



Adapting to Climate Change in the Lake District National Park:

Update and forward strategy, November 2014

Summary

In January 2012 the Lake District National Park Authority published its first climate change adaptation risk assessment, following the invitation from Defra to contribute to the UK-wide climate change risk assessment, a process established in the 2008 Climate Change Act.

The report can be found here:

http://www.lakedistrict.gov.uk/_data/assets/pdf_file/0016/233611/Climate-Change-Adaptation-Report-20-Jan-2012.pdf

This report:

- Provides an update on evidence and progress since January 2012;
- Details the links to our strategy for climate change mitigation through carbon reduction; and
- Explains how we will organise our work on climate change adaptation for the year ahead.

Update

The attached table details our current and planned work on climate adaptation. We have made significant progress since our report in 2012, as the table shows. Most of our work in this area is done collaboratively, and managed through the Lake District National Park Partnership (<http://www.lakedistrict.gov.uk/aboutus/partnership>). Highlights include:

Climate adaptation and community resilience through valley planning: A project was undertaken in 2013, with Defra funding, to look at climate change and community resilience. This links to the wider process of 'valley planning' for the National Park. Valley planning sets out what people want to see happening in their area in the future. It is a geographical approach to partnership working to improve delivery of community aspirations.

A pilot Valley Planning process was carried out in the Ullswater Valley in 2013, and as part of this, we worked with the community to look at community resilience in the face of

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climate change. Further information on the project is available at the link below. Following the pilot, we will be continuing work in Ullswater and undertaking a Valley Planning process for Grasmere/Rydal/Ambleside.

<http://www.lakedistrict.gov.uk/caringfor/projects/valleyplanning/ullswatervalleyplanning>

Resilient Rights of Way: Following severe floods in 2009, we implemented a three-year 'Paths for the Public' plan to increase the future flood resilience of paths. As part of this, we carried out repairs or replacements on 253 bridges, repaired or replaced gates, stiles and signs on 70 paths, and restored a further 85 paths. We have also continued with our Fix the Fells upland path restoration programme. Work has already been completed on 220 paths, and a further 120 will be restored. There is clear evidence of faster deterioration due to more extreme weather events.

Sustainable Water Management: We have new programmes in place to promote water quality, including the 'Greener Boating' initiative for boat users, and the development of a Lakes ScoreCard to focus work on water quality. We are working in partnership to prevent the spread of invasive species by lake users, through the 'Ditch the Hitchers – check, clean, dry' campaign. We are also undertaking catchment management and practical works in river corridors and uplands to slow down flood waters and reduce sedimentation.

Biodiversity: The LDNP is working closely with the new Local Nature Partnership, to implement integrated landscape-scale approaches to safeguarding biodiversity. Projects are already underway to conserve arctic-alpine species most at risk from climate change.

Cumbria Peat Partnership: This partnership was established to co-ordinate work on peatland restoration. It has a target to restore 150ha of peatland habitat by 2016, and to secure funding for further work.

Business continuity and resilience: We continue to improve our own performance in this area, notably with the completion of our new Northern Area Office which includes adaptive measures such as raised electrics and vinyl flooring and coving. Properties in high flood risk areas have been retrofitted with adaptive measures.

Links to climate change mitigation and carbon reduction

Our work on adaptation is part of our wider Low-carbon Lake District Initiative, which provides a strategic response to climate change across the Lake District. We work through the Lake District National Park Partnership, and convene a Climate Change Subgroup, with representatives from public sector agencies, the voluntary and community sector and business representatives.

Our mitigation work is based around a 'local carbon budget', the first of its kind in the UK, which allows us to measure carbon emissions and map progress toward an area-wide carbon reduction target. More details of this work are here:

<http://www.lakedistrict.gov.uk/caringfor/partnership/carbonbudget>

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Many carbon saving projects also have significant benefits for adaptation. For example, our pioneering 'carbon brokering' service rewards land managers for woodland creation and peatland restoration, which save carbon and improve resilience.

