

INTRODUCTION

Why is the Severn Estuary special?

The Severn Estuary has the second highest tidal range in the world and has been a focus for human activity for many centuries. Its floodplains cover 50,000 hectares of land, provide a home for around a quarter of a million residents and contain £14 billion of important infrastructure.

This is set within a unique and internationally designated natural environment that has a very high level of protection under both European and UK law. The estuary also features the Severn bore, a natural phenomenon created by the tide and the natural funnel shape of the estuary basin.

Tidal flood risk affects the whole estuary. Wave action adds to the flood and erosion risk south of the Severn Bridges. Near Gloucester the greatest flood risk is caused by high fluvial flows.

The Environment Agency¹

Our principal aims are to protect and improve the environment, and to promote sustainable development. We play a central part in delivering the environmental priorities of central government through our functions and roles.

Finding effective ways to manage flood risk is a big part of our role. To do this we work closely with a wide range of partners including Government, businesses, local authorities, other agencies, civil society groups and the local communities.

We prioritise our investment in flood and coastal risk management works according to Government policy and guidance. We allocate public funds where they will provide the greatest reduction in flood risk in the most cost effective way.

More information on our role can be found in the background documents section. The 'Living on the Edge' booklet describes the roles of other key organisations that contribute to flood risk management as well as the role of riparian landowners.

Our role in putting together the Severn Estuary Flood Risk Management Strategy

The Government advises us to take a comprehensive, yet strategic, long term approach to flood risk management. Strategic consideration of the issues can lead to a much clearer definition of the problems and also help identify broader options for solutions. Flood Risk Management Strategies assist us in developing a sustainable long term plan to manage flood risk.

¹ From 1 April 2013, Natural Resources Wales took over the functions carried out by the Environment Agency Wales, the Countryside Council for Wales and Forestry Commission Wales and some functions of Welsh Government.

Why is the Strategy needed?

There are over 100,000 properties² currently at risk from the Severn Estuary in the 1% annual probability flood event. Also at risk of tidal flooding are 430 square kilometres of agricultural land, sections of motorway, A-roads and other roads, mainline and local line railways and railway stations, strategic power lines to South East Wales and power stations and many sub-stations, telephone exchanges, many schools and many holiday caravans.

The Severn Estuary is of international importance for nature conservation and is designated as one of Europe's most important wildlife habitats, forming part of the European Natura 2000 network.³ The UK Government has a statutory obligation under the Habitats Regulations (2010) to compensate for inter-tidal habitat lost through coastal squeeze.⁴ Compensatory habitat creation is an essential element in the future of sustainable flood risk management, enabling us to legally maintain or improve flood defences throughout the Severn Estuary.

Climate change means flood risk from the Severn Estuary will continue to increase in the future. The Strategy allows us to plan for change and justify long term investment of public funds towards flood risk management for properties, land, infrastructure and habitat.

What are the aims of the Strategy and what area does it cover?

The Strategy aims to assess flood risk and how it could be managed over the next 100 years, taking into account climate change and the deterioration of the existing flood defences.

We are at the beginning of the period the Strategy covers and ongoing collaboration between communities, local authorities and risk management authorities, such as the Environment Agency and Internal Drainage Boards, will be key to managing flood risk over the next 100 years.

The Strategy covers the coastline from Lavernock Point near Cardiff to Gloucester, and back down the coastline to Hinkley Point in Somerset. Flood risk in the estuary is primarily from the tide but in the more constrained channel of the upper estuary

² Within this Strategy properties are defined as residential dwellings, or buildings used for business purposes, such as offices and factories but not including agricultural buildings. This also does not include any land associated with the buildings or land without any buildings on it.

³ The Natura 2000 network is a collection of protected areas which are required under the European Union's Birds and Habitats Directives to protect the most seriously threatened habitats and species across Europe.

⁴ Coastal squeeze occurs when the flood defences prevent the estuary from naturally adjusting its shape and spreading outwards as sea levels rise.

there is also flooding risk from high flows in the River Severn. The assessments carried out in the Strategy take account of both influences.

Climate change and its impacts

The climate is changing. The rate of change and the rate that impacts of this change are seen cannot be predicted precisely, but we all need to start thinking about how we collectively respond to current and potential changes.

Climate change, when combined with movement of the earth's crust, means that sea level is currently rising at a rate of about 2.5mm a year in the Severn Estuary. This is predicted to increase through this century.

We have used information from the United Kingdom Climate Projections 2009 (UKCP09), the latest climate change projections for the UK, to give an indication of what may happen in the future. We are advised by government to plan for the change projected by the UKCP09 medium emissions scenario.

The UKCP09 medium emissions scenario projects a relative sea level rise of approximately 0.7m and an increase in river flow of 25% by 2110 as well as an increase in extreme rainfall intensity and potential for an increase in storm surge frequency and intensity.

Any changes to flood risk management will be based on actual climate change experienced rather than projections. Continued monitoring of river and sea levels will help measure the actual change.

Managing Flood Risk from the Severn Estuary

There are around 200 kilometres of existing flood defences along the Severn Estuary providing protection for many homes, businesses, agricultural land and infrastructure. All defences have a finite lifespan due to the wear and tear they suffer over time. The impacts of climate change and sea level rise are likely to reduce the lifespan of defences, as well as the standard of protection they provide.

In the Strategy we estimate the remaining life of the defences and also the impact of sea level rise on the standard of protection offered by the defences into the future. The information provided by the UKCP09 helps with this.

We have also estimated how long it may be before major investment is required to refurbish and/or improve defences. This has enabled us to predict how long it may be possible to continue to use public funding to contribute towards maintenance of defences or to making improvements to the defences. (See Supporting Information for further information on public funding and maintenance by the Environment Agency)

One effect of continuing to maintain and/or improve the defences on their existing line is that internationally important habitat is being lost as the sea level rises. Over

the next 20 years, depending on the amount of sea level rise that occurs, between 300 and 500 hectares of inter-tidal habitat is likely to be lost due to coastal squeeze. The lower amount is likely to be lost if sea level rise continues on the current trend; it will be closer to the upper amount if sea level rise accelerates.

One method of compensating for the loss of habitat from coastal squeeze is the managed realignment of defences. In locations where it is suitable these projects can involve construction of new, shorter defences, which provide protection for property, and some land outside the new defences is used for habitat creation. We are currently working with communities and landowners on managed realignment projects in the estuary which should provide most of the 300 hectares required to meet the amount of habitat predicted to be lost in the next 20 years with the current sea level rise trend. Managed realignment projects are only taken forward with the agreement of land and property owners. (See Supporting Information for further information on managed realignment)

Basing the assessments on projections of sea level rise helps in our understanding of potential changes to flood risk over time. Decisions on how flood risk can be managed are possible in the short term as we have sufficient understanding of current risk and how that might change in the near future. Decisions on how flood risk is managed for the medium and longer term will only be needed when the impacts of climate change have become more apparent. However starting to think about this now gives us all time to consider and plan for the possibility of increased flood risk and the possibility that the way flood risk is managed might have to change.

The Strategy is not 'set in stone' and is an adaptive document. Periodic reviews will consider if any factors that might affect the Strategy such as changes to funding policy and climate change projections have occurred and revisions will be made as required.

The location-specific pages within the consultation documents summarise our assessments and take account of input from the communities.