

BRECON BEACONS NATIONAL PARK

Visitors and Visitor Pressure in the Brecon Beacons National Park

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SCOPE: Tourism and effects of pressure from tourism.
The Brecon Beacons National Park as a venue for tourists.
Visitor patterns – Brecon Beacons National Park.

RANGE: GCSE/A Level

TOURISM AND ITS IMPACT IN THE BRECON BEACONS NATIONAL PARK

THE BACKGROUND

Brecon Beacons Landscape, Structure and Weather

The National Parks, together with the Broads of Norfolk and Suffolk, contain the most beautiful and dramatic expanses of countryside in England and Wales and cover around ten per cent of the land area. The Brecon Beacons National Park (BBNP) lies across parts of nine Unitary Authorities, with two-thirds of its area in Powys.

The Brecon Beacons form the northern rim of the South Wales coalfields and from their summits the view extends southwards down heavily populated valleys towards the cities and towns on the Bristol Channel. About 2 million people live in South Wales, within an hour's drive of the Park. To the north and west, in complete contrast, lie the farmed uplands of Mid Wales, with small towns and a sparse rural population. In the east, the Park boundary follows the English border beyond which lie the rich agricultural lowlands of Herefordshire.

In the wider context, the large urban populations of the West Midlands are only about 2 hours driving time away, Bristol 1 hour and London about 3 hours, via the M4. The Beacons are the mountains closest to south-east England. Communications with and within the Park are entirely by road, for despite the proximity of three railway lines there are no stations within the Park. Major roads run through the Park from Swansea, Cardiff and Newport, including the A470, Wales's main north-south link. The A40 traverses the Park from east to west, carrying heavy vehicles and holiday makers to West Wales and the Irish ferries, in parallel with the M4. The Heads of the Valleys road runs along the southern fringes of the Park.

The Park is dominated by a north-facing escarpment of Old Red Sandstone, running from the Carmarthenshire Black Mountain eastwards through Fforest Fawr and the Beacons to the eastern Black Mountains, broken only by the Usk Valley. Pen-y-Fan is the highest point at 886m. The cliffs and steep slopes of the scarp with their horizontal rock bands support Britain's southernmost remnants of arctic-alpine flora, and nest sites for ravens and peregrine falcons.

Each mountain block has its individual character, with differing combinations of steep scarps, whale-backed or sharp ridges and sweeping or gentle slopes. Many valleys show typical features of glaciation. Some areas are blanketed with a thick layer of peat, heavily eroded in places, and elsewhere soils are mainly acidic and peaty. The vegetation, varying with soils, drainage and the extent of grazing, includes bogs and communities of heather, bilberry and gorse, fescue and purple moorgrass. Bracken has invaded some lower slopes and regeneration of trees and shrubs is limited, except on cliffs inaccessible to stock. Birds of the moorlands include snipe and wheatear, meadow pipit, skylark and merlin. The majority of the hill land in the Park is given over to Common grazings: the total flock size of the sheep in the Park is approaching one million. Several valleys contain reservoirs supplying water to South Wales and some of these reservoirs are used for fishing and as wildlife sites. Some of the valleys and plateaux have been planted with coniferous forests, which have a striking effect on the Park's landscape. They provide different habitats at different stages in their growth, so some support more wildlife than open moorland. However, they are unlikely to be as diverse as the broad-leaved woodlands they may have replaced.

South of the sandstone moorlands runs a belt of Carboniferous Limestone and Millstone Grit, itself forming a prominent escarpment in the west and above the Usk valley near Crickhowell. The limestone area is notable for its cave systems, with disappearing streams and surface shakeholes. The Park's most spectacular waterfalls have developed in gorges in the Millstone Grit near Ystradfellte. Limestone grassland is rich in herb species, while in the ash woodlands and on inaccessible slopes some rare indigenous species of whitebeam are found. On the southern fringe of the Park, Coal Measures outcrop in a few places, affecting the landscape where there have been workings.

