5

Cwm Cynwyn

Managing for Change

This chapter identifies dominant issues and drivers of change that affect or are likely to affect the National Park now and in the future. The topics have been chosen because of the breadth of their potential effects. Each carries with it implications for the management of every aspect of the National Park, from wildlife to recreation to community well-being.

This chapter is not intended to be a comprehensive review of all the challenges facing the National Park. Nor is it a detailed review of each of the identified topics. Rather, it summarizes the topics and key implications associated with sustainable management of the Park's resources, special qualities and communities in light of future changes. Further information can be found in subsequent chapters.

5.1. Climate Change

Climatic conditions have always changed on both local and global scales. In the past, change was predominantly a result of natural causes. The most recent changes, however, are proving to be the result of human impact, mainly from the emission of carbon dioxide (CO_2), methane and other greenhouse gases. There are now major concerns about future changes in the climate that will ultimately have significant effects on people's daily lives. The exact changes in climate are difficult to assess, especially for a particular region such as the Brecon Beacons. However, scientists are predicting an overall increase in temperature in the UK primarily in the summer when high temperatures are expected to become more frequent. South Wales is expected to have amongst the highest increases in summer temperatures for the UK. The pattern of rainfall is also expected to change, with summers becoming drier and winters becoming wetter. Winter rainfall is also predicted to fall in more intense storm events than at present.

There is no doubt that climatic change will continue. However, the degree of change will be influenced by the level of global carbon emissions that continue to be discharged into the atmosphere. Various scenarios have been developed by the UK Climate Impacts Programme (UKCIP) to examine regional effects. Climatic change will provide a serious challenge to the future and have wide ranging implications for most aspects of life, from wildlife to planning decisions such as building development in flood plain areas.

This change in climate will have serious implications for all sectors of the Park. Biodiversity could be affected with some habitats becoming extinct and others altered, resulting in some species moving elsewhere if possible to more suitable areas. The risk of flooding induced by an increase in rainfall will have an adverse effect on areas built on the flood plains, with flooding becoming a bigger issue. Farmers may also be affected as they see a change in the crops they grow, where they can grow them and the efficiency of grazing land. Archaeological resources and other components of the historic environment may be affected significantly by changes in climate, too.

As well as reacting to these challenges the National Park can also adopt proactive approaches to reducing the local "carbon footprint". The Beacons Bus project is an example of how overall vehicle CO_2 emissions are reduced whilst encouraging enjoyment of the Park by visitors. Schemes such as the Talybont community's hydroelectric scheme demonstrate how using renewable resources need not adversely affect the special qualities of the National Park. By undertaking renewable resource schemes, in particular small-scale hydroelectric schemes, the Park will be in a strong position for adaptation if the climate changes as predicted.

5.2. Biodiversity

The term biodiversity is used to encompass the whole range of living organisms - including humans - that inhabit the Earth. Millions of years of evolution have produced a huge variety of different species. These species live together to form distinct habitats and each individual is different from

Red Kite

others of the same species. This variety of species, habitats and individuals can all be described in one word: biodiversity. It is all around; people are part of it and dependent on it. The most basic needs of oxygen to breathe, soils and nutrients to grow crops and insects to pollinate them are provided by biodiversity.

Humanity's influence on biodiversity can be seen in the landscape. The habitats and species living here today exist as a result of human management of the land to produce food, timber, minerals and living space. People do not live within a natural environment, but a semi-natural one, a place where naturally occurring habitats and species still exist but their form and location is dependent on where human activities have allowed or encouraged them to be. People have created the landscape of fields, hedgerows, woodlands and settlements, the product of thousands of years of human habitation, farming, forestry and water management.

The landscape may be modified from a natural state but it is still rich in biodiversity. This biodiversity appeared and was maintained as a by-product of land management. However, the farming and forestry practices that created this biodiversity have changed immensely. Mechanisation, artificial fertilisers, land drainage, pesticides and specialised production of a single crop or livestock has revolutionised farming. These agricultural methods increased production but in doing so reduced the extent of habitats relied upon by many species. Just as surely as biodiversity is a product of farming, the declines in species are a response to modern farming practices. This creates an enormous challenge for the future: biodiversity would not and cannot exist without farming, but suitable space for wildlife is ever more scarce within the modern, intensely farmed environment. Here today's society stands to learn much from traditional, sustainable farming practices.

5.3. Farming Pressures

The landscape provides people with a place to live, as well as providing food. The population has grown, requiring more space for housing, roads, workplaces and the other aspects for modern lifestyles. These developments require space, land that would otherwise serve as semi-natural habitats supporting many species. The second big challenge is ensuring that declines in habitats and species resulting from development do not continue.