Future work

The attached table provides updated detail on current, planned or potential actions across the seven themes of the climate change risk assessment. Our workplan for climate adaptation and mitigation is integrated within the Partnership Plan, the strategic plan for the Lake District National Park Partnership.

Specifically, the Climate Change Subgroup, described above, plays a role in co-ordinating our strategic response to climate change.

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Lake District National Park Adaptation Risk Assessments

A simplified version of the completed ENPAA CCWG Climate Change Risk Assessment spreadsheets has been incorporated into this report. The scores were obtained by using this detailed matrix to assess the combination of likelihood and impact which was summarised to low medium or high impact as below.

Figure 6: Detailed Risk/Opportunity Matrix

Risk	-5	Catastrophic	-5	-10	-15	-20	-25
	-4	Major	-4	-8	-12	-16	-20
	-3	Moderate	-3	-6	-9	-12	-15
	-2	Minor	-2	-4	-6	-8	-10
	-1	Slight	-1	-2	-3	-4	-5
	0	No Change	0	0	0	0	0
Opportunity	1	Slight	1	2	3	4	5
	2	Minor	2	4	6	8	10
	3	Moderate	3	6	9	12	15
	4	Major	4	8	12	16	20
	5	Fantastic	5	10	15	20	25
			Rate	Unlikely	Possible	Likely	Almost certain
			1	2	3	4	5
			Likelihood				

Figure 7: Summary Risk/Opportunity Matrix

Risk/Opportunity Assessment Score (+/-)	Level of Impact	
1-6	Low	
7-15	Medium	
16-25	High	

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8.1 Access, recreation and tourism

Potential Impact (risk/opportunity)	Risk/Opportunity rating			Current, planned or potential actions
	2020s	2050s	2080s	
Risk: Increased frequency of wild fires on fells leading to access restrictions				<p>Completed: Assess need to restrict areas of moorland due to fire risk. Identified no present need for restrictions to statutory open access land designated under CROW Act.</p> <p>Current: Cumbria Wildfire Group assists others to create fire plans for certain vulnerable sites, procure fire fighting equipment and train partner staff.</p> <p>Planned: Further public awareness raising, training and fire plans for private landowners</p>
Risk: Warmer, wetter winters leading to less accessible areas due to wetter ground, higher lake and river levels and greater vegetation growth				<p>Completed: Following the 2009 floods, the 3-year 'Paths for the Public' programme repaired or replaced rights of way furniture (gates, stiles and signs) on 70 paths; repaired or replaced 253 rights of way bridges and restored 85 paths. The work increased future flood resilience of paths worked on, and took the opportunity to increase user benefits.</p> <p>Planned: Investigate use of volunteers to conduct prioritised clearance following rights of way surveys.</p>
Risk: Damage to public access and transport infrastructure by extreme weather events, particularly floods, damage to public perception of area, safety of staff and public				<p>Completed: Paths for the Public repairing and restoring paths and bridges, as above and increasing future flood resilience. Lessons learned from November 2009 floods.</p> <p>Current: Fix the Fells upland path restoration programme. 15 year programme which will undertake new work on a further 120 paths. Work already completed on 220 paths. Evidence seen of faster deterioration due to more extreme weather events. Current adaptation to increase maintenance, repair and enhancement works on existing 220 paths worked on. Planned: Work with media to promote on going opportunities for visitors. Consideration of building in resilience capacity when undertaking maintenance works.</p>
Risk: Loss of coastal rights of way and recreation infrastructure due to sea level rise				<p>Planned: Identify vulnerable routes and negotiate with landowners. Develop protocol for erecting warning signs when routes are lost or damaged.</p>