A setting for the wilder uplands is provided by the farmed valleys and lowlands of the Park, with their attractive patchwork of fields, hedgerows and scattered farms and villages. Woodlands occupy an important place, often prominent on steep valley sides. Sessile oak is the dominant tree species and some woods contain a rich diversity of plant and animal life. The birds and animals of field and hedgerow include woodland species which have successfully adapted to this man-made habitat; old hay meadows and marshes contain a colourful variety of plants, sometimes including scarce species such as the globe flower. The buzzard is a common bird of prey of the valleys and farms, and the rare red kite is gradually extending its range in the Park.

The Usk is the chief river of the Park, rising beneath Bannau Brycheiniog and flowing eastwards to cut across the mountain chain. Many of the main rivers of South Wales (such as the Tawe, Nedd and Taff) rise in the Park. The north-east of the Park is drained by the Wye and the west by the Tywi. There is a wide variety of river scenery, and wildlife includes salmon, trout, dippers, kingfishers and otters. There are several glacial lakes at high altitude. Llangors Lake supports a rich flora and fauna; coot, great crested grebes and reed warblers nest there, and in winter it is visited by various species of duck. The reedbeds around the lake provide a roost for thousands of starlings.

Man-made features are also part of the Park's character, the legacy of many periods of history. There are prehistoric cairns, standing stones and traces of dwellings, Iron Age hill-forts, Roman camps and roads, Dark Age inscribed stones, Norman castles, medieval churches, domestic buildings from Tudor times onwards, scattered farms and historic towns. Relics of the industrial revolution include mines, quarries and ironworks which were once served by tramways, many linking with the Monmouthshire and Brecon Canal.

All these elements contribute to the beauty of the Park. They are constantly affected by change; over long periods as the climate changes or over a very short time as economic policies affect land use. The National Park Authority has a duty to conserve for the future the Park's natural beauty, wildlife and cultural heritage and the special qualities which make it so attractive to live in and to visit.

The Brecon Beacons National Park, in common with much of Western Britain, experiences a maritime climate due to its proximity to the Atlantic Ocean and the warm North Atlantic Drift. The National Park area, because of the inflow of warm, moist air frequently has moderate to high rainfall, variable cloudiness and hillfog. The Park is often subjected to winds of moderate speed.

There is some variation in weather and climate from west to east of the Park (a distance of some 80km), though hardly any variation from north to south (24-48km). The Park's varied topography with its exposed and sheltered areas, and most of all its 'altitude', accounts for the differences in climate over the Park. Temperature, humidity, rainfall, snowfall, cloudiness, sunshine, wind and wind-chill, visibility and frost incidence – are all strongly modified by altitude.

Rainfall has a major influence on the flora and fauna of the Park. Rainfall also affects the experience of visitors and the enjoyment of outdoor activities. The correlation between rainfall and location is apparent, with annual average totals of over 2600mm on the western end of the Black Mountain, over 2400mm on Fforest Fawr and the Brecon Beacon, but only 1500mm on the Black Mountains.

Past and present climates have profoundly affected (and still are affecting) the landscapes of the Park. Glaciation sculpted the land surface and rainfall has been a major factor in peat formation and drainage patterns.

Brecon Beacons National Park Land Ownership / Access Dimensions

The National Park Authority owns about 14.5% of the land within the National Park – this amounts to approximately 19,700 hectares. The land owned by other public bodies include 7.0% by Forest Enterprise, 4.2% by Welsh Water, 4.0% by the National Trust and 0.8% by the Countryside Council for Wales. Some 70% of the land within the Park is privately owned.

Commons make up to 36% of the National Park. It is incorrect to think that common land is either truly natural or an ownerless waste. All land is owned by someone and the vegetation has been profoundly affected by human activity (for instance, running large numbers of grazing animals on the moorland). Today, ownership carries few economic advantages (but important responsibilities) while specified uses are shared by those who have legally registered rights “in common”. Usually these rights are attached to farms which surround the common, and the most important are for grazing sheep, ponies or cattle. There are about 1200 farms within the Park. Sheep farming is by far the most significant activity and it is estimated that the total flock size is 974,000 (sheep and lambs).

Our public rights of way system, the envy of many other countries, provides easy access for people to enjoy the countryside. All public rights of way are public highways in law. Any member of the public may use a right of way, and may do so at any time, just as they would any other kind of highway. The user is obliged to stay on the line of the right of way and observe the regulations relating to that right of way. People should not be intimidated or prevented from using a right of way. However, a right of way only gives a ‘right of passage’ to travel across land. It does not entitle people to roam at will over the land, or to use the land (or right of way) for other purposes. Rights of way are normally just simple paths and tracks, for instance across farm land, through a wood or beside a stream.

