

Seminar report

Climate change: the challenges and opportunities for protected areas

Europarc Atlantic Isles Seminar, 26-27 March 2007, King's College, Cambridge

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1. Introduction

Over 40 delegates from all corners of the British Isles and beyond gathered in Cambridge to focus over 24 hours on the key issue of our time.

Organised by Europarc Atlantic Isles, the body which brings together the protected areas of the UK, Ireland and Iceland, the seminar examined the effects of climate change.

We shared the city and the topic with Al Gore, who was in town with a similar mission, But our thoughts, while starting with the global implications of this huge challenge, were on our areas – both protecting them and how they can contribute to the bigger picture.

Professor Brian Moss set the scene, explaining the delicately balanced ecology of the earth. He appealed to protected areas to seize the opportunity to prove their worth as holders of some of the world's last remaining intact and therefore robust biodiversity, which holds the key to survival for the planet.

He called for expansion, stressing that buffer zones are essential, that “no protected area can ever be big enough” and that connectivity between areas will be crucial. Above all it will be necessary to think independently, and have strategic ideas ready to use as the inevitable changes occur.

He was followed by a range of speakers, drawing out different elements of the challenges and opportunities facing protected areas, from wide ranging policy analysis to a focus on effects and the response in terms of management. Dr Patrizia Rossi, the director of the Parco Naturale Alpi Marittime, Italy, gave a wider European perspective and showed how essential sustainable approaches to tourism are – and will continue to be.

We finished the day going back to basics, looking at current and future effects of climate change on our areas, and with Richard Lloyd's drawing together of key conclusions and actions. Edited notes of the proceedings follow, and on this CD you will also find the speakers' full presentations.

I hope you will find this useful in your own work with protected areas, and take the chance to disseminate these points more widely to colleagues. I look forward to seeing you at forthcoming Europarc Atlantic Isles seminars and events, where we can continue to work together.

Martin Lane

Chairman, Europarc Atlantic Isles and Cotswolds Conservation Board

2. Climate change: challenges and opportunities

Brian Moss, School of Biological Sciences, University of Liverpool

Our particular human arrogance is that we think we make the rules about how our planet should be run. In reality the rules are made by our position in the solar system, the accident of our planetary elemental composition, and the huge biomass of microorganisms that has moulded the chemistry of our atmosphere and oceans to an equable state secondarily capable of allowing large organisms like ourselves to exist.

At present we are conducting an experiment in altering the composition of the atmosphere with extremely threatening consequences for our climate and the stability of our societies. But it is only one of a series of experiments that concern the destruction of the natural systems on which we depend for goods and services, vastly more valuable than the artificial GDPs of all the world's cash economies put together.

Those who are concerned with the management of protected areas are the custodians of the remnants of these systems. They are hard pressed and marginalised but theirs is the key role for the future. Without maintenance of huge areas of such systems in a reasonably intact ecological state, the indications are that our current climatic peril is merely a taster of what could ensue.

The threats of climate change to existing protected areas are many. Cherished communities of plants and animals will face extinction with only small possibilities of replacement by communities of parallel diversity, because the rate of change is so high. Invasive 'weedy' species are likely to become dominant. The future is of water hyacinths, prickly pears, common carp, gulls, foxes, rats and rabbits. Extension of existing parks polewards is the only mitigation possible.

But there is also an opportunity. The results of our current climatic experiment are highlighting how important it is to maintain natural systems. If the pH of the ocean falls by more than a fraction owing to absorbed carbon dioxide, and can then hold no more, or if the tundras release their enormous stock of methane, the prospects of a runaway heating effect are dire. The argument is being graphically made that a huge extension of protected areas is needed, neither for amenity nor ethical nor cultural reasons, though all these are apposite, but simply for the survival at all of large mammals including ourselves.

The UK and other greatly damaged European countries must set examples of creating such areas or their credibility to the rest of the world will be undermined. This is not to deny that there must also be an adequacy of developed areas also, but there are ways of managing developed landscapes that contribute to survival rather than detract from it. Rather than be museums of mediaeval management they must become working landscapes that create attraction and interest in their new detail. An example will be drawn from the essentially cultural landscape of the Norfolk Broadland.