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				<p>Planned: Cumbria is a pilot area for coastal access. New routes are being walked and decided, led by Cumbria County Council. The potential routes are being considered as wide bands of access rather than a narrow definitive line which may be lost due to coastal erosion and/or sea level rise.</p>
<p>Opportunity: Increased opportunities for visitor businesses due to longer, warmer visitor season, especially water-based businesses.</p>				<p>Completed: Paths for the Public programme allowed for path surface and gradient improvements - particularly at bridges previously accessed via steps - improving access for those with limited mobility.</p> <p>Completed: Production of a "Swim Safe Boat Safe" Code and leaflet promoting safe swimming.</p> <p>Current: Implementing Access to lakes, rivers and coast strategy.</p> <p>Provision of countryside access improvements that meet wider social goals.</p> <p>Planned: Develop a project plan to improve Bowness Bay and the Glebe</p>
<p>Risk: Loss of winter conditions for winter sports affecting winter visitor numbers and spend</p>				<p>Current: Provision of winter weather and climbing condition information – Weatherline and Fell Top assessors.</p> <p>Current: White Guide for Winter published by Mountaineering Liaison Group – raising awareness of suitable conditions</p>
<p>Risk: Increased low and high river and lake levels, poor water quality incidents damaging water recreation opportunities</p>				<p>Current: "Greener Boating" initiative encouraging boat users to help reduce pressures on water quality.</p> <p>Current: Cumbria Freshwater Invasive Non-Native Species Initiative promoting "Ditch the hitchers – check, clean, dry" to prevent spread of invasive species by lake users.</p> <p>Current: Wide scale promotion of algal blooms when they occur</p> <p>Current: Catchment-scale projects led by partners and communities to improve water quality and moderate flows.</p> <p>Completed: Development of a Lakes Score Card to help focus work on water quality.</p> <p>Planned: Development of landscape-scale management framework and actions that consider – environmental, social and economic aspects and prioritises activities to provide multiple benefits.</p>

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8.2 Biodiversity

Potential Impact (risk/opportunity)	Risk/Opportunity rating			Current, planned or potential actions
	2020s	2050s	2080s	
Risk: Changes in distribution and balance of species (flora and fauna), leading to change in habitat composition and condition due to higher year-round average temperatures and more extreme rainfall patterns. Risk of some species extinctions (e.g. montane heath and arctic alpiners) leading to conservation objectives for some SSSI designations unlikely to be achieved. Species immigration may bring opportunities or risks of invasion. Loss of synchronisation between interdependent species.				<p>Current: Arctic Alpine conservation project.</p> <p>Current: Agri-environment schemes encouraging sustainable land management.</p> <p>Current: Identified priority for montane habitats and lakes and tarns, including arctic-alpine species and glacial relict fish species (e.g. Arctic Charr and Vendace) to survive as long as possible. Planned: Develop resilient habitat networks through strategic projects and agri-environment schemes.</p> <p>Planned: Adopt a shared intention with the Cumbria Local Nature Partnership and LDNP Partnership for integrated landscape scale approaches to safeguard biodiversity and that by 2020, 90% of Priority Habitats will be in favourable or recovering condition; 50% of SSSIs will be in favourable condition; 95% of SSSIs will be in favourable or recovering condition.</p> <p>Planned: Up to 2020, annually agreed contribution to a programme of activity designed to increase the extent of priority habitat – potential to increase habitat resilience and connectivity.</p> <p>Planned: Up to 2020, annually agreed resource contributed to partnership projects which benefit Priority Species identified as most in need of special management. Potential: Site, species and habitat research to understand tolerance levels, likely impacts and review and revise policies, strategies and management plans.</p>
Risk: Loss of veteran trees to storm damage and pests and diseases				<p>Planned: agree a partnership approach to disease management for larch and ash (highest risk species) in the Lake District</p> <p>Planned: pilot project to increase management of undermanaged woods</p> <p>Potential: Manage good age structure of trees and maintain veteran trees in sheltered sites</p>
Risk: Coastal squeeze on coastal habitats and species (e.g. Natterjack Toad sites)				<p>Potential: Identify vulnerable sites and habitats and investigate options for compensatory habitat creation</p>