Types of rights of way: How a right of way can be used depends on what kind of highway it is.

- If the highway is a **footpath** it may be used only by pedestrians.
- If the highway is a **bridleway** it may be used for riding or leading a horse (donkey or mule), as well as by pedestrians. The law does not make clear whether there is a right to drive animals on a bridleway. Pedal cycling is permitted, providing cyclists give way to riders and pedestrians. Driving a vehicle is not permitted, even if it is horse-drawn.
- A **byway open to all traffic** (often referred to simply as a byway) is a highway that is used by the public mainly for walking or riding horses, but over which there is also a right to use any kind of wheeled vehicle – whether it is a horse-drawn vehicle or motor vehicle.

Some highways are still recorded as **roads used as public paths** or RUPPs. Determining exactly what rights exist over these can be difficult. RUPPs are to be re-classified but this is a long and slow process. You do at least have the same rights on a RUPP as you have on a bridleway, although there may be legal uncertainty – or local dispute – about whether a particular RUPP can be used by vehicles. The term **Green Lane** has no legal meaning. Any public right of way along a green lane will usually fall into one of the above categories. **Permitted paths** are where a landowner is willing to allow use of other paths and tracks over his land that are not public rights of way. There is no statutory right of use, and they are used with the permission of the owner.

County Councils are required by law to maintain a definitive map on which all public rights of way, showing whether each is a footpath, a bridleway, a byway or a RUPP, is recorded. The National Park Authority has delegated responsibilities for rights of way from constituent counties and maintains definitive maps on their behalf.

Landowners and occupiers have certain responsibilities for public rights of way; this is generally limited to respecting the public’s right of passage and doing nothing that would inconvenience or endanger the public in any way. Nearly all rights of way are ‘maintainable at public expense’, and their maintenance is the duty of the highway authority. To allow them to carry this out, the surface is treated as being owned by the highway authority. It is normally the landowner’s or occupier’s duty to

maintain gates and stiles in a safe condition. Many authorities now provide free material in the form of a stile or gate kit which the landowner or occupier can then install. The Brecon Beacons National Park has taken on responsibility for maintenance of rights of way in the Park and generally maintains stiles and gates.

In addition to public rights of way, the Countryside and Rights of Way Act (CROW) gives the public a right of access on foot to land mapped as 'Access Land' by CCW. Access land is registered common land and open country (mountain, moor, heath or down). The public also have a right to picnic, climb, bird watch, etc on access land. Some temporary restrictions may apply to allow land management operations to proceed on for Health and Safety reasons (see CCW website for details).

The National Trust owns 3,750 hectares of the central massif of the Brecon Beacons and also has land on the Skirrid and part of the Sugar Loaf. The National Trust take on some responsibility for upkeep of paths, gates and stiles on their land, largely those not on public rights of way.

TOURISM

Visitors to the National Parks:

(Visitors to the National Parks – Summary of the 1994 survey findings. Countryside Commission, 1996.)

A visitor's survey was carried out in 1994 to gather information on the types of tourists that visited the National Parks, Broads and New Forest and to obtain details of their stay. Six key questions were asked:

1. Who visits the Park?

In the Parks overall, six out of ten visitor days were by people on holiday in the area, two-thirds of whom were actually staying within the Park boundaries. The Brecon Beacons and the Peak District National Parks were the only two parks that received more visits by day trippers than by holidaymakers.

Type of visitor to National Parks, the Broads and the New Forest (% of respondents).

| | |
|-----|--|
| 40% | Holiday visitor days made by people staying inside the Park |
| 39% | Day visitor days |
| 21% | Holiday visitor days made by people staying outside the Park |

Source: Visitors to the National Parks – Summary of the 1994 survey findings. Countryside Commission, 1996.

Only 5% of visitors to the parks were made by individuals travelling on their own, and a similar proportion was made by organised groups. The vast majority of visits were undertaken by small groups of friends and family – of these, over half were couples without children.