Humanity must now conserve biodiversity within a changing climate. Native species are here because the climate has suited them. As the climate changes, species will move elsewhere or disappear and new species will arrive. Allowing species to move through a highly modified landscape is essential so that enough species remain to form functioning ecosystems. As well as responding to climate change, natural systems help to mitigate the effects of climate change. Whatever the effects of climate change will be they will be more profoundly felt in environments with impoverished biodiversity.

The landscape of the Brecon Beacons is dominated by pastoralism - both enclosed lowland pastures and wide open uplands. It is an area that has been shaped by pastoralism over thousands of years. The well-being of the farming community is therefore fundamental to the future of the landscape and communities of the National Park. If livestock grazing were to decline, this may lead to an increase in rank and coarser

vegetation, including the possibility of scrub encroachment in places. There are also significant risks if grazed habitats are abandoned, under-grazed or are not grazed with a particular type of livestock such as cattle or ponies. More extensive grazing systems generally result in opportunities to increase biodiversity, assuming the grazing intensity is matched to site conditions. Visual appearance, grazing quality and the ability of the public to access and enjoy these areas become benefits of a well-grazed landscape.

Over time any changes have been influenced by personal circumstances and prevailing economic conditions. At present the livelihood of the farming community is under significant pressure from a number of challenges. Reform of the Common Agricultural Policy (CAP) has adjusted the money paid to farmers, partly to enable farm businesses to respond better to market trends. Part of these subsidies has also been diverted into agri-environment schemes that are aimed at delivering public benefits on farm, such as biodiversity conservation. This has produced an ageing farming community that is naturally risk-averse, at a time when innovation and collaborative working are essential to survive. Some farm businesses are responding to the changes by buying up neighbouring farms, resulting in fewer but larger farms. Whilst this may be good business sense for the farm involved, it could be counter-productive within the National Park because small, family farms have characterised the farming community in the Park for generations; frequently it is these farms that support the most biodiversity. Others are simplifying their farming systems and working part-time off the farm. This is of particular significance as the more marginal land, for example commons, are not being grazed at all by many farmers who would previously have put stock there. Vital skills, difficult to replace, are being lost as farmers leave or retire from the industry. It is difficult for new people to enter the farming business. Diversification has helped but is not a solution for every farm.

Hay bailing at Court Farm, Llanthony

Farming, the community and the landscape are all interdependent. The challenge is to maintain a viable farming community to ensure the protection of the traditional landscape and communities whilst meeting the growing demands of food security. As mentioned in the report "Sustainable Farming and Environment: Action Towards 2020," the need for change is easy to recognise but harder to deliver. Nevertheless, the need for sensitive land management by and for the local farming community must be a priority.

5.4. Local Population Pressures

Predictions indicate that the Park's population will increase in the foreseeable future. Whilst there is an anticipated decline in the natural population, an overall increase is expected via in-migration. The intrinsic quality of the Park combined with easy access to the M4 corridor has made it a popular destination for commuting from and retirement to. This has increased the cost of housing in an area with an already high ratio of house price to income. This scenario has become a particularly difficult problem for young, local people wishing to remain living and working in the National Park. The housing problem is accentuated by the current trend towards more but smaller households. A key local issue then, is the provision of housing which is affordable, has low environmental impact and is energy efficient, with access to fundamental services. This can help maintain sustainable communities in high quality environments. Another challenge is the in-migration of retired people - one of the causes of the Park's above average ageing population and below average birth rate.

These pressures have a range of implications for the National Park, from energy consumption to planning to social services. For example, consideration of national planning guidance in concert with climate change predictions indicates that no further development should occur in the floodplain, the area in the Park where development has historically occurred. This means that new sites for future development need be located to meet population pressures. This will be an issue given the limited environmental capacity for development that exists in the National Park. A fine balance will obviously be required to meet population pressures, satisfy the Park purposes and duty whilst addressing climate change scenarios.

New residential development near Abergavenny

5.5. Renewable and Non-renewable Energy

The world's supply of fossil fuels (i.e., non-renewable resources) will become economically depleted in the foreseeable future. A growing number of scientists believe that demand has already surpassed potential supplies for oil worldwide (often referred to as "peak oil"), leading to depletion of supplies within the next 50 years. Although oil resources will not disappear completely, they will become too expensive or too difficult to recover, affecting fuel prices in the near term. At this point, humanity will have five choices: 1) recycle or reuse existing supplies; 2) waste less; 3) use less; 4) find a substitute; or 5) do without. People will need to consider these scenarios carefully whilst planning future management options for the National Park.