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<p>Risk: Increase in pests and diseases affecting flora and fauna species and habitat condition</p>				<p>Current: Cumbria Freshwater Invasive Non-Native Species (FINNS) Strategy. Current: Forestry Commission monitoring of phytophthora ramorum (on larch); phytophthora austrocedrae (on juniper) and chalara fraxinea (on ash). Current: agreeing a partnership approach to disease management for larch, juniper and ash (highest risk species) in the Lake District Current: established a Cumbria Tree Health Group Current: Developing a North West England Ash Working Group</p>
<p>Risk and opportunity: Increased peak flows and droughts in rivers damaging species (e.g. freshwater pearl mussel and habitats) and creating new habitats (e.g. through river naturalisation).</p>				<p>Current: Valley planning in Ullswater and Borrowdale is exploring future options for river management Current: Pearls in Peril project – securing the long-term survival of existing populations of freshwater pearl mussels</p>
<p>Risk: Lower river flows and lake and tarn levels will result in concentration of pollutants and higher water temperatures in summer leading to impacts on species such as salmon, arctic charr and vendace. Indirect effect of requests to dredge to maintain boathouse and jetty access, impacting lake bed and marginal vegetation and fish spawning grounds.</p>				<p>Current: Catchment projects in Bassenthwaite and Windermere catchments to improve water quality and moderate flows. Species ark projects to protect populations of vulnerable species Potential: Consideration in boathouse/jetty design/planning to accommodate greater fluctuation of water levels. Riverside planting schemes to increase shade and lower water temperature.</p>
<p>Risk: High rainfall leading to higher soil erosion and surface run-off as well as wash out from polluted mines; all leading to higher sedimentation and pollution inputs into rivers and lakes affecting species</p>				<p>Current: Catchment projects in Bassenthwaite and Windermere catchments to improve water quality and moderate flows. Current: Willow spiling work to reinforce riverbanks and reduce erosion ongoing Planned: sustainable drainage systems</p>
<p>Opportunity: Limit of the tree-line will increase in altitude, providing opportunities for woodland creation schemes.</p>				<p>Potential: woodland creation schemes</p>
<p>Risk: Drying out of peat due to higher summer temperatures and less rainfall, leading to increased tree colonisation, exacerbating drying and trend toward unfavourable condition of peat habitat. Greater management resources required.</p>				<p>Current: Wetland restoration works to increase resilience to drying out Planned: Cumbria Peat Partnership target to restore 150ha of peatland habitat by 2016 and secure funding for a further 300ha of upland peat restoration and 50ha of lowland peat restoration Potential: Monitoring and removal of tree colonisation</p>
<p>Risk: Lowland bogs at risk of change from freshwater to saline system as a result of sea level rise</p>				<p>No defined actions at this stage</p>

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8.3 Community, culture and economy

Potential Impact (risk/opportunity)	Risk/Opportunity rating			Current, planned or potential actions
	2020s	2050s	2080s	
Risk: Demand for retro-fitting of existing building stock with micro renewable infrastructure, air-conditioning, insulation, water storage and other building adaptations. Practical and design aesthetic challenges				Current: Low carbon cottages programme to research and disseminate best practice on traditional historic building stock. Potential: Identify demonstrations of best practice with developers and communities.
Opportunity: new build with innovative design, including climate adaptations				Potential: Identify demonstrations of best practice with developers and communities.
Risk: Flooding and other storm damage to built environment causing disruption to businesses, increased insurance costs, disruption to community life				Completed: Flood emergency plans developed for Glenridding and Patterdale Potential: Work with business sector to raise awareness of risks and adaptive options.
Risk: Long term sea level rise, coastal erosion and storm surges disrupting coastal communities				Current: The St Bees Head to Earnse Point Shoreline Management Plan includes the coastal area in the National Park. It sets out the management objectives and the strategic coastal defences for the coastal region.
Opportunity: Increased visitor numbers over warmer, drier, longer summer season increasing visitor spend				Current: We are working closely with our partners in the tourism sector to maximise and manage this opportunity through our function as the planning and development management authority and in promoting sustainable tourism and the Low-carbon Lake District™.
Opportunity and risk: increase solar energy potential in summer, hydro in winter, but more extreme conditions limiting year round use of either				Current: Our adopted Local Development Framework Core Strategy includes CS16 which aims to increase the proportion of energy generated through renewable and low carbon sources. We offer energy saving and renewables advice from the Energy Saving Trust to planning applicants
Risk: Increased interruptions to grid power supplies due to storm events				No defined actions at this stage