Composition of visitors (% of respondents).

| | |
|-----|-----------------------------|
| 68% | Family Group |
| 15% | Group of Friends |
| 7% | Group of Family and Friends |
| 5% | Organised Group |
| 5% | Person on own |

Source: Visitors to the National Parks – Summary of the 1994 survey findings. Countryside Commission, 1996.

Almost all **day visitors** (94%) had been to the same Park before. Over half visited once a month in the summer. 73% of **holidaymakers** had been to the same Park on previous holidays.

2. Where do they come from?

Day visitors to Parks mainly come from the towns, districts and counties immediately surrounding them. For most Parks, the main regions that **holidaymakers** came from were: the South East of England, reflecting its sizeable population, and the region nearest to the Park in question, suggesting that many **holidaymakers** travel quite short distances to stay overnight in their 'local' Park. Only 7% of **holiday visitors** days were accounted for by overseas visitors, mainly from Germany, the Netherlands, USA and Australia.

3. How do they get to the Parks?

91% of visitors came to the Parks by car, van or camper, whereas only 6% travelled there by public transport.

4. Why do visitors come to the Parks?

The survey found that 58% of people were motivated to visit Parks for the scenery and landscape, followed by peace and quiet (29%). These aspects are part of the distinctive appeal of the National Parks and the two qualities for which they were established. Some parks were clearly attractive to

some visitors because of their ease of access. This was more important in the Parks which are close to major centres of population. 'Easy to get to' was given as a reason by 33% of visitors to the Peak District National Park, 23% of visitors to the New Forest and 20% of visitors to the Brecon Beacons National Park.

5. What activities do they participate in?

Day trip visitors and **holidaymakers** came to the Parks for a variety of reasons.

Activities (% of respondents)

The main purposes of **day trips** were:

| | |
|--------------------------------|-----|
| Walking | 40% |
| Driving/Relaxing | 32% |
| Visiting a specific attraction | 16% |
| Outdoor sport/special interest | 8% |
| Other | 4% |

The main purposes of **holidaymakers** visits were:

| | |
|--|-----|
| Moderate activities (eg. fishing) | 31% |
| Driving/sightseeing | 27% |
| Active pursuits (eg. walking/climbing) | 22% |
| Quiet relaxation | 15% |
| Other | 4% |

Source: Visitors to the National Parks – Summary of the 1994 survey findings. Countryside Commission, 1996.

The average **day visit** to a Park lasted just four hours. **Holiday stays** in Parks averaged just under six nights, however 17% of **holidaymakers** stayed for 8 nights or more. 73% of **holidaymakers** and 43% of **day visitors** used information to plan their trip. 42% of **holidaymakers** and 38% of **day visitors** used Ordnance Survey maps to plan their visit. Only 16% of **holidaymakers** said that they had used a National Park Information Centre to plan their visits.

6. Did people enjoy their visit?

The scenic appeal of the Parks was the main source of visitor enjoyment, 80% of visitors said that scenery and landscape was very important, followed by the fresh, clean air (68%), peace and quiet (59%) and the lack of crowds (57%). Good walking, and wildlife/ plantlife were also very important. Specific facilities were considered to be less important to the visitors' enjoyment.

Over 80% of visitors had no complaints about their experience. Of those that did complain, the main problems encountered were with traffic outside the Park. Other complaints mentioned were dirty or inadequate facilities (14%) and insufficient signs (14%). Overall, only 12% of people said that there were too many people in the Parks: the Lake District was considered worst in this regard.

Most facilities and services were considered 'good' or 'adequate' by 90% of visitors who used them. Public transport was the exception to this, being considered 'poor' by a quarter of users.

Spending

The survey revealed that the average daily expenditure per head was:

- £6.90 in the case of **day visitors**
- £8.80 in the case of **holidaymakers** staying outside the Park
- £13.50 in the case of **holidaymakers** staying in the Park

Holidaymakers spent more than **day visitors** on all items – especially on shopping.