Ecological thinking, that of r and K selection, also offers guidance in the nature of human communities that are more likely to cope with the consequences of even our present experiment. At present, in the western world, we are a 'panda' society, pampered and preserved by high technology, highly specialist, inflexible, dependent entirely on specific resources. Oil is to us as particular species of bamboo are to the dietarily- limited pandas. Pandas are unlikely to survive. We need to emulate the fox.

3. Managing Climate Change in Protected Areas

David Thompson, Senior Specialist Climate Change Policy, Natural England

Introduction

1. What will climate change mean for the natural environment?
2. How is Natural England responding to the climate change challenge?
3. What role can protected areas play?

Impacts of Climate Change on the Natural Environment

Climate change is real and it is happening now at an unprecedented rate. The impacts on already vulnerable landscapes and ecosystems are of critical conservation concern at a global and national scale.

Much of England's natural environment is impoverished and intensively managed. There has been significant and widespread loss of semi-natural habitats, mainly due to agricultural intensification. Many species are now trapped in relatively small, isolated sites surrounded by inhospitable land uses. They are unable to move in response to a changing climate, which makes them vulnerable to extinction.

Natural England and Climate Change

For Natural England, responding to climate change is a strategic priority. Our objective is to increase the ability of the natural environment to:

- adapt to the impacts of unavoidable climate change;
- contribute to reducing greenhouse gas pollution.

Adaptation

We must seek to increase the natural environment's resilience and reduce its vulnerability to the impacts of climate change by:

- continuing to conserve and enhance existing biodiversity, particularly in protected areas;
- adopting a landscape-scale approach to conservation management in which protected areas are the building blocks;
- identifying where large clusters of semi-natural habitat occur and seeking to maintain and enhance the connectivity of such landscapes;
- reducing habitat fragmentation by building resilient natural systems.

Mitigation

The natural environment can make an important contribution to reducing greenhouse gas emissions by:

- substituting and reducing the need for fossil-fuel based energy production with technologies such as wind, biomass and biofuels, marine, solar and hydro energy;
- removing ('sequestering') carbon from the atmosphere and storing it in 'carbon sinks', especially in soils and vegetation.

Natural England will support increased investment in clean energy technologies in appropriate locations. We will develop a risk-based approach, which balances any short-term impacts on the

natural environment with the long-term imperative to reduce the threat of dangerous climate change.

We will also aim to enhance 'carbon management' by farmers and land managers by promoting the role they can play in:

- maintaining, restoring and creating semi-natural habitats which act as carbon sinks (such as peatlands, woodlands, saltmarsh, heathlands, reedbeds, etc);
- taking-up sustainable practices that will enhance the capacity of agricultural land to store carbon (e.g. by growing bio-crops, increasing field margins, composting, etc).

Role of Protected Areas

(This is the personal view of the speaker and not Natural England's formal position).

1. Adaptation: can help to deliver the 'landscape-scale' approach, which must be incorporated into protected area's management plans.
2. Energy: could proactively contribute to accelerating the uptake of renewable energy. For example, assess where renewable energy technologies could be developed within protected areas at an appropriate scale in ways that would not be counter to their statutory purposes?
3. Carbon management: potential role in identifying and mapping carbon sinks and developing mechanisms that will give an economic value for their maintenance and restoration.

4. Adapting to Climate Change - A Case Study in North and East Norfolk **John Ash, Technical Director, Risk & Policy Analysts, Loddon, Norfolk, UK**

Introduction

The coastline of Norfolk is dynamic with low-lying areas subject to flooding and soft cliffs eroding. Most of the low-lying coastal areas are in North Norfolk and the Broads (in East Norfolk) and are internationally designated sites under the Habitats and Birds Directives and there is therefore a legal obligation to prevent damage or loss of integrity. Cliff top dwellings are currently being lost as a result of the eroding cliffs at Happisburgh and the Draft North East Norfolk Shoreline Management Plan has identified other villages at risk. There is currently no mechanism for compensating owners for their lost asset. For sustainable management of the coastline with increasing sea levels and storminess, clear policies are required that are both acceptable and affordable to society and the local population.