8.4 Historic environment

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Potential Impact (risk/opportunity)	Risk/Opportunity rating			Current, planned or potential actions
	2020s	2050s	2080s	
Risk: Increased dampness and condensation in historic buildings resulting in increasing damage; costs of maintenance and repair; pressure for intrusive changes risking historic character and historic integrity and potential health risk for occupants.				Current: Low carbon cottages programme to research and disseminate best practice on traditional historic building stock. Potential: make owners aware of best practice for maintaining buildings and identify opportunities for increasing available resources. Awareness campaign for high risk properties.
Opportunity: Reduced levels of freeze-thaw damage to historic buildings				No defined actions at this stage
Risk: Increased rainfall causing water damage to structural fabric of historic buildings (e.g. deterioration of traditional building mortars) and overwhelming rainwater goods. Risk of loss of historic character and integrity. Extreme events pose risk of severe damage to historic settlements and difficulty of insurance.				Current: Regular formal inspection and maintenance of listed features and National Park owned buildings (cost implications). Potential: make owners aware of best practice for maintaining buildings and identify opportunities for increasing available resources.
Risk: Increased UV-light on building materials increasing rate of deterioration and need for renovation work.				Potential: Provide guidance on best practice for treatment of UV sensitive materials, may require investigation.
Risk: Long term sea level rise and short term storm surges damaging historic buildings and archaeological features Opportunity: to increase archaeological knowledge through excavation as part of mitigation strategy (additional resources required to carry out).				Current: Romans in Ravenglass Project includes excavations and documenting of previous coastal finds which will increase archaeological knowledge of the historic Roman settlement – aspects of which are already subject to coastal erosion. Project will also encourage recording of future finds by community groups. Potential: identify vulnerable buildings and likely timescales and plan adaptation actions

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Risk: Greater drying and wetting of soil causing damage due to higher water table and erosion of features. Risk of subsidence in dry periods. Stonework decay accelerated.				Potential: Raising awareness with owners and contractors. Encouraging use of traditional materials and techniques for repair.
Risk: Increased growth rates of vegetation e.g. bracken damaging buried archaeology and visibility of sites				Current: volunteering programme in place for vegetation clearance on historic features at risk.
Risk: Flood damage to historic mines and increased water erosion of archaeological features. Risk of disruption to buried sediments and damage to earthworks.				No defined actions at this stage
Risk: Storm damage, drier summers and diseases and pests hindering the maintenance of historic parks and gardens				No defined actions at this stage
Risk: Increase in pests and diseases poses a greater risk to historic fabrics and collections.				No defined actions at this stage
Risk of drier summers resulting in peat shrinkage, damaging paleo-environmental and archaeological deposits. Potential loss of vegetation leading to erosion and damage to archaeological deposits. Increased risk of wildfires potentially affecting archaeological and listed features in susceptible areas.				Planned: Cumbria Peat Partnership target to restore 150ha of peatland habitat by 2016 and secure funding for a further 300ha of upland peat restoration and 50ha of lowland peat restoration Potential: Include information on archaeology and listed features in emergency planning.
Risk: Changes in land management patterns affecting buried archaeological sites, traditional farm buildings and historic landscape				No defined actions at this stage

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8.5 Farming and Land Management

