protection of the designation. The quality of the environment, both natural and built, is managed with quality not profitability as the aim. This is often perceived as a limit on development. However this research would suggest that this is not true; rather the protection of the designation reinforces and supports what would occur naturally. Although tourism development along the north Wales coast is likely to have occurred even without the National Park being designated, with it, the natural beauty of the park is protected and the development of the north Wales coast is underpinned by the displacement or halo effect from the Park. This effect is modified according to shape, location and industry within the Parks; contrast 'self contained Snowdonia' to 'porous Pembrokeshire' for example. Most importantly this suggests, in the words of one interviewee, "...*that we can have our cake and eat it!*" We can have the pristine environment that the protection of the National Park designation support without inhibiting economic

activity. The economic activity which occurs is either that which is most suited to the area (such as in the case of agriculture) or is displaced outside the park (for example accommodation for tourism). It is likely that the quality of the environment plays a more active role, as attractor of visitors, as icon for Welsh tourism and brand image for both tourism and agricultural produce. While they are acknowledged it is difficult to quantify these effects.

In achieving the aims of promoting 'quiet enjoyment' the National Parks of Wales are undoubtedly successful. The Tourism Partnerships recognise the appeal of the areas they cover even though many visitors are unaware they are in a National Park. That the beauty and attractiveness has been maintained without overt awareness suggests the designation has achieved its objective. It is remarkable that this study has shown the management of these areas as designated National Parks has not inhibited economic activity, and indeed in some cases it has promoted economic activity.

## 10 Suggested Indicators

This research has shown that the National Parks of Wales make a considerable contribution to the wider environmentally linked economy. In terms of contribution/km<sup>2</sup> the National Parks input to the economy is less than the national average. However this is due to lower population density, a characteristic of rural places in general, rather than, as commonly thought, some restriction imposed by the designation. The finding that employees in the National Parks are more productive than their counterparts outside the designated areas further refutes the supposition that the Parks restrict development.

Across the three parks there is considerable variation in the economic outputs. This is apparent in absolute terms (such as the number of direct employments) and in such measures as the proportional contribution of the various industries, the multiplier effects of both industrial sectors within Parks and of each Park as a whole and of the scale of impacts inside and outside the boundaries of the Parks. Wherever variation occurs it is explicable and quantifiable. Thus GDP is found in this research to be a consistent and transferable measure of environmentally related economic activity. Use of GDP allows comparisons between Parks, between industrial sectors, between the Parks and the wider economy and so on using a consistent metric. Importantly, this measure is commonly used and widely understood; as such it is simply and conveniently communicated to a range of target audiences. In short, conventional economic measures can be used to illustrate, in considerable detail, the shape and magnitude of the environmentally linked economy.

In suggesting indicators several issues are considered:

1. The suitability of conventional economic measures to illustrate and communicate the magnitude and shape of the environmentally linked economy.
2. Their remit does not direct the National Park Authorities towards objectives which are easily measured by conventional economic measures; rather it is directed towards environmental and social aims which underpin the viability and equity of the economic activities in the Parks. Thus the impact of the National Park Authority's influence is not readily apparent because others, both inside and outside the parks, capture the financial benefits of their work to improve the environment.
3. National Park Authorities are obliged to monitor and evaluate their performance against their aims and objectives; each Authority has a set of indicators which are used in evaluation.
4. Some of these indicators offer an inconsistent metric. Perception surveys, for example, are specific to both the objective and its location. They are limited in ability to be transferable issue to issue (from a housing to an amenity objective); they are not directly comparable in a benefits-cost type analysis and, as they refer to a baseline which may vary from place to place, are not transferable between places (PCNP could not be compared to Brecon Beacons).
5. There is no evidence in this study that the National Park designation restricts economic activity. It is suggested that the economic activity in the parks is of the type that would occur 'naturally' due to the physical and social structure of

the rural area. National Park status, by managing those physical and cultural attributes, enhances their resource value while ensuring any use of them is sustainable.

Consequently it is suggested that the conventional economic measures as used in this study are appropriate indicators of the volume and shape of economic activity in the National Parks. They are accepted, widely used measures which are transferable, consistent and due to their wide acceptance, reasonably well understood by a wide range of people. Their wide use and commonly employed metric also ensures a range of methods of analysis and comparison such as benefit-cost analysis and discounting, further extending their usefulness. This allows, for example, National Park to outside the Park, inter-Park and inter-sector comparisons

While these measures have been employed in gross terms there is considerable opportunity to refine the measures. For example the findings of this study provide a baseline for such measures as average income to which target groups can be compared. These target groups, of course, could be defined by any criteria that are pertinent to the aims and objectives of the National Park Authority such as age group, gender, location, employment sector and so on. Issues of equity and opportunity can be investigated through cost of living to income ratios using similar selection criteria to those mentioned above. Thus there is a wide range of methods which can be employed to 'drill down' from the larger, say National Park economy to specific defined groups or areas.