Historical Context

The past 2000 years have seen significant changes to the Norfolk coastline. The higher sea levels of Roman times gave a coastal landscape dominated by estuaries in both North and East Norfolk. As sea level dropped these areas became intertidal habitat and then, with rising sea levels in 12th and 13th centuries land started being protected by defences. This is the situation today although rising sea levels have required larger defences and in some cases pumping stations to drain the land.

Over the past 800 years erosion to the coastline of North East Norfolk has resulted in the loss of some six villages. The construction of coastal defences over the past 100 years has given rise to a 'fixed' coastline and this gives the mosaic of habitat and developed areas we see today.

Current Issues

The UK Government's aim for managing the coast as set out in "Making Space for Water" is:

"To manage the risks from flooding and coastal erosion by employing an integrated portfolio of approaches which reflect both national and local priorities, so as:

- to reduce the threat to people and their property; and
- to deliver the greatest environmental, social and economic benefit, consistent with the Government's sustainable development principles.

To secure efficient and reliable funding mechanisms that deliver the levels of investment required to achieve the vision."

The NE Norfolk Shoreline Management Plan identifies the defence of the villages of Overstrand, Mundesley, Trimmingham, Bacton, Walcott and Happisburgh as not being sustainable or economically justified in the long-term. This would give rise to the loss of 80 houses and 5 commercial premises by 2025 and some 1,000 houses and 170 commercial premises by 2105. The rationale behind the policy of allowing erosion to take place is that because of the rapid natural erosion rates fixing the shoreline in any location will result in a sizeable promontory forming. This would then act as a terminal groyne in the long-term, with material reaching this point more likely to be deflected offshore and lost altogether rather than either remaining as a beach in front of these defences or reaching destinations down the coast.

As stated previously there is no mechanism to compensate property owners or manage the removal of properties until they become uninhabitable when the local authority has powers to demolish the house and re-house the occupants.

The case for protected conservation areas is different in that they are afforded protection by law and those areas in North Norfolk are either being protected or in some cases relocated. Recent research (Defra 2005) suggested that the cost of maintaining the existing standard to all fresh and brackish water protected areas in England would be some £870 million (discounted) over the next 100 years. The replacement cost was estimated as £470 million (discounted) although it is unlikely that replacement sites would provide the same level of biodiversity as the existing sites.

Based on Defra (2005), in North Norfolk the defences to Holme grazing marshes are estimated to cost some £10 million to maintain (discounted) and £14 million to relocate. This relocation cost is comparable to the loss of 56 houses valued at £250,000.

There is a general feeling by many of those at risk from eroding coastlines that the present system is unfair and that 'birds are provided protection but people are not'. There is therefore a need for policies to manage change in an equitable and fair way.

The Future

Defra are investigating the current scale of the erosion threat to England and exploring a number of potential methods (adaptation strategies) to assist those whose properties are at risk. These include some form of buy-out, rebuild costs, and use of local authority well being powers as a vehicle to assist those at most risk.

There also needs to be clear vision and long term planning for both the built and natural environment in order to manage change. This will require much closer co-operation of government departments and local authorities to achieve multiple benefits at a regional level where both protected areas and people are managed in a sustainable way that is fair and affordable.

Conclusions

The effect of rising sea levels and potential increased storminess, together with the need to provide sustainable solutions that work with nature, are a challenge to those with responsibility for managing the coastline. Preservation is an option that we cannot and may not want to afford. It is therefore vital that there are mechanisms in place to manage change that are both fair and affordable. To quote from the Foresight Report 'Future Flooding': "We need effective dialogue with the public and other stakeholders so they understand the risks and choices. In particular, they need to appreciate the choices that need to be made, and that there will be a cost whichever path we take. They need to understand that early decisions, before the risk is apparent, may, in the long term, minimise the total costs – economic, social and environmental".