Visitors to the Brecon Beacons National Park:

The estimated total number of visitor days spent in the Brecon Beacons National Park in 1994 was 3.6 million. There were an estimated 3.3 million visitor days by private transport (eg. car, motorcycle, cycle, private mini-bus) from outside the Park. Some 1.7 million were day visits from home and 1.6 million were holiday days spent by people staying either inside or outside the Brecon Beacons National Park. An estimated 135,000 visitor days made to the National Park were via public transport or organised private coach.

1. Who visits the Brecon Beacons National Park?

53% of visits to the Brecon Beacons National Park were made up of day visitor days from home, 30% of holiday visitor days by people staying outside the Park, and 17% of holiday visitor days by people staying inside the Park. 61% of visitors were in family groups. The commonest group structure was two adults aged less than 60 years. 8% of visitors were in organised groups.

Group size – Visitors to the Brecon Beacons National Park

| <u>Number in group</u> | <u>% of visitors</u> |
|------------------------|----------------------|
| 1 | 5 |
| 2 | 43 |
| 3 | 16 |
| 4 | 20 |
| 5 | 6 |
| 6 plus | 11 |

Source: 1994 All Parks Visitor Survey – Report of the survey in the Brecon Beacons National Park – Volume 12, Final Report (Centre for Leisure Research and JMP Consultants Ltd, 1995)

2. Where do they come from?

EXCLUDING RESIDENTS of the National Park, 61% of people on **day trips** came from within easy travelling distance to the Park.

22% came from the former Gwent area

16% came from the former Mid Glamorgan area

9% came from the Hereford and Worcester area

7% came from the former West Glamorgan area.

The other 39% of people on day trips came from further afield.

17% from further afield in Wales

13% from the south west of England

3% from the Midlands

3% from London and the South East.

Source: 1994 All Parks Visitor Survey – Report of the survey in the Brecon Beacons National Park – Volume 12, Final Report (Centre for Leisure Research and JMP Consultants Ltd, 1995)

Holiday visitors came from across the United Kingdom and 13% came from overseas – (the Brecon Beacons National Park is a popular stop for foreign tourists on their way to Pembrokeshire). Around a third (32%) of holiday visitors came from the South East and Greater London Regions, 15% from the South West Region and 10% from Wales.

An average of 88% **day trip visitors** had been to the Brecon Beacons National Park before, while 56% of **holidaymakers** had previously visited the BBNP on holiday.

84% of **day trip visitors** had previously visited the Park during the past two years.

It was found that:

13% of day trip visitors came more than once per week

11% of day trip visitors came once a week

13% of day trip visitors came once a fortnight

19% of day trip visitors came once a month

25% of day trip visitors came less than monthly but more than once in summer.

89% of **day trip visitors** said that they would definitely visit the Park again and a further 10% said that they would probably return.

It was noted that on average 44% of **holiday visitors** had spent a short break or holiday in the Brecon Beacons National Park over the previous 5 years. In fact, 18% of those questioned had made over 10 holiday visits to the Park in the previous 5 years. 53% of **holiday visitors** said that they would definitely have another holiday in the Park and a further 30% said that they would probably have another holiday there.

Source: 1994 All Parks Visitor Survey – Report of the survey in the Brecon Beacons National Park – Volume 12, Final Report (Centre for Leisure Research and JMP Consultants Ltd, 1995)

3. How do they get to the Brecon Beacons National Park?

The vast majority of people (93%) travelled to the BBNP in their own private vehicles. Only 4% came by private coach and just 3% by minibus.

4. Why do visitors come to the Brecon Beacons National Park?

The landscape/scenery was the reason most frequently cited for visiting the BBNP (by 61% of all respondents). Over a quarter (28%) of respondents said that they were visiting the BBNP because they had 'enjoyed a previous visit' and a similar proportion (27%) said that they were attracted to the area by the 'peace and quiet'.