Potential Impact (risk/opportunity)	Risk/Opportunity rating			Current, planned or potential actions
	2020s	2050s	2080s	
Risk: Increased frequency and severity of wildfires removing grazing value of fell and posing risk to livestock, impacting on farm businesses. Carbon storage also affected.				Completed: Assess need to restrict areas of moorland due to fire risk. Identified no present need for restrictions to statutory open access land designated under CRow Act. Potential: increase fire breaks, water storage near high risk sites and fire training for staff
Risk: Lower soil moisture and periods of drought can slow growth rates and lower crop yields/quality. This may affect timing of agricultural practices; increase the need to buy-in feed and impact market prices. Poorer quality diet affects productivity and increases enteric emissions (methane). Drier soils increase vulnerability to erosion potentially leading to water contamination and reduced reservoir storage (silting up). Peat soils risk loss of anaerobic conditions, degrading habitat and affecting carbon store.				Current: Regular ground-water testing. Potential: Upgrade water storage and distribution systems and reduce water loss from cracked pipes. Develop soil conservation training for land managers. Greater use of natural windbreaks where appropriate to reduce soil erosion.
Risk: Higher temperatures and periods of drought increase stress on livestock, particularly hill breeds. Supplementary water supply and creation of additional shade may be required. Heat/drought tolerances need to be introduced into breeding – opportunity to introduce new breeds. Area of viable grazing land could be reduced due to insufficient water supply, particularly areas already susceptible to drought e.g. limestone				Potential: Upgrade water storage and distribution systems.
Opportunity: Increased mean annual soil temperatures provide a longer growing season, and opportunities for new crops. A potentially longer grazing season reduces period of housing and associated feed/bedding costs and slurry storage. Risk: This could lead to inappropriate grazing and/or				No defined actions at this stage

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increased poaching of soils.				
Risk: More days of saturated soil and flooded land results in loss of grazing land and need for reduction in stocking rate or longer housing period; supplementary feeding and associated costs. It can also increase livestock health problems requiring greater levels of animal husbandry; increase poaching of soil and the anaerobic conditions and compaction may affect soil quality. Vehicular access to fields, remote farm buildings, crops and livestock may become more difficult, affecting ability to operate farm business effectively, or result in soil erosion and rutting.				Potential: Landowners to maintain drainage infrastructure and to continually move water/feeding areas within fields.
Risk: Recovery time needed after flooding events which can cause: accelerated soil erosion; deposition of silt/gravel; damage to tracks/boundaries; long-term reduced access as C-roads are lower priority for repair; and loss of yield/livestock.				Potential: Landowners to maintain drainage infrastructure
Risk: Adverse weather and increased rainfall may result in higher lamb mortality, associated costs of increasing provision of livestock shelter and poses a risk to existing farm buildings. More rainfall increases risk of effluent entering water course and removal of topsoil and nutrients.				No defined actions at this stage
Risk: Greater extremes of wetting and drying may affect wall foundations, with a risk of needing additional maintenance.				No defined actions at this stage
Risk: Increase in wet ground and lack of prolonged cold temperatures leading to increase in new and existing pests and diseases for plants, trees and livestock. Risk of enhanced transport by surface water flow. Risk to animal welfare; possible restrictions on livestock movement and time/cost of medication application. Implications on water pollution (e.g. potential increase in sheep dipping).				Current: Forestry Commission monitoring of phytophthora ramorum (on larch); phytophthora austrocedrae (on juniper) and chalara fraxinea (on ash). Current: agreeing a partnership approach to disease management for larch, juniper and ash (highest risk species) in the Lake District Current: established a Cumbria Tree Health Group Current: Developing a North West England Ash Working Group

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Risk of tree loss, and change in structure/composition of woodlands.				
Risk of change in structure/species composition of woodlands. Water stress may result in tree loss/damage and affect establishment of new planting. Adverse weather increases likelihood of wind-blow and storm damage. Phenology changes expected (date of bud break etc). Extremes of wetting and drying may lead to greater uprooting of trees.				Planned: pilot project to increase management of undermanaged woods Potential: Greater consideration by woodland managers for wind-blow. Future planting needs to consider tolerant species. Increase and improve woodland management. Increase planting rates in advance of more difficult conditions.
Risk: Changes in agricultural practices may be required (e.g. timing of growth, cutting, grazing regime) which could impact specified dates in agri-environment agreements. Changes in weed management may be needed to deal with species competition.				No defined actions at this stage