This, however, does not fully address the assessment of sustainability. It covers comprehensively the economic component of sustainability; it can be used to measure some of the social aspects such as equity and opportunity, but does not take account of the environmental component. As noted in point 3 above, the National Park Authorities have in place systems of monitoring and evaluation. These, of course conform to the remits of the Authorities and are likely to have been the subject of comprehensive design and development. The additional complexity of replicating, replacing or otherwise adding to these systems is unnecessary and likely to be counter productive. Rather, as the economic measures can supplement and support these existing indicators then the three aspects of sustainability can be jointly reported to give a considered and comprehensive evaluation. For example in the case of improved water quality due to reduced pollution from an industrial sector, the water quality indicator can be reported jointly with the economic data on employment, incomes and GDP/employee together with a summary statement, thus:

*“...water quality can be seen to have been significantly improved due to reduced emissions without engendering negative economic effects”*

This goes some way in ensuring that outputs are comparable and transferable and opens up the opportunity to a wide range of benefit-cost assessments.

In summary, the suggested indicators of sustainability are the economic measures similar to those in this study which are used to supplement, support and broaden the range of assessment currently conducted by the National Park Authorities using their existing sets of environmental and social indicators. Together these indicators and measures address the environmental, social and economic components that together constitute sustainability.



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## **12 Appendices**

## **Appendix A. Income Multiplier Relationships (all industrial sectors), Brecon Beacons National Park**

**Table 27: Appendix: Income Multiplier Relationships, Brecon Beacons National Park**

Sector	Incomes created directly	Incomes created indirectly within NP	Incomes created indirectly in rest of Wales	Total income creation	Income Multiplier
Agriculture and fishing	218.8	8.7	24.4	251.8	1.15
Forestry	264.4	2.9	21.6	288.9	1.09
Mining and quarrying	117.3	0.6	21.8	139.7	1.19
Meat processing	1.3	0.2	45.1	46.6	35.85
Dairy products	5.0	0.4	29.3	34.7	6.94
Other food products	6.8	0.3	35.0	42.1	6.19
Drinks and tobacco	32.2	1.4	6.8	40.4	1.25
Textiles	15.5	0.2	18.6	34.3	2.21
Clothing and leather products	39.6	0.4	7.6	47.6	1.20
Wood processing and products	237.7	8.9	49	295.7	1.24
Paper and paper products	-	-	-	-	-
Printing and publishing	38.6	0.4	31.1	70.1	1.82
Oil processing	-	-	-	-	-
Chemicals and chemical products	12.4	0.5	126.9	139.9	11.28
Rubber and plastic products	38.6	0.6	102.4	141.6	3.67
Other non-metallic mineral products	209.9	4.3	47.1	261.2	1.24
Metal products	24.7	0.5	182.2	207.5	8.40
Engineering products	193.4	8.3	88.4	290.0	1.50
Motor vehicles	222.8	17.3	91.5	331.6	1.49
Other transport equipment	31.3	0.4	144.7	176.4	5.64
Other manufacturing and recycling	22.5	0.6	54.4	77.5	3.44
Electricity	-	-	-	-	-
Gas	-	-	-	-	-
Water	121.9	1.9	28.2	151.9	1.25
Construction	134.5	4	54.9	193.4	1.44
Motor vehicles, sales and repair	298.6	7.5	33.9	340	1.14
Wholesale	148.2	5	38.7	191.8	1.29
Retail	122	3.2	43.4	168.7	1.38
Hotels, bars and restaurants	169.4	2.3	21.2	192.9	1.14
Railways	-	-	-	-	-
Other land transport	244.5	3.4	27.1	275	1.12
Sea and air transport	6.4	0.2	6.5	13.1	2.05
Travel agencies and other transport services	287.4	8.4	33.8	329.6	1.15
Postal services	33.0	0.2	39.8	73.0	2.21
Telecommunications services	19.0	0.5	33.9	53.4	2.81
Financial intermediation and insurance	43.7	1.7	66.3	111.7	2.56
Property	104.4	0.0	0.9	105.3	1.01
Legal and accountancy services	190.2	1.9	27.4	219.6	1.15
Computer and related services	182.2	2.1	12.3	196.6	1.08
Research and development	294.7	2.7	5.7	303.1	1.03
Other professional business services	168.9	2.2	28.8	199.9	1.18
Public administration	147.9	3.8	83.4	235.1	1.59
Education	388.1	3.9	32.3	424.3	1.09
Health	127.4	5.0	125.6	258.0	2.03
Recreation, culture and welfare	252.8	8.0	50.5	311.2	1.23
Sanitary services	177.7	3.3	45.7	226.7	1.28
Other retail and community services	172.6	2.5	28.6	203.8	1.18