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5. The climate challenge for practical management

Suzanne Goodfellow, Director of Park Management, Dartmoor National Park

The challenges that climate change will present for protected area management were explored using the Dartmoor National Park in the UK as an example.

The most recent climate scenarios were outlined – hotter, drier summers; warmer wetter winters, increased storminess, etc. Likely impacts on the natural environment include changes to moorland, woodland and wetland vegetation, declines in northerly species and new more southerly species arriving. Longer growing seasons will necessitate an increase in resources for footpath maintenance. Historic buildings are likely to also require more maintenance as high winds and rainwater penetration cause damage. The impact on the archaeology of Dartmoor is unclear but increased vegetation growth is already causing more subtle features to disappear. Hotter, drier summers are likely to result in more visitors and the season is likely to be longer with warmer autumns and earlier springs. Erosion is likely to increase on footpaths and riverbanks. All of these impacts are likely to be echoed in other protected areas in the Atlantic Isles.

What can we do to mitigate and adapt to climate change? There is no single solution but an overall philosophy of embedding climate change ‘proofing’ in all our activities will go some way to reducing the impacts and allow us to maximise opportunities.

Examples and illustrations were given of the following activities on Dartmoor:

- Raising awareness of the impact of climate change on our local area (through a climate change exhibition in summer 2007, climate change guided walks, tailored projects with local schools, web-based resources, Dartmoor Visitor newspaper ‘climate change edition’ etc)
- Managing land to create a robust natural environment (enhancing habitats with local communities through the Natural Networks Project, rewetting the blanket bog, new woodland links, etc)
- Promoting sustainable tourism and transport (Freewheeler bike bus, Sunday Rover bus, care share schemes)
- Using the planning system positively to encourage sustainable building and renewable energy (zero energy houses)
- Promoting the Dartmoor Sustainable Development Fund to help with renewable energy schemes and encourage local communities in innovative projects.
- Making our own business practices as sustainable as possible.

In conclusion, protected areas are already doing a lot of work to mitigate and adapt to climate change as part of their daily activities, but we need to be bigger and bolder in both our thinking and actions.

We are in an excellent position to rise to the challenge of climate change. We have extensive practical experience of managing land in an integrated way which will enable us to create robust landscapes. We also have access to a wide and largely receptive audience and can share knowledge of the impacts of climate change in our local areas and work towards solutions in partnership.

We can make a real difference to places and people if we join all this up and work together!

6. Sustainable tourism and climate change effects

Patrizia Rossi, Director, Parco Naturale Alpi Marittime, Italy
Chair, Europarc Sustainable Tourism Charter Evaluation Committee

Climate change is a reality, as an analysis of the present situation in the Region where I live (Cuneo, Piedmont, Italy) with meteorological data shows. Trends from the fifties to the present day, and comparisons, reveal this change as consistent and striking.

The area is in a very sensitive position, with high mountains 50km distant from the sea. The heavy influences of climate change include species decreasing and glaciers disappearing.

Therefore the mass ski tourism industry is not sustainable: it needs artificial snow and an analysis of costs and impacts on the environment reveals the problems.

Sustainable tourism is the answer, and the European Charter is a tool. The European Charter for Sustainable Tourism in Protected Areas concept, general information, developments and network was introduced.

Examples of its application in some European low mountain parks were explained, including Parc National des Cevennes (F) Parque Natural de la Zona Volcanica de la Garrotxa (E) and in the transfrontier area of Parco Naturale Alpi Marittime (I) and Parc National du Mercantour (F).

Examples of tourism activities not influenced by the climate change were given: walking, discovering of the parks values such as nature and culture:

- Nature: examples of projects like the bearded vulture reintroduction, the wolf enclosure and visitor centre, the botanical garden and the butterflies garden...
- Culture: the rye festival and ecomuseum, the royal accommodations, gastronomy and traditional products.

An example of working together is the successful Association "Ecoturismo in Marittime" and the training for the local tourism enterprises, which results in care for the environment by businesses in their everyday work.

CONCLUSION: Climate change is everyone's responsibility!