Reasons for visiting the Brecon Beacons National Park

The SINGLE MOST IMPORTANT reason for choosing to visit the Brecon Beacons National Park were cited as:

| | |
|-------------------------------|-----|
| Landscape/Scenery | 30% |
| Previous enjoyable visit | 12% |
| Special activity/event | 9% |
| Take part in outdoor activity | 9% |
| New area to visit | 8% |
| Peace and quiet | 7% |
| Easy to get to | 5% |
| Family/Friends in Park | 3% |
| Come every year | 2% |
| Recommended to visit | 2% |
| Because it is a National Park | 1% |
| Own accommodation in area | 1% |
| Other | 11% |

Source: 1994 All Parks Visitor Survey – Report of the survey in the Brecon Beacons National Park – Volume 12, Final Report (Centre for Leisure Research and JMP Consultants Ltd, 1995)

5. What activities do they participate in?

For **day trip visitors**, walking was the most frequently mentioned purpose for the visit. 21% said they had come for a short walk (up to two hours), 13% for a longer walk (over two hours). 16% visited a tourist/historic attraction, 15% drove around and enjoyed views from the car, 15% sat and relaxed, 9% visited a town or specific place, 4% pursued a hobby or special interest. Under 1% of day visitors came to take part in motorsports or watersports and just 3% in other outdoor sports.

32% of **holidaymakers** described their visit as a 'moderately active' holiday (this included going for short walks and/or cycling). 21% were on an 'active' holiday with most of their time spent in activities such as hill/fell walking, mountain biking, etc. 27% of holidaymakers drove around and

visited places and 13% of holidaymakers actually stayed in one place for most of their holiday for quiet relaxation.

6. Which aspect did people say contributed most to the enjoyment of their visit?

The landscape/scenery was cited as the most important aspect of their enjoyment (81% very important; 19% important), with 'fresh, clean air' a close second (77% very important; 22% important). 'Peace and quiet' was also valued (70% very important; 27% important), as was the Park being 'not too crowded' (56% very important; 41% important).

7. How long do they stay in the Park?

Over half (52%) of the **day trip visitors** stayed in the Park for 3 hours or more. 14% spent at least 6 hours in the Park. The average length of stay for **day trip visitors** was 3.3 hours. Of those people visiting the Brecon Beacons National Park as part of a **holiday**, some 40% stayed in the National Park. Of these, the average number of nights they stayed in the National Park was 4.5. Over half the **holidaymakers** staying in the Brecon Beacons National Park were self-catering.

8. How much do they spend?

72% of all visitors spent some money in and around the National Park. Excluding accommodation costs, **holidaymakers** staying inside the Park spent on average £9.70 per person per day; **holidaymakers** staying outside the Park spent £5.80 per person and **day trip visitors** spent £6.20 per person.

The data presented from the All Park Visitor Survey was collected and collated in 1994. Ideally such a study should be carried out every five years or so.

PROBLEMS WITH EROSION

Erosion is not a recent phenomenon. As long ago as 1819, a Lakeland traveller arriving at a hostelry in Langdale complained that the route he had travelled was seriously eroded and in a worse condition than when he had travelled there ten years previously. As outdoor pursuits grow as a recreational pastime so will the impact upon our environment.

Walkers affect path erosion in two ways. Firstly, the soles of walking boots which give a good grip on almost all terrain rip up the vegetation and churn up the top soil, resulting in areas that are more exposed to weathering. Secondly, walkers compact the top soil reducing the pore space and therefore the soil's ability to absorb water is greatly reduced. As mentioned earlier, the Park area receives a high rainfall: rain exacerbates the problem of footpath erosion once the initial impact of walkers has started. Rain water either remains in a puddle in the middle of paths, causing walkers to move to the left or the right; or when heavy enough and/or the gradient of the slope is steep enough, washes down the path. This flow strips away the top soil dislodging any remaining vegetation and revealing boulders in the sub soil. This is known as 'gullying'. Once the gullying process has begun, it is very hard to prevent as the gullies provide a natural downhill course for rain water. The boulders exposed by gullying are uncomfortable to walk on. Once again walkers move to the left and the right creating an ever increasing path width.

Upland areas are generally susceptible to erosion through heavy use by walkers. The vegetation grows slowly due to climatic factors and in the Brecon Beacons National Park and other upland areas vegetation is grazed by sheep, keeping it short. Where there has been an increase in use by walkers there has been a corresponding impact on paths; their width has increased and there has been an increase in the number of additional tracks across upland areas. Vegetation is given little time to recover in the winter seasons due to the harsh climate and poor upland soils and increasing use during winter months. The problems can be exacerbated through grazing pressure on the vegetative cover.