The significant increase in carbon dioxide (CO_2) from conventional energy production has increased society's focus

Potential energy source

Solar panels in Scethrog

on the provision of renewable energy options. When the UK Government signed up to the Kyoto Protocol, it set itself a domestic target of a 20% reduction of CO_2 emissions, below 1990 levels, by 2010. Locally the BBNPA has an important part to play both through a practical and an advisory role. Reducing the problem can be achieved through energy conservation and also through the production of alternative, renewable energy.

Reducing energy can be achieved in a number of ways. The BBNPA as a planning authority is in a unique position to assist by giving energy saving advice as well as technical advice on installation capacity and feasibility. Policies can be designed to encourage renewable energy generation and energy conservation in old and new buildings and on a district and commercial scale. Public transport schemes like the Beacons Bus assist in reducing the amount of travel by private car, and recycling schemes can reduce energy requirements. One of the most promising means of reducing travel is by more efficient and effective use of the internet and other forms of computer technology. These tools are currently underutilised, but their full potential is likely to be investigated and harnessed over the next 20 years.

The BBNPA can also assist through the promotion of alternative energy. Small-scale renewable energy schemes will generally be encouraged as long as they fit in with environmental and design factors and do not degrade the Park's special qualities. The BBNPA's Renewable Energy Assistance Programme (REAP) offers advice and grants for most forms of micro-renewable energy sources including solar thermal, hydro-electric, wood-fuelled heat systems, heat pumps and wind. The hydro-electric scheme at Talybont illustrates a way forward to provide energy at a larger scale. It is less intrusive than wind farms, conserving the natural beauty of the landscape. Modern wood fuel heating systems can provide a highly efficient source of renewable energy. Fuel can be easily stored and produced locally, reducing transport costs. Growing wood for fuel locally can also provide employment in the area and give residents an opportunity to manage the land in a sound environmental way, whilst providing woodland habitat and better absorption of rainfall to reduce flooding.

In some areas the production of crops for biofuels may also be an option for generating renewable energy. However, biofuel crops are not well-suited to the majority of the Park's landscape and soils. Large-scale biofuel crop production on the lowlands would further reduce biodiversity, reduce the amount of land available for food production, require high energy inputs and continue to add to greenhouse gas emissions. For these reasons, wood fuel is preferable to the production of crops for biofuels, though biofuel crop production remains an option for economic gain so long as its production conforms to the Park's purposes, duty and planning regulations.

Talybont-On-Usk Energy - Community Hydro Electric Turbine

A feasibility study in 2001, undertaken for the BBNPA Sustainable Development Fund backed **"Three Parks Energy Project,"** identified Talybont-on-Usk as a suitable location for a renewable energy project in the Brecon Beacons National Park and a project to restore hydroelectric generation from the compensation flow at Talybont Reservoir as a feasible community scheme.

Public meetings resulted in the formation of **Talybont-on-Usk Energy**, a limited company with charitable objects. The objects are:

- **To advance the education of the public into renewable energy sources, uses of alternative energy and related ecological and environmental issues;**
- **To promote renewable energy schemes in and for the benefit of the community of Talybont-on-Usk including provision and maintenance of a hydro-electric generating turbine at Talybont-on-Usk Reservoir;**
- **To advance the relief of poverty and the preservation and protection of health, primarily but not exclusively in the Talybont-on-Usk Community Council area, by promoting the efficient use of energy (including energy for heating purposes) and utilisation of renewable sources of energy.**

The hydro project involves the re-installation of an electricity generating turbine, using the compensation flow from Talybont Reservoir (water which is released to maintain the Caerfanell River ecosystem). This discharge varies over the year according to a schedule stipulated by the Environment Agency. The turbine and all the associated controls and meters are housed in the existing turbine house below the dam, constructed at the time the dam itself was built by Newport Borough Council in the 1930s.

The new 36kW Valley Hydro crossflow turbine will produce an annual energy output in the region of 240MWh valued at around £17,000 in 2009. The electricity generated will be sold under the Renewables Obligation to a Public Electricity Supplier via the National Grid. Talybont-on-Usk Energy will re-invest the proceeds from the sale of the electricity in a range of further energy projects in the Talybont-on-Usk Community Council area. All this will be managed by and for local people, and has the potential to be a model for small-scale renewable energy generation. Talybont hopes to become the first carbon neutral village in Wales.

The project will result in greatly enhanced community awareness about energy efficiency and the benefits of generating energy from renewable sources. The hydro site will incorporate display materials - aimed at the local community, schools and visitors. These will demonstrate the current and cumulative energy generation of the scheme over time, describe the history of the scheme and illustrate how the hydro works.