7. 'Heatwave': an interactive demonstration Meg Amsden, Nutmeg Puppet Company, Suffolk

My work has always been based on a profound concern that children (and indeed adults) have become dangerously dislocated from the natural world. This concern is reflected in 24 of the 41 puppet shows my colleagues and I have produced since the late 1970s.

When performing one of our early shows on the beach at Southwold (The Angry Sea and the Pirate's Treasure, about rubbish in the North Sea), we were head-hunted by the Broads Authority, in the form of Diana Shipp, and asked to tour the Broads in the summer of 1985. Until this year, we have continued to produce and tour shows every summer, and in the last 8 years have also produced related workshops with teaching materials, and toured them and the shows around Broads schools as well.

I believe there is no point in delivering facts to our audiences of children, or families on holiday. Facts are mutable and hard to digest anyway, so we like to show, as much as possible, rather than tell. Our stories are exciting and the characters attractive and believable (and by attractive I don't necessarily mean pretty or good). A situation develops, and the people and animals in the story find ways to cope with it.

In 2003 we were commissioned to produce a show on the subject of climate change, for families on holiday, and children in six Broads schools; and also to present the show to the international Living Lakes conference at the UEA Norwich. At that time, climate change, though much discussed in scientific circles, was not a general topic of conversation. By 2006 when we decided to revive the show, the situation had completely changed. The subject has rarely been out of the news since, and has become part of the school curriculum. We were given a grant by the Sustainable Development Fund to update and partially rewrite the show, to highlight the idea of managed retreat, since this is very pertinent to our low-lying, watery and sinking region of Britain. We were also funded to produce related workshops and teaching materials for 7 – 11 year olds.

The commission put me (and my research colleague Nicky Rowbottom) in a quandary. As a regular reader of *New Scientist* it's clear to me that scientific theories come and go; that orthodoxies develop and those who don't toe the line can be unfairly vilified or ignored. The world of global warming/climate change is no exception to the rule. My own instinct is to explore the unorthodox and always question sources of information and its interpretation. (It's one of the things I picked up here as a student.)

When we first researched the show in 2003, one of our chief sources of information was Prof Kerry Turner, who said that whether it could be proved or not that our CO₂ emissions were causing global warming and responsible for accelerating climate change, there was still the point to be made that our use of fossil fuels was unsustainable and polluting, leading to ill health and environmental damage. This seemed like common sense to us.

We decided to demonstrate the possible effects of climate change very simply, setting the first half of the show in a heatwave, and the second in a flood.

The first tour was a great success, and amazed the Living Lakes conferees, who clapped whenever we paused for breath or a scene-change. The second tour fortuitously coincided with a heatwave at the beginning of the tour and storms and flooding for the rest of it. We were able to offer the show to 15 schools in the Broads at a subsidised rate, and workshops to 10 of them. All the schools that booked the show received teachers' packs.

8. 'Delivering key messages': an interactive session

Lucy Galvin, Communications officer, Norfolk Coast Partnership

Protected areas are set up to look after places for the future. There are huge changes afoot which will make 'conservation' as we know it a thing of the past. Already many key messages of protected areas – sustainable living, respect for biodiversity – are being used by big commercial interests as part of their marketing. It will be important for protected areas to redevelop and clarify their key messages around climate change as part of strategic thinking for the future. To start to do this it is necessary to focus on the effects – both immediate and long term – of this change. Together delegates identified climate change effects and grouped them into four broad areas:

<p>Landscape and habitats</p> <p>Unseasonal births lead to animal infant mortality Year round grass paddock growth Seasonal migrating birds Extremes of weather within short period of time Lack of frost = pests Impact on biodiversity, wildlife and plants – some species will be lost, others gained (but beware invasive species) – also need to redefine 'exotics' Invasive species – plants, insects Heath, conifers, brackenisation (Cannock Chase) Habitat change affecting iconic features Habitats and species change (not predictable) Significant visible landscape change New habitat = new vegetation = new species Drought = heathland fires, trees dying Changes in agriculture, crops Better management of existing, neglected woodlands through expanding woodfuel market Natural environment 'squeezed' (eg agricultural intensification, biofuels, etc) Pressure to produce food and energy and competition between these Loss of beech woods in the Cotswolds AONB Clear need for baseline knowledge and monitoring programmes</p>	<p>People</p> <p>Heat wave/bad air quality – hay fever/asthmatics Effects on communities/people – change to lifestyle Mosquitoes Outdoor events – cultural Human behaviour change – positive and negative – goods and services Changes in visitor patterns, numbers and behaviour Thinking differently – learning to change Changes to buildings – more robust detailing – shade, water harvesting, passive solar gains, siting and location changes to housing layouts Moving vulnerable infrastructure out of floodplains – electricity sub stations</p> <p>Need to change public perception – coastline is not static – not sustainable to maintain Victorian defences More tourists - flights more expensive, climate milder People travel abroad because wet – need sunshine</p>
<p>Water levels</p> <p>Flood River valleys flooding – workability of soil Storm damage – to coast especially Coastal erosion, loss of property, businesses and coastal paths (access and recreation) – public safety Coastal erosion Coastal erosion, more storms, wetter Immediacy and uncertainty of flooding Hotter summer, dryer summer, wetter winter, stormy – rapid water runoff – flooding Coastal squeeze, loss of intertidal habitats, opportunities for habitat creation Restricted water supply (summer); winter flooding Flash flooding, soil erosion, siltation of watercourses Flooding (sea) and salination</p>	<p>Policy</p> <p>Financial disruption Political instability Protected area boundaries may no longer be relevant Clarity of understanding and response to the problem Changing values and priorities – perception of landscapes Govt agencies and business should set an example – Govt Depts, National Parks, AONB teams should lead Decisions – unpopular decisions – need for choices Uncertainty – brink of a catastrophe?</p>

9: Summary and Conclusions

Richard Lloyd, Europarc Consulting

The theme of the seminar is challenges and opportunities for protected areas. While the challenges are daunting, there is much that could be done and should be done in protected areas to lead the way. The following action points are drawn from the presentations and discussions over the two days of the seminar.

Actions for Europarc Federation

- Take on board the climate change agenda in its forward work programme
- Encourage more protected areas to seek the award of the European Charter for Sustainable Tourism
- Review the criteria for the award of the European Charter to ensure that climate change issues are fully addressed

Actions for UK Government and its Agencies, especially Natural England, Countryside Council for Wales, Scottish Natural Heritage and the Environment and Heritage Service (Northern Ireland)

- Provide protected areas with advice on monitoring climate change impacts and on visualisation and scenarios
- Provide protected areas with advice on adaptation measures
- See protected area managers as key deliverers of climate change research and adaptation programmes, and develop and fund partnership projects
- In their advocacy role, influence planning policy and other strategies in the move towards a low carbon economy

Action for the Association of National Park Authorities and the National Association for AONBs

- Demonstrate to Government the ability of protected areas to deliver on the climate change agenda and act as exemplars, and make the case for adequate funding

Actions for Protected Areas

- Ensure Management Plans are climate change proofed and include a long term perspective
- Demonstrate relevance and the ability to deliver on the climate change agenda
- Put own house in order. Carbon footprint the organisation's own activities – energy conservation, green travel plans
- Introduce monitoring arrangements on climate change impacts
- Develop strategies for climate change adaptation and mitigation – habitat defragmentation, work on carbon sinks
- Use National Park Authority land to demonstrate good practice
- Develop public awareness programmes with local communities and visitors and exploit education opportunities through visitor centres
- Demonstrate that renewable energy technologies can be adopted sensitively in protected areas and promote uptake
- Produce guidance on sustainable construction in protected areas and emphasise energy efficiency
- Exploit opportunities for biofuels, particularly woodfuel which can help get unmanaged woodland back into management with wider conservation benefits
- Do more to promote sustainable tourism/sustainable transport, making the link with climate change
- Aim for National Parks and AONBs to be carbon neutral
- Develop carbon offsetting opportunities
- Encourage take up of ideas in the wider countryside (protected areas as greenprints)
- Do more to “sell” our work. Be bold. We have a good story to tell!