A combination of physical factors largely controls the rate and the extent of path erosion – foot pressure can be seen as the catalyst in the process. The various types of soils in the Brecon Beacons National Park influence the process of erosion and three general situations can be recognised:

- Steep, upper slopes where paths ascend at right angles to contours, e.g. the approach to Corn Du from Craig Cwm Llŵch.

Loose rock, broken from the Plateau Beds of the summit by frost action and foot pressure, falls on to the path below. This, combined with soil removal by surface water, produces an uncomfortable scree of loose material.

- Lower slopes where paths ascend at an angle to the contours, e.g. the path from Pont-ar-Daf to Bwlch Duwynt.

Here the effect of surface water is of greatest importance since the path intercepts and channels the run-off from a wider catchment area. Soil removal and gullying are severe producing a difficult walking surface. Ground water also rises in the path producing boggy conditions in some sections.

- Gentle slopes where paths run parallel to contours, e.g. Craig Gwaun Taf.

Here the main problem is the thicker covering of peat which becomes broken and boggy in wet weather.

As the slope increases, erosion becomes greater due to the combined effects of increased boot damage and increased water flow. On steep slopes, above 25 degrees, soil tends to creep naturally

and thus soil depths decrease with increase in gradient. As soils become shallower, vegetation cover – in particular tree and shrub cover – is reduced and the effect of rainfall is greater.

Much of the Brecon Beacons National Park is within easy reach of major centres of population and people are able to visit for a day trip. This means that many easy walks are heavily eroded due to the sheer weight of numbers. Walkers tend to follow the same route on a hill. These are called 'desire lines' and initially they follow the easiest route or line which provides a good view of the valley below.

Also, in the Brecon Beacons National Park, the paths not only attract large numbers of ordinary tourists but also groups seeking a challenge on the hill, for example military and youth training groups.

Mountain bikes can cause damage to paths as the chunky tyres tear up the delicate vegetation and cut grooves into the paths' top soil. In the Brecon Beacons National Park mountain biking at present does not appear to be a problem on upland paths. Most bikers seem to be sticking to approved routes where paths are regularly monitored and maintained, such as the Taff Trail. Similarly, unmanaged pony trekking and horse riding can cause erosion problems and the NPA has devoted considerable resources in the past to reducing these problems.

Some Green Lanes or Roads Used as a Public Path in recent years have become severely rutted, gullied and eroded by four wheel drive vehicles and motor bikes. This is of great concern to the National Park Authority and particularly so where vehicles have started to drive off the track onto open countryside.

Principles of Repair

There are many possible approaches to the management of path erosion. Davies *et al* (1996) list six management techniques:

- Educating mountain users: using devices such as leaflets and notices explaining path erosion and asking them to help minimise damage by following 'hard' routes.
- Reducing numbers by limiting car parking, or persuading visitors to use other areas which are less likely to suffer damage.
- Using barriers to direct people along a preferred route (eg. walls, plants, stones, water, etc.).
- Re-routing people away from areas prone to erosion, i.e. alternating routes.
- Ensuring that the paths are well defined to prevent lateral spreading/braiding.
- Constructing a hard-wearing, user-friendly path.

Generally the last approach is the main management technique for dealing with severe path erosion. Usually once erosion has begun, complete path repair is the only sure way to slow down further erosion and promote regeneration of the erosion scare.

Most importantly, before attempting any path repairs, identification and prioritisation of the planned repairs should be made. Work should be carried out showing sensitivity to the flora and fauna of the local environment. Repairs should not be visually intrusive and should use locally available material, e.g. stone, plants. There are four main elements to path repair:

- Defining the path line
- Drainage
- Pitching
- Landscaping and reseeding

Defining the path line

Defining the path line reduces further widening of the path and prevents braiding. Paths that take advantage of the strongest desire line and meander gently are best.

Drainage

Water is very erosive and its management is fundamental to any path repairs planned. Drainage needs to do two things: firstly, prevent the path becoming a water course, and secondly, direct water away from already eroded areas; this reduces the scouring action of the water. Reducing the water flow allows eroded areas to stabilise and regenerate.

There are three main ways to manage the flow of water: cambering, ditches and culverts.