## **Appendix B. Income Multiplier Relationships (all industrial sectors), Pembrokeshire Coast National Park**

**Table 28: Appendix: Income Multiplier Relationships, Pembrokeshire Coast National Park**

Sector	Incomes created directly	Incomes created indirectly within NP	Incomes created indirectly in rest of Wales	Total income creation	Income Multiplier
Agriculture and fishing	119.3	5.0	59.3	183.7	1.54
Forestry	277.7	10.5	20.7	308.9	1.11
Mining and quarrying	70.9	0.9	36.9	108.8	1.53
Meat processing	9.9	0.2	14.2	24.2	2.44
Dairy products	-	-	-	-	-
Other food products	134.7	2.0	48.6	185.4	1.38
Drinks and tobacco	8.4	0.2	6.9	15.4	1.83
Textiles	184.0	2.1	36.5	222.6	1.21
Clothing and leather products	37.5	0.4	9.7	47.5	1.27
Wood processing and products	145.7	5.0	81.9	232.6	1.60
Paper and paper products	15.2	0.2	39.5	54.8	3.61
Printing and publishing	64.5	0.2	27.2	91.9	1.42
Oil processing	-	-	-	-	-
Chemicals and chemical products	40.4	0.7	55.3	96.4	2.39
Rubber and plastic products	243.6	3.6	98.4	345.5	1.42
Other non-metallic mineral products	177.1	2.5	66.5	246.1	1.39
Metal products	123.4	0.7	191.9	316	2.56
Engineering products	19.7	0.1	57.6	77.4	3.93
Motor vehicles	13.9	0.3	56.9	71	5.11
Other transport equipment	123.7	0.8	152.0	276.6	2.24
Other manufacturing and recycling	121.9	1.5	71.9	195.3	1.60
Electricity	61.8	5.8	58.0	125.5	2.03
Gas	-	-	-	-	-
Water	130.4	1.7	37.4	169.5	1.30
Construction	127.3	2.2	71.1	200.6	1.58
Motor vehicles, sales and repair	199.1	1.1	57.2	257.5	1.29
Wholesale	170.9	1.0	57.2	229.1	1.34
Retail	160.0	1.0	47.2	208.3	1.30
Hotels, bars and restaurants	260.3	1.3	33.0	294.6	1.13
Railways	90.7	0.8	68.9	160.4	1.77
Other land transport	182.2	0.8	42.3	225.3	1.24
Sea and air transport	2.9	0.0	1.6	4.5	1.55
Travel agencies and other transport services	116.6	0.7	63.3	180.5	1.55
Postal services	172.3	0.4	39.8	212.5	1.23
Telecommunications services	33.1	0.2	22.2	55.4	1.67
Financial intermediation and insurance	33.1	0.3	39.0	72.4	2.19
Property	100.8	0.0	0.0	100.8	1.00
Legal and accountancy services	103.7	0.3	33.6	137.7	1.33
Computer and related services	118.2	0.4	26.4	145	1.23
Research and development	241.7	1.6	19.6	262.9	1.09
Other professional business services	140.2	0.6	40.8	181.6	1.30
Public administration	227.7	1.3	84.2	313.1	1.38
Education	423.4	1.2	41.9	466.5	1.10
Health	189.6	3.3	142.0	334.9	1.77
Recreation, culture and welfare	233.2	1.9	72.3	307.4	1.32
Sanitary services	206.4	2.3	59.1	267.8	1.30
Other retail and community services	190.2	0.8	37.3	228.3	1.20

