


# YORKSHIRE AND HUMBER CLIMATE CHANGE ADAPTATION STUDY

## LOCAL AREA REPORT RYEDALE DISTRICT

<p><b>Location</b></p>	
<p><b>Description of District</b></p>	<p>Ryedale is a rural district with the North York Moors in the north and the Yorkshire Wolds to the south. It is dominated by agriculture.</p>
<p><b>Future Climate Projections</b></p>	<p>The results of the modelling carried out for the Yorkshire and Humber Regional Climate Change Adaptation Study suggest that the following changes are likely by 2050:</p> <ul style="list-style-type: none"> <li>• Ryedale summer average temperatures will increase by 2.2°C;</li> <li>• The long term average annual minimum temperature will increase by 1.5°C;</li> <li>• Summer rainfall rates will fall by up to 23% (16mm), although winter rainfall rates will increase by 16%;</li> <li>• Winter average wind speeds to increase marginally; and</li> <li>• There will be more than 30 fewer frost days per year, on average</li> </ul> <p>These figures relate to the nearest modelled cell, which was Rosedale Abbey.</p>

## Key Impacts and Adaptation Actions

Although principally a regional / sub-regional study, there are a range of issues that are of particular relevance to the Ryedale District. These are set out below, using the same 'sector' headings as the main report. These points are not the only issues for consideration, however, and should not be read in isolation. Sub-regional and regional reports, as well as the thematic or sectoral areas of the website, do cover other issues relevant to this local authority area.

### Flooding

#### *Key Impacts*

- Greater flood risk (fluvial, sewer/drainage, and from direct surface runoff) due to faster flood flows from the North York Moors with increasing seasonality of rainfall bringing higher intensity, flashy flood flows, particularly during the summer months;
- More frequent breaching of historic defences requiring increased maintenance;
- Traffic impacts on main routes affecting local and national businesses, and the co-ordination of emergency services and critical council services; and
- Increased risk to highly vulnerable caravan parks and camping sites.

#### *Key Adaptations*

- Concentrate flood management on protecting local properties. Consider a wide range of small-scale flood reduction methods as well as major flood defence schemes;
- Look for more innovative sustainable flood management approaches rather than traditional flood defences, such as allowing the upstream storage of flood water. Use changes in local land management in rural areas to reduce rates of surface runoff, and consider the downstream benefits of washland areas rather than maintaining upstream defences; and
- Ensure appropriate planning regulation is undertaken for caravan and camping parks with increased tourism as sites are highly vulnerable and are often placed adjacent to watercourses.

### Groundwater and Minewater

#### *Key Impacts*

- Risk to the Corallian Limestone groundwater resource due to declining groundwater levels and increased drought; and
- Impact on river flows, particularly the River Derwent, due to a reduction in spring flow from the Corallian Limestone

### *Key Adaptations*

- Continued monitoring and careful exploitation of the Corallian Limestone aquifer, accounting for habitat needs and water resource implications.

## **Business and Economy**

### *Key Impacts*

- Changing temperature and water regimes will affect woodland and forestry, with impacts on both yield and the viability of species. Damage and economic impacts to woodlands through increased storminess is also likely to be a concern; and
- Increases in pest and disease spread, together with the potential for more 'exotic' species and increased vulnerability of crops and livestock, are likely to have significant effects on the district's agriculture.

### *Key Adaptations*

- There will be opportunities for agricultural and woodland diversification, exploiting the ability to grown new crops and benefit from wider incentives to produce food and non-food crops. There is also potential for expansion of woodland areas as part of wider catchment and flood management schemes in order to ameliorate downstream flood risk; and
- Initiate, develop and review pest management strategies, in particular in those rural areas frequented by visitors, to ensure the early identification and treatment of any species or conditions which may negatively affect the district's habitats or agriculture.

## **Public and Voluntary Services**

### *Key Impacts*

- With the North York Moors National Park within the council area, heightened summer temperatures and drier soil conditions could spark a noticeable increase in fires and an increased strain on the Fire and Rescue Service;
- While fuel poverty may decline during winter months, summer heat waves will make homes less comfortable, particularly for the elderly and vulnerable;
- With the expected increase in winter rainfall and extreme rainfall, flooding events will become increasingly frequent and intense, impacting on social housing residents, housing association, public services and emergency service ability to operate; and
- Lower summer rainfall and higher temperatures may need consideration in design and management of public open spaces, particularly regarding planting of suitable drought-tolerant species, water features, shading and grass cutting operations.

### *Key Adaptations*

- Emergency planning will need well developed communication links with the Armed Forces Units to prepare for supplementary resourcing when required;
- There are significant opportunities for housing refurbishment. Linked to those measures under the overarching adaptation measures is the refurbishment of housing stock in relation to energy efficiency, and to build in resilience;
- Climate change adaptation activity and refurbishment could start by using the index of multiple deprivation to identify priority areas and help take forward community scale NI 188 assessments; and
- Planning of greenspace and green infrastructure must take full account of future impacts climate change. This will need to consider species choice, management regimes, and future use of the spaces, and could be delivered through eg Local Strategic Partnerships.

### **Infrastructure and Utilities**

#### *Key Impacts*

- Surface melt of rural road surfaces and associated knock-on effects, such as disruption to travel and welfare provision;
- Increased demand on water resources, particularly from agriculture;
- Increased tourist and recreational use of North York Moors National Park, including increased pressure on rural road networks;
- Increased blockage of drains, culverts and gullies; and
- Mechanical operations within the water distribution grid could be affected by climate-related disruption to power supplies.

#### *Key Adaptations*

- Allow additional resources for use of alternative road surfacing materials in carriageway maintenance programs to ensure higher melt resistance;
- Farm-holdings to consider local winter water storage reservoirs to assist with summer irrigation or livestock watering;
- Plan for increased visitor numbers and provide additional public transport;
- Re-evaluate resources and approaches for inspection and clearance of drain, culvert and gully blockages; and
- Increased awareness of inter-dependencies between critical infrastructures, leading to improved resilience planning.

## Biodiversity

### *Key Impacts*

- Chalk and limestone grassland may be prone to further loss. These habitats are already vulnerable and sensitive to change and contain rare species. Changes in rainfall and temperature could increase pressure on species;
- Further shrinkage of wetland habitats and conversion from wet type to dry type may occur where the impact of hotter drier summers is particularly strongly felt; and
- Pressure will increase on wet woodland due to changes to hydrology and water quality, as well as increased water logging in winter and drought in summer.

### *Key Adaptations*

- Wherever possible allow natural processes to continue, and therefore adaptation to change to occur naturally;
- An overall expansion in habitat types currently suffering from isolation or fragmentation, to improve habitat permeability. The overall connectivity of existing and newly created habitats needs to be enhanced to enable species to migrate and disperse easily; and
- Maximise the potential for different habitats and species to help sustain each other. New habitats may take on functional roles such as buffering natural hazards such as wind, flooding and drought.

## Health and Welfare

### *Key Impacts*

- Greater risk of flooding with potential impacts on mental health; and
- Rising temperatures resulting in heat-induced mental and physical health problems.

### *Key Adaptations*

- Rainwater capture and harvesting and other flood preparedness work with vulnerable communities; and
- Ensure homes are able to maintain comfortable temperatures as external temperatures rise, and promote action through education, awareness, support and grants.