The Talybont-On-Usk Energy Project is a prime example of what **The Green Valleys Initiative** is trying to achieve (**see Section 7.1.11 Energy**).

5.6. Transport

The transport infrastructure is important both for the local economy and in the recreational use of the National Park. The dispersed pattern of the settlement of the Park has created issues for a public transport network. Whilst some parts of the Park have reasonable service, most of the area is not well served, increasing dependence on private vehicles. The reduction of the number and length of journeys as well as the development of a more sustainable form of transport

The A40 at Bwlch

would have a number of benefits. Reducing the number of car journeys in the Park would decrease its "carbon footprint" improving the quality of the Park's environs and the tranquillity of the area, thereby contributing to enhanced special qualities.

An integrated transport system could also encourage more healthy and active lifestyles. Some improvement has been made with a new cross-Wales transport service and the BBNPA's Beacons Bus, which enable people to visit the Park without a car. Ultimately, though, to be more sustainable, significant investments need to be made toward safe and efficient walking and cycling networks in the National Park.

5.7. Globalization

Humans have a long history of altering the Earth's environs to suit their needs. In fact there is nowhere in the world that cannot be reached through human ingenuity and nowhere that is free from human impact. People have driven to the North Pole, climbed Mount Everest, and flown to Antarctica. Food in local supermarkets is available from anywhere in the world at any time of year. Chilean strawberries can be grown in gardens in Wales.

But, globetrotting and conveniences come at a price. Species and habitats are becoming less diverse on a global scale as a result of human activities, primarily through habitat fragmentation and destruction and the introduction of non-native species. Cultures, traditions and economies, too, are becoming more uniform because of humanity's global activities. This results in a loss of local skills and knowhow. Even climate change is a symptom of globalization, caused by three escalating factors - population, affluence and technology. Humanity's influence on the world is so great that geologists and historians are dubbing the current period in Earth's history the Anthropocene.[12]

There are over 6.7 billion people on this planet as of 2010. If all these people lived the lifestyle of the average Westerner, it would take the resources of three Planet Earths to support them.[13] The United States and Western Europe continue to consume disproportionate amounts of resources. Simultaneously, the emerging economies of China and India, with 1.3 billion and 1.1 billion people each, respectively, continue to expand their rate of development (e.g., more coal-fired power plants, airports, cars, consumer goods) and will soon dominate global economic and political agendas.[14]

12. The term "Anthropocene" implies that humans now shift more surface geology and affect the fate of more biodiversity than all other natural forces combined.
13. Miller, G. T. 2002. Living in the Environment: Principles, Connections, and Solutions, 12th Ed. Thomson Learning, Inc., Belmont, CA, USA.
14. Shenkar, O. 2006. The Chinese Century: The Rising Chinese Economy and Its Impact on the Global Economy, the Balance of Power, and Your Job. Wharton School Publishing, New York, USA.

Erosion on the Black Mountains

Fly tipping

How long the Earth can sustain this level of consumption is uncertain. The message is that the planet cannot support current trends in global development; innovative solutions are needed to slow the momentum, reducing consumption and increasing self-sufficiency.

With respect to the Management Plan, the mantra *"think globally; act locally"* rings true now more than ever. The BBNPA and its partners must place the Park's communities in the wider realm of global citizenry. In so doing, these trends must be considered in planning the management of the National Park twenty years hence, and action taken accordingly.

5.8. Interactions

Whilst the previous topics are treated separately in this chapter, each interacts with the others in complex ways to create synergistic effects that exacerbate existing management concerns. Climate change, for example, cannot be considered in isolation; it will affect farmers and farming practices. Changes to water availability and growing seasons will affect crop yields and grazing practices at a time when farmers in temperate climes will be asked to provide more food for greater numbers of people in areas marginalised by climatic effects. National and international food security issues are likely to escalate as rising costs associated with petroleum-based fuels and agricultural chemicals put an increasing burden on the farming community. Farming practices and relevant government policies are likely to change as a result of these pressures in order to provide the greatest good to the greatest number. As a result, biodiversity will undoubtedly be affected both positively and negatively in ways as yet unforeseen. These interactions have implications for farming and other forms of land management in the Brecon Beacons National Park.

This series of cascading effects is but one example of potential interactions that could develop in the future, affecting both the Park and its communities. Other existing or likely changes are highlighted in subsequent chapters of the Plan, particularly **Chapter 7**. Strategic objectives and priority actions in this Plan have been developed through partnerships and public consultation to assist in the management of the National Park with these forces of change in mind.

Figure 5.1. **Significant challenges facing the National Park and its communities, 2010-2015**