## **Appendix C. Income Multiplier Relationships (all industrial sectors), Snowdonia National Park**

**Table 29: Appendix: Income Multiplier Relationships, Snowdonia National Park**

Sector	Incomes created directly	Incomes created indirectly within NP	Incomes created indirectly in rest of Wales	Total income creation	Income Multiplier
Agriculture and fishing	86.1	2.2	8.4	96.7	1.12
Forestry	75.6	0.2	6.2	82.0	1.08
Mining and quarrying	12.4	1.6	2.9	16.9	1.36
Meat processing	18.6	0.2	4.8	23.7	1.27
Dairy products	57.2	1.3	2.8	61.2	1.07
Other food products	22.3	0.2	3.9	26.4	1.18
Drinks and tobacco	10.2	0.2	0.7	11.1	1.09
Textiles	28.1	0.1	2.2	30.4	1.08
Clothing and leather products	53.4	0.3	0.7	54.5	1.02
Wood processing and products	118.5	2.7	9.6	130.7	1.10
Paper and paper products	3.8	0.0	10.7	14.6	3.84
Printing and publishing	87.3	0.3	2.9	90.5	1.04
Oil processing	90.6	9.2	1.5	101.3	1.12
Chemicals and chemical products	-	-	-	-	-
Rubber and plastic products	153.0	1.1	12.2	166.3	1.09
Other non-metallic mineral products	61.6	0.3	8.8	70.8	1.15
Metal products	39.6	0.2	34.8	74.6	1.88
Engineering products	88.5	0.7	15.1	104.2	1.18
Motor vehicles	3.4	0.0	18.8	22.2	6.53
Other transport equipment	120.8	1.2	18.8	140.8	1.17
Other manufacturing and recycling	35.4	0.3	6.1	41.7	1.18
Electricity	41.8	1.2	12.4	55.5	1.33
Gas	-	-	-	-	-
Water	56.1	0.4	5.1	61.6	1.10
Construction	94.2	1.3	7.8	103.3	1.10
Motor vehicles, sales and repair	132.5	0.6	6.1	139.3	1.05
Wholesale	107.7	1.0	4.9	113.6	1.05
Retail	122.1	0.9	5.4	128.4	1.05
Hotels, bars and restaurants	173.9	1.0	2.5	177.4	1.02
Railways	-	-	-	-	-
Other land transport	180.6	1.5	3.5	185.6	1.03
Sea and air transport	120.0	2.1	0.5	122.6	1.02
Travel agencies and other transport services	120.9	1.1	6.1	128.1	1.06
Postal services	197.1	0.6	3.3	201.0	1.02
Telecommunications services	11.0	0.0	3.5	14.5	1.32
Financial intermediation and insurance	52.1	0.3	8.0	60.4	1.16
Property	98.1	0.1	0.1	98.3	1.00
Legal and accountancy services	122.1	0.4	3.5	126.0	1.03
Computer and related services	71.1	0.2	1.5	72.8	1.02
Research and development	14.2	0.0	1.3	15.5	1.09
Other professional business services	103.0	0.4	3.4	106.8	1.04
Public administration	90.1	0.5	12.1	102.8	1.14
Education	282.3	0.9	4.6	287.8	1.02
Health	94.8	1.2	20.3	116.2	1.23
Recreation, culture and welfare	160.8	1.3	7.9	169.9	1.06
Sanitary services	97.0	0.5	6.8	104.3	1.08
Other retail and community services	158.0	0.8	3.2	162.0	1.03

## **Appendix D. Employment Multiplier Relationships (all industrial sectors), Brecon Beacons National Park**

**Table 30: Appendix: Employment Multiplier Relationships, Brecon Beacons National Park**

Sector	Jobs created directly	Jobs created indirectly within NP	Jobs indirectly in rest of Wales	Total job creation	Employment Multiplier
Agriculture and fishing	10.54	0.95	1.80	13.30	1.26
Forestry	10.40	0.22	1.39	12.00	1.15
Mining and quarrying	4.80	0.04	1.33	6.17	1.29
Meat processing	13.33	0.03	3.99	17.35	1.30
Dairy products	4.66	0.04	2.26	6.96	1.49
Other food products	12.74	0.03	2.73	15.50	1.22
Drinks and tobacco	4.33	0.18	0.50	5.01	1.16
Textiles	11.84	0.03	1.36	13.23	1.12
Clothing and leather products	6.05	0.09	0.66	6.80	1.12
Wood processing and products	8.92	0.49	2.84	12.25	1.37
Paper and paper products	-	-	-	-	-
Printing and publishing	12.86	0.06	2.09	15.01	1.17
Oil processing	-	-	-	-	-
Chemicals and chemical products	7.31	0.08	7.21	14.60	2.00
Rubber and plastic products	12.15	0.08	5.52	17.74	1.46
Other non-metallic mineral products	9.17	0.32	2.74	12.23	1.33
Metal products	4.89	0.06	8.61	13.55	2.77
Engineering products	7.42	0.56	4.48	12.46	1.68
Motor vehicles	9.85	1.55	4.55	15.95	1.62
Other transport equipment	5.56	0.04	7.00	12.60	2.27
Other manufacturing and recycling	14.19	0.06	3.19	17.45	1.23
Electricity	-	-	-	-	-
Gas	-	-	-	-	-
Water	4.23	0.19	1.92	6.34	1.50
Construction	13.29	0.35	3.78	17.42	1.31
Motor vehicles, sales and repair	22.44	0.67	2.53	25.64	1.14
Wholesale	14.78	0.43	3.02	18.23	1.23
Retail	36.21	0.37	3.85	40.43	1.12
Hotels, bars and restaurants	36.06	0.34	1.92	38.32	1.06
Railways	-	-	-	-	-
Other land transport	19.01	0.30	2.16	21.48	1.13
Sea and air transport	14.17	0.02	0.59	14.78	1.04
Travel agencies and other transport services	10.43	0.59	2.56	13.58	1.30
Postal services	24.42	0.03	3.53	27.98	1.15
Telecommunications services	11.11	0.05	2.28	13.44	1.21
Financial intermediation and insurance	8.26	0.22	5.87	14.35	1.74
Property	2.67	0.00	0.08	2.75	1.03
Legal and accountancy services	17.00	0.22	2.25	19.47	1.15
Computer and related services	18.20	0.26	1.23	19.69	1.08
Research and development	20.19	0.32	0.56	21.07	1.04
Other professional business services	27.48	0.30	2.96	30.74	1.12
Public administration	17.09	0.37	5.40	22.87	1.34
Education	31.44	0.40	2.50	34.34	1.09
Health	17.08	0.62	8.71	26.41	1.55
Recreation, culture and welfare	25.55	0.91	4.56	31.02	1.21
Sanitary services	13.25	0.32	3.41	16.98	1.28
Other retail and community services	15.98	0.29	2.37	18.64	1.17