CAMBERING – Where possible the path surface is landscaped to promote surface run-off straight into ditches. Cambering helps prevent large quantities of water flowing down the path leading to gullying.

DITCHING – Ditches are dug on the uphill side of the path. These run along the side of the path to catch the runoff, preventing it washing across the path. They also drain water from the path itself.

CULVERTS – Placed at regular intervals, culverts channel the drainage water from the ditches and path across the pathline to the downhill side. The discharge should fall into vegetated areas to prevent soil being washed away. Streams may also be culverted to carry them across and away from paths.

Pitching

Pitching refers to a stone-made path surface which is hard wearing. Steep sections of paths are pitched in conjunction with stone culverts to drain water off the paths. Flat, wet, peaty areas are usually slabbed as this is a quicker and more easily maintained technique of path construction. Aggregate can be used to construct paths on flat or gently sloping ground, however this is not as durable as a pitched or slabbed path and requires more maintenance.

Landscaping

Landscaping is an important part of path repair which in the past has often been overlooked. A carefully engineered path should blend into the landscape.

Re-vegetation

Re-vegetation can help stabilise bare earth but often a protective or stabilising layer is required to enable vegetation to grow in difficult soil conditions. Geojute has been widely used in the Brecon Beacons National Park as a stabilising and protective layer. Geojute is a loose woven netting. It traps soil that would otherwise be blown away and protects germinating seedlings. After 5-10 seasons the geojute will have rotted away – this is sufficient time to allow re-vegetation of the area. Geojute has been used on various sections of steep banks with loose stones and peaty areas. It has proved useful for stabilising soil but it has not been successful for large areas where it is hard to fasten down. Terrabind is a relatively new technique in soil stabilisation of larger areas and has been widely used in soil stabilisation projects throughout the world. It is a wood resin that is water soluble and can be applied to large areas of bare soil by spraying. Weather conditions are important when applying Terrabind, better results are achieved when it is applied in dry weather. Frost can also cause problems with Terrabind as it will break up the resin film on the soil surface. Terrabind has been used in areas of Pen-y-Fan with a varying degree of success. Generally grass cover is increased, the grass is thicker and a darker green.

Re-generation of vegetation is very difficult in upland areas. This is because the cold climate, aspect and altitude all reduce the growing season. There are three ways re-vegetation of eroded areas can be encouraged:

1. Re-colonise from surrounding vegetation by either seed spread or tillering.
2. Seed the area. Seeds can be collected from adjacent area or purchased.
3. Transplanting turves, plants or cuttings. These can be grass turves or shrubs, e.g. heather.

Juncus transplants have been used as a physical and visual barrier to define the path line. These transplants have also been used to stabilise the areas surrounding the outflow of culverts.

Monitoring and Maintenance

It is not enough just to effect the remedial repairs to the footpath and then forget about the area. Careful monitoring is required to ensure that the work carried out has been successful and that further areas have not started to erode. Monitoring indicates how stable the repairs are and indicate the level of maintenance required.

Fixed point photography is a useful method of monitoring providing a clear record of changes in vegetation, erosion, etc. Transects are also used to monitor the change in ground conditions, the degree of vegetation cover and bare earth being recorded.

Workforce and Funding

The Brecon Beacons National Park Authority employs an Upland Erosion Team which works on upland path repair across the Park. However, the central massif including Pen-y-Fan is managed by two full-time National Trust staff and they rely heavily on volunteers. Army cadets and the Territorial Army are also involved in projects in the area.

The National Trust funds all remedial work in the areas it owns, the Brecon Beacons National Park Authority funds the work in other areas of the Park using grant aid from a variety of sources including the Countryside Council for Wales, European Regional Development Fund, European Agricultural Guidance and Guarantee Fund, and European Social Fund.

This publication has used the following sources:

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Peter Davies – “Repairing Upland Path Erosion”.
(Full bibliography details at the end of the text.)

The staff of the National Trust, Blaenglyn, Brecon.
The staff of the Brecon Beacons National Park Authority.
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Other Brecon Beacons National Park Authority Educational Publications:

Basic Facts about the Brecon Beacons National Park
National Parks: Their Origins and Development

BBNP educational publications are available from:

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For the full text of the Management Plan please see the BBNP website:
www.breconbeacons.org

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