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8.6 Landscape

Potential Impact (risk/opportunity)	Risk/Opportunity rating			Current, planned or potential actions
	2020s	2050s	2080s	
Risk and opportunity: extreme flood events leading to landslips, gully erosion and river re-naturalisation changing landscape				Current: Valley planning in Ullswater and Borrowdale is exploring future options for river management Potential: Identify vulnerable sites and agree mitigation or pre-emptive action to minimise disruption of process.
Risk: Sea level rise and storm surges changing coastal features and landscapes (e.g. dune systems and salt marshes) which may also be under stress due to changes in river flow from drier summers/wetter winters.				Current: Coastal management plans to agree aims and actions.
Risk: Increase in frequency and severity of wildfires damaging amenity value of fells and woodlands				Completed: Assess need to restrict areas of moorland due to fire risk. Identified no present need for restrictions to statutory open access land designated under CRoW Act. Potential: increase fire breaks, water storage near high risk sites and fire training for staff
Risk: Drought, pests and diseases, storm events all changing woodland composition, structure and limiting new planting				Current: Forestry Commission monitoring of phytophthora ramorum (on larch); phytophthora austrocedrae (on juniper) and chalara fraxinea (on ash). Current: agreeing a partnership approach to disease management for larch, juniper and ash (highest risk species) in the Lake District Current: established a Cumbria Tree Health Group Current: Developing a North West England Ash Working Group Planned: pilot project to increase management of undermanaged woods Potential: Increase and improve woodland management. Increase planting rates in advance of more difficult conditions.
Risk: Reduced rainfall causing potential stress to and loss of vegetation; soil loss through windblow and increase in sedimentation elsewhere. Changes to vegetation distribution and abundance (including risk of invasive species) as a result of changes in temperature and rainfall.				Current: Catchment-scale projects led by partners and communities to improve water quality and moderate flows. South Cumbria Rivers Trust non-native invasive species management. Planned: Development of landscape-scale management framework and actions that consider – environmental, social and economic aspects and prioritises activities to provide multiple benefits.

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Risk: Increase in altitudinal limit of tree-line leading to potential loss of open fell and change of character.				No defined actions at this stage
Risk: Visual impact of lower summer water levels of lakes and tarns; reservoir drawdown and potential algal blooms				No defined actions at this stage
Risk: Landscape character areas which are dependant on peat are at risk where peat is likely to dry out. Similarly lowland bogs at risk from sea level rise.				Planned: Cumbria Peat Partnership target to restore 150ha of peatland habitat by 2016 and secure funding for a further 300ha of upland peat restoration and 50ha of lowland peat restoration

8.7 National Park Authority Business Continuity

Potential Impact (risk/opportunity)	Risk/Opportunity rating			Current, planned or potential actions
	2020s	2050s	2080s	
Risk: Wildfire damage to NPA properties, in particular woodlands and common land damaging environmental, access and economic value				Completed: Assess need to restrict areas of moorland due to fire risk. Identified no present need for restrictions to statutory open access land designated under CRoW Act. Potential: increase fire breaks, water storage near high risk sites and fire training for staff. Review insurance.
Risk: Flood damage to NPA buildings and operational sites damaging assets, raising insurance costs and reducing commercial value and service to the public				Completed: New build office & workshop includes adaptive measures such as raised electrics and vinyl flooring and coving. Properties in high flood risk areas also retrofitted to include adaptive measures, Planned: All property refurbishments to include adaptive measures where appropriate. Potential: Avoid building in high risk areas. Update procurement toolkit to ensure new build projects take flood risk into account
Risk: Disruption to travel to work due to flooding, storm damage increasing staff absenteeism from workplace, reducing services and delaying project delivery				Current: Infrastructure in place for staff to work from home. Potential: Expand potential for home working to all staff.
Opportunity: reduction in heating requirements for properties, reducing energy bills.				Completed: Installed biomass boiler at Head Office and biomass and solar PV at new build office and workshop Current: Continue to monitor and review heat and power demands of

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				<p>workplaces and predict future changes Planned: Continue to invest in renewable energy across our property portfolio</p>
<p>Risk: Extreme weather events, potential damage to estate health and safety impacts on staff and public</p>				<p>Current: Site closure procedures in place for key sites. Potential: Consider extending and adding to existing health and safety audits</p>