## **Appendix E. Employment Multiplier Relationships (all industrial sectors), Pembrokeshire Coast National Park**

**Table 31: Appendix: Employment Multiplier Relationships, Pembrokeshire Coast National Park**

Sector	Jobs created directly	Jobs created indirectly within NP	Jobs indirectly in rest of Wales	Total job creation	Employment Multiplier
Agriculture and fishing	10.54	0.54	4.36	15.44	1.46
Forestry	10.40	0.72	1.31	12.43	1.20
Mining and quarrying	4.80	0.09	2.63	7.52	1.57
Meat processing	13.33	0.03	1.26	14.62	1.10
Dairy products	-	-	-	-	-
Other food products	12.74	0.22	3.77	16.73	1.31
Drinks and tobacco	4.33	0.02	0.51	4.86	1.12
Textiles	11.84	0.19	2.65	14.68	1.24
Clothing and leather products	6.05	0.03	0.84	6.93	1.14
Wood processing and products	8.92	0.34	4.70	13.96	1.57
Paper and paper products	7.02	0.02	2.33	9.38	1.34
Printing and publishing	12.86	0.03	1.83	14.72	1.14
Oil processing	-	-	-	-	-
Chemicals and chemical products	7.31	0.09	3.15	10.56	1.44
Rubber and plastic products	12.15	0.31	5.24	17.70	1.46
Other non-metallic mineral products	9.17	0.22	3.85	13.23	1.44
Metal products	4.89	0.05	9.06	14.00	2.87
Engineering products	7.42	0.02	2.92	10.35	1.40
Motor vehicles	9.85	0.02	2.82	12.70	1.29
Other transport equipment	5.56	0.07	7.34	12.97	2.33
Other manufacturing and recycling	14.19	0.13	4.21	18.54	1.31
Electricity	1.56	0.39	2.85	4.79	3.07
Gas	-	-	-	-	-
Water	4.23	0.18	2.52	6.93	1.64
Construction	13.29	0.20	4.88	18.38	1.38
Motor vehicles, sales and repair	22.44	0.15	4.28	26.88	1.20
Wholesale	14.78	0.12	4.46	19.35	1.31
Retail	36.21	0.12	4.19	40.52	1.12
Hotels, bars and restaurants	36.06	0.17	2.95	39.19	1.09
Railways	6.79	0.08	4.57	11.44	1.69
Other land transport	19.01	0.10	3.36	22.47	1.18
Sea and air transport	14.17	0.00	0.14	14.31	1.01
Travel agencies and other transport services	10.43	0.08	4.77	15.28	1.46
Postal services	24.42	0.05	3.53	28.00	1.15
Telecommunications services	11.11	0.02	1.49	12.63	1.14
Financial intermediation and insurance	8.26	0.04	3.46	11.76	1.42
Property	2.67	0.00	0.00	2.67	1.00
Legal and accountancy services	17.00	0.05	2.76	19.80	1.16
Computer and related services	18.20	0.07	2.64	20.90	1.15
Research and development	20.19	0.21	1.89	22.30	1.10
Other professional business services	27.48	0.10	4.19	31.76	1.16
Public administration	17.09	0.14	5.46	22.69	1.33
Education	31.44	0.13	3.25	34.82	1.11
Health	17.08	0.33	9.84	27.25	1.60
Recreation, culture and welfare	25.55	0.24	6.53	32.31	1.26
Sanitary services	13.25	0.22	4.40	17.86	1.35
Other retail and community services	15.98	0.11	3.07	19.17	1.20

