Environment Agency

Alt Crossens Catchment Flood Management Plan

Summary Report December 2009

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Published by:

Environment Agency
Richard Fairclough House
Knutsford Road
Warrington WA4 1HT
Tel: 0870 8506506
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

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Introduction

I am pleased to introduce our summary of the Alt Crossens Catchment Flood Management Plan (CFMP). This CFMP gives an overview of the flood risk in the Alt Crossens catchment and sets out our preferred plan for sustainable flood risk management over the next 50 to 100 years.

The Alt Crossens CFMP is one of 77 CFMPs for England and Wales. Through the CFMPs, we have assessed inland flood risk across all of England and Wales for the first time. The CFMP considers all types of inland flooding, from rivers, groundwater, surface water and tidal flooding, but not flooding directly from the sea (coastal flooding), which is covered by Shoreline Management Plans (SMPs). Our coverage of surface and groundwater is however limited due to a lack of available information.

The role of CFMPs is to establish flood risk management policies which will deliver sustainable flood risk management for the long term. This is essential if we are to make the right investment decisions for the future and to help prepare ourselves effectively for the impact of climate change. We will use CFMPs to help us target our limited resources where the risks are greatest.

This CFMP identifies flood risk management policies to assist all key decision makers in the catchment. It was produced through a wide consultation and appraisal process, however it is only the first step towards an integrated approach to Flood Risk Management. As we all work together to achieve our objectives, we must monitor and listen to each others progress, discuss what has been achieved and consider where we may need to review parts of the CFMP.

The Alt Crossens catchment has a history of flooding with Liverpool and Maghull most affected by past flood events. The main sources of risk are fluvial (from rivers), surface water, sewer flooding and from canals. Approximately 300 properties in the catchment have a 1% chance of flooding from rivers in any one year. The catchment is heavily reliant on two pumping stations to drain it, failure of these could put over 6000 properties at risk. The Alt Crossens catchment, being adjacent to the Sefton coastline, is also at risk of coastal flooding. As a result of climate change, we estimate that by 2100 approximately 405 properties will be at risk of fluvial flooding alone.

We cannot reduce flood risk on our own, we will therefore work closely with all our partners to improve the co-ordination of flood risk activities and agree the most effective way to management flood risk in the future. To develop this plan and ensure social, economic and environmental issues were taken into account we worked with, and consulted many organisations. These include local authorities, United Utilities, Natural England, Lancashire Wildlife Trust, the RSPB and farming representatives.

This is a summary of the main CFMP document, if you need to see the full document an electronic version can be obtained by emailing **enquiries@environment-agency.gov.uk** or alternatively paper copies can be viewed at any of our offices in North West Region.

Tony Dean
Regional Director

Contents

The purpose of a CFMP in managing flood risk

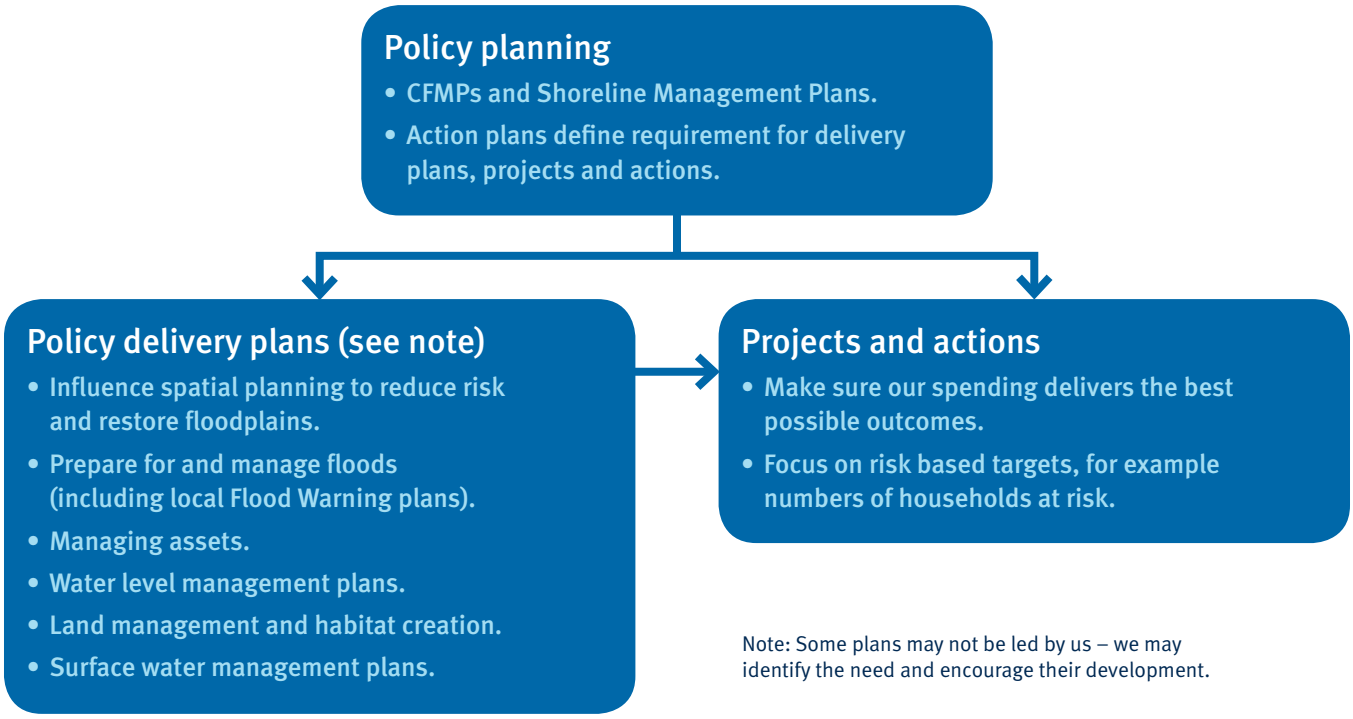
CFMPs help us to understand the scale and extent of flooding now and in the future, and set policies for managing flood risk within the catchment. CFMPs should be used to inform planning and decision making by key stakeholders such as:

- The Environment Agency, who will use the plan to guide decisions on investment in further plans, projects or actions.
- Regional planning bodies and local authorities who can use the plan to inform spatial planning activities and emergency planning.
- Internal Drainage Board, water companies and other utilities to help plan their activities in the wider context of the catchment.
- Transportation planners.
- Landowners, farmers and land managers who manage and operate land for agriculture, conservation and amenity purposes.
- The public and businesses to enhance their understanding of flood risk and how it will be managed.

CFMPs aim to promote more sustainable approaches to managing flood risk. The policies identified in the CFMP will be delivered through a combination of different approaches. Together with our partners, we will implement these approaches through a range of delivery plans, projects and actions.

The relationship between the CFMP, delivery plans, strategies, projects and actions is shown in figure 1.

Figure 1 The relationship between CFMPs, delivery plans, projects and actions



Note: Some plans may not be led by us – we may identify the need and encourage their development.

Catchment overview

The Alt Crossens area is low lying, with considerable areas of high grade farmland, and approximately 28% of the area is urbanised. The hydrology of the area is complex because much of the catchment is at or below sea level. Ultimately, heavy reliance is placed upon the two main pumping stations of Altmouth and Crossens to evacuate water from the Alt and Crossens catchments respectively. There is no capacity for gravity drainage from the Crossens catchment, although within the Alt catchment, there is some scope for gravity drainage during low tide at Altmouth.