## **Appendix F. Employment Multiplier Relationships (all industrial sectors), Snowdonia National Park**

**Table 32: Appendix: Employment Multiplier Relationships, Snowdonia National Park**

Sector	Jobs created directly	Jobs created indirectly within NP	Jobs indirectly in rest of Wales	Total job creation	Employment Multiplier
Agriculture and fishing	10.54	0.37	0.67	11.59	1.10
Forestry	10.40	0.03	0.41	10.84	1.04
Mining and quarrying	4.80	0.19	0.18	5.17	1.08
Meat processing	13.33	0.05	0.43	13.81	1.04
Dairy products	4.66	0.15	0.21	5.03	1.08
Other food products	12.74	0.03	0.31	13.08	1.03
Drinks and tobacco	4.33	0.03	0.05	4.42	1.02
Textiles	11.84	0.03	0.16	12.03	1.02
Clothing and leather products	6.05	0.07	0.06	6.19	1.02
Wood processing and products	8.92	0.28	0.56	9.75	1.09
Paper and paper products	7.02	0.00	0.63	7.66	1.09
Printing and publishing	12.86	0.05	0.20	13.10	1.02
Oil processing	1.17	1.99	0.09	3.25	2.79
Chemicals and chemical products	-	-	-	-	-
Rubber and plastic products	12.15	0.16	0.68	12.98	1.07
Other non-metallic mineral products	9.17	0.05	0.53	9.74	1.06
Metal products	4.89	0.03	1.65	6.56	1.34
Engineering products	7.42	0.08	0.77	8.26	1.11
Motor vehicles	9.85	0.00	0.97	10.83	1.10
Other transport equipment	5.56	0.12	0.91	6.59	1.19
Other manufacturing and recycling	14.19	0.05	0.36	14.60	1.03
Electricity	1.56	0.12	0.63	2.31	1.48
Gas	-	-	-	-	-
Water	4.23	0.05	0.36	4.65	1.10
Construction	13.29	0.17	0.54	14.01	1.05
Motor vehicles, sales and repair	22.44	0.10	0.47	23.01	1.03
Wholesale	14.78	0.14	0.39	15.30	1.04
Retail	36.21	0.13	0.48	36.82	1.02
Hotels, bars and restaurants	36.06	0.19	0.23	36.49	1.01
Railways	-	-	-	-	-
Other land transport	19.01	0.18	0.28	19.47	1.02
Sea and air transport	14.17	0.25	0.04	14.46	1.02
Travel agencies and other transport services	10.43	0.14	0.46	11.04	1.06
Postal services	24.42	0.09	0.29	24.81	1.02
Telecommunications services	11.11	0.01	0.23	11.35	1.02
Financial intermediation and insurance	8.26	0.05	0.71	9.02	1.09
Property	2.67	0.01	0.01	2.69	1.01
Legal and accountancy services	17.00	0.06	0.29	17.36	1.02
Computer and related services	18.20	0.04	0.15	18.39	1.01
Research and development	20.19	0.00	0.14	20.33	1.01
Other professional business services	27.48	0.08	0.36	27.91	1.02
Public administration	17.09	0.07	0.80	17.96	1.05
Education	31.44	0.13	0.36	31.94	1.02
Health	17.08	0.21	1.44	18.73	1.10
Recreation, culture and welfare	25.55	0.23	0.73	26.50	1.04
Sanitary services	13.25	0.08	0.51	13.84	1.04
Other retail and community services	15.98	0.14	0.27	16.40	1.03

**Appendix G. Input-output Model of the Welsh National Parks**

Sector	BBNP			PCNP			SNP		
	Output Multiplier	% Intra-regional	% Inter-regional	Output Multiplier	% Intra-regional	% Inter-regional	Output Multiplier	% Intra-regional	% Inter-regional
1 Agriculture and fishing	1.238	35%	65%	1.421	11%	89%	1.09	36%	64%
2. Forestry	1.135	13%	87%	1.17	35%	65%	1.037	7%	93%
3. Mining and quarrying	1.148	3%	97%	1.297	3%	97%	1.041	53%	47%
4. Meat processing	1.335	1%	99%	1.107	2%	98%	1.04	11%	89%
5. Dairy products	1.22	2%	98%	-	-	-	1.035	44%	56%
6. Other food products	1.232	1%	99%	1.334	6%	94%	1.029	8%	92%
7. Drinks and tobacco	1.054	26%	74%	1.042	3%	97%	1.007	39%	61%
8. Textiles	1.122	2%	98%	1.249	7%	93%	1.017	14%	86%
9. Clothing and leather products	1.064	12%	88%	1.075	4%	96%	1.012	54%	46%
10. Wood processing and products	1.33	15%	85%	1.499	7%	93%	1.083	34%	66%
11. Paper and paper products	1.552	0%	100%	1.255	1%	99%	1.069	1%	99%
12. Printing and publishing	1.188	3%	97%	1.162	2%	98%	1.021	19%	81%
13. Oil processing	1.207	0%	100%	-	-	-	1.329	97%	3%
14. Chemicals and chemical products	1.708	1%	99%	1.315	3%	97%	1.107	1%	99%
15. Rubber and plastic products	1.55	1%	99%	1.546	6%	94%	1.082	19%	81%
16. Other non-metallic mineral products	1.313	11%	89%	1.415	5%	95%	1.059	8%	92%

Sector	BBNP			PCNP			SNP		
	Output Multiplier	% Intra-regional	% Inter-regional	Output Multiplier	% Intra-regional	% Inter-regional	Output Multiplier	% Intra-regional	% Inter-regional
17. Metal products	2.029	1%	99%	2.083	1%	99%	1.199	2%	98%
18. Engineering products	1.525	11%	89%	1.305	1%	99%	1.088	9%	91%
19. Motor vehicles	1.661	26%	74%	1.307	1%	99%	1.106	1%	99%
20. Other transport equipment	1.754	1%	99%	1.794	1%	99%	1.112	12%	88%
21 Other manufacturing and recycling	1.315	2%	98%	1.42	3%	97%	1.039	11%	89%
22. Electricity	1.832	0%	100%	1.685	15%	85%	1.163	18%	82%
23. Gas	1.324	0%	100%	-	-	-	1.036	0%	100%
24. Water	1.193	9%	91%	1.246	7%	93%	1.038	12%	88%
25. Construction	1.355	8%	92%	1.438	4%	96%	1.062	24%	76%
26. Motor vehicles, sales and repair	1.24	20%	80%	1.332	3%	97%	1.042	17%	83%
27. Wholesale	1.25	12%	88%	1.331	3%	97%	1.038	26%	74%
28. Retail	1.298	9%	91%	1.305	3%	97%	1.043	21%	79%
29. Hotels, bars and restaurants	1.177	15%	85%	1.245	5%	95%	1.033	45%	55%
30. Railways	1.339	0%	100%	1.403	2%	98%	1.039	0%	100%
31. Other land transport	1.206	12%	88%	1.288	3%	97%	1.039	40%	60%
32. Sea and air transport	1.049	3%	97%	1.012	1%	99%	1.024	87%	13%
33. Travel agencies and other transport services	1.231	19%	81%	1.356	2%	98%	1.045	24%	76%
34. Postal services	1.224	1%	99%	1.225	1%	99%	1.024	23%	77%
35. Telecommunications services	1.192	2%	98%	1.125	2%	98%	1.02	3%	97%
36. Financial intermediation and insurance	1.37	3%	97%	1.212	1%	99%	1.046	7%	93%

Sector	BBNP			PCNP			SNP		
	Output Multiplier	% Intra-regional	% Inter-regional	Output Multiplier	% Intra-regional	% Inter-regional	Output Multiplier	% Intra-regional	% Inter-regional
37. Property	1.005	1%	99%	-	-	-	1.001	46%	54%
38. Legal and accountancy services	1.142	8%	92%	1.161	2%	98%	1.02	17%	83%
39. Computer and related services	1.075	17%	83%	1.136	2%	98%	1.01	20%	80%
40. Research and development	1.044	34%	66%	1.105	10%	90%	1.007	1%	99%
41. Other professional business services	1.159	9%	91%	1.21	2%	98%	1.021	18%	82%
42. Public administration	1.459	6%	94%	1.445	2%	98%	1.069	8%	92%
43. Education	1.184	13%	87%	1.215	4%	96%	1.031	26%	74%
44. Health	1.63	6%	94%	1.686	3%	97%	1.111	13%	87%
45. Recreation, culture and welfare	1.269	16%	84%	1.334	3%	97%	1.047	23%	77%
46. Sanitary services	1.257	8%	92%	1.317	5%	95%	1.041	13%	87%
47. Other retail and community services	1.166	11%	89%	1.199	3%	97%	1.026	34%	66%
<b>average</b>	<b>1.31</b>	<b>9%</b>	<b>91%</b>	<b>1.32</b>	<b>4%</b>	<b>96%</b>	<b>1.06</b>	<b>22%</b>	<b>78%</b>

## **Appendix H. VoE Interview Questionnaire**

### **Introduction**

The original VoE report comments on the quality of the environment as a key strength and a major asset of the country. It cites as evidence, among others, the range and coverage of international and national landscape, nature conservation and built heritage designations in the region.

The environment is appreciated for its intrinsic appeal and contribution to quality of life. Economists have long been able to estimate values for these non-market goods. However, while these estimates offer insight into the scale and location of appreciation they are not closely linked to the other conventionally employed economic measures such as GDP, nor do they take into account the input of the environment to the economy.

The original *Valuing our Environment* study, whilst acknowledging the problems of GDP, which does not account for social and environmental externalities, and the existence of measures which do (such as ISEW; see Midmore & Whittaker 2000; Munday *et al.*, 2002) employed the conventional measures in an assessment of the economic contribution of the environment. Both the direct and induced effects on employment, output, GDP and income to labour were estimated using the 1996 Welsh Input-Output Tables and, largely, secondary data sourced from appropriate organisations.

Those appropriate organisations were identified in the VoE framework through the adoption of three categories based on their relationship with the environment:

- Activities concerned with the protection and enhancement of the environment
- Activities that make intensive use of one or more elements of the environment as a primary resource
- Activities which are dependant on the quality of the environment.

The contribution of the environment to the economy was found to be substantial; 1 in 6 of Welsh jobs and around 9% GDP are linked to the environment.

### **Questions**

1. Name
2. Contact details (e-mail/phone)
3. Your organization/company
4. Position in organisation
5. Role/duties.....  
.....

.....  
.....

6. Aims/objective of your organisation generally

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.....  
.....  
.....

7. Aims/objectives of your organisation in the National Parks in particular

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.....  
.....

8. Does your organisation differentiate between its functions within and outside of the National Parks in any ways, for example budget, staff and other resources? Are these differences formal? Does your organisation cooperate with others differently in the National Parks?

9. Do you have any details of these issues? (Either quantities or % would be helpful)

	<b>Environmental role</b>	<b>Total</b>	<b>In National Park</b>
Employees	Protecting and enhancing (e.g. conservation work)		
	Intensive use as a primary resource (e.g. farming, mining)		
	Dependant on quality (e.g. tourism)		
Budget	Protecting and enhancing (e.g. conservation work)		
	Intensive use as a primary resource (e.g. farming, mining)		
	Dependant on quality (e.g. tourism)		
Other resources (please identify)	Protecting and enhancing (e.g. conservation work)		
	Intensive use as a primary resource (e.g. farming, mining)		
	Dependant on quality (e.g. tourism)		

10. Any other details or information to add to Q9

11. *You may want to complete this question following our discussion.* How does your organisation measure success? What are the criteria? How do these relate to conventional measures such as GDP?

**Appendix I. Average Income per Employee by Sector**

	<b>Sector</b>	<b>Av. Income per employee (£'000)</b>
s1	Agriculture and fishing	14,177
s2	Forestry	39,858
s3	Mining and quarrying	45,330
s4	Meat processing	14,515
s5	Dairy products	31,945
s6	Other food products	20,026
s7	Drinks and tobacco	35,407
s8	Textiles	28,650
s9	Clothing and leather products	53,467
s10	Wood processing and products	25,641
s11	Paper and paper products	26,443
s12	Printing and publishing	27,191
s13	Oil processing	76,506
s14	Chemicals and chemical products	30,619
s15	Rubber and plastic products	26,574
s16	Other non-metallic mineral products	30,729
s17	Metal products	48,472
s18	Engineering products	34,003
s19	Motor vehicles	18,320
s20	Other transport equipment	44,598
s21	Other manufacturing and recycling	17,498
s22	Electricity	52,673
s23	Gas	111,435
s24	Water	43,031
s25	Construction	16,030
s26	Motor vehicles, sales and repair	15,726
s27	Wholesale	20,278
s28	Retail	8,167
s29	Hotels, bars and restaurants	9,469
s30	Railways	35,466
s31	Other land transport	19,946
s32	Sea and air transport	16,281
s33	Travel agencies and other transport services	26,680
s34	Postal services	20,691
s35	Telecommunications services	23,024
s36	Financial intermediation and insurance	26,356
s37	Property	34,018
s38	Legal and accountancy services	20,604
s39	Computer and related services	21,424
s40	Research and development	20,087

	<b>Sector</b>	<b>Av. Income per employee (£'000)</b>
<b>Table continues overleaf</b>		
s41	Other professional business services	14,300
s42	Public administration	25,454
s43	Education	20,967
s44	Health	16,620
s45	Recreation, culture and welfare	14,861
s46	Sanitary services	25,051
s47	Other retail and community services	25,420

## **Appendix J. Interviewees**

Arthog Outdoor Education Centre; Snowdonia National Park  
Bay View Hotel; Pembrokeshire Coast National Park  
Cantref Riding Centre; Brecon Beacons National Park  
Cottage Rental Agent; Pembrokeshire Coast National Park  
Craig-y-dderwen Hotel and Restaurant; Snowdonia National Park  
Crickhowell Newsagent and Post Office; Brecon Beacons National Park  
Dee Reynolds; Tourism Partnership Mid Wales  
Dewi Davies, Tourism Partnership North Wales  
Fishguard Newsagent; Pembrokeshire Coast National Park  
G Davies (Butchers); Pembrokeshire Coast National Park  
Glyndwr Hotel; Snowdonia National Park  
J. Arnold; shop owner (newsagent, fishing tackle, convenience store, toy shop) Snowdonia National Park  
Llangors Riding and Rope Centre; Brecon Beacons National Park  
Mace Stores; Pembrokeshire Coast National Park  
Michel Regelous; Pembrokeshire Coast National Park Authority  
Newsagent and Giftshop; Snowdonia National Park  
Non-profit residential activity centre; Snowdonia National Park  
St Brides Inn; Pembrokeshire Coast National Park  
Talybont on Usk Stores; Brecon Beacons National Park  
The Old Ford Inn; Brecon Beacons National Park  
White House Inn, Sennybridge  
Peter Tyldesley; Beacons National Park  
Cath Ranson; Snowdonia National Park  
Erica Fielding; Pembrokeshire Coast National Park  
Gwynedd Watkins; Farmers Union of Wales  
Daffydd Jarredd; National Farmers Union  
Gary Davies; Tourism Partnership South Wales  
Tracy Nettleton; Brecon Beacons National Park  
Tim Johns, Farmer  
Rebecca Williams; Farmers Union of Wales, Haverfordwest

### **Dolgellau and Machynlleth Case Study**

Interviews with various businesses in the towns (replicating the types of business in each town) including:

Newsagent, Ladies Fashion Store, Gift Shop, Outdoor Clothing/Camping, Butcher, Cycle shop, Gifts, Antiques, Coffee shop, Fruit and Vegetable store, Public House, Supermarket, bed and breakfast and various tourist attractions such as the Corris Craft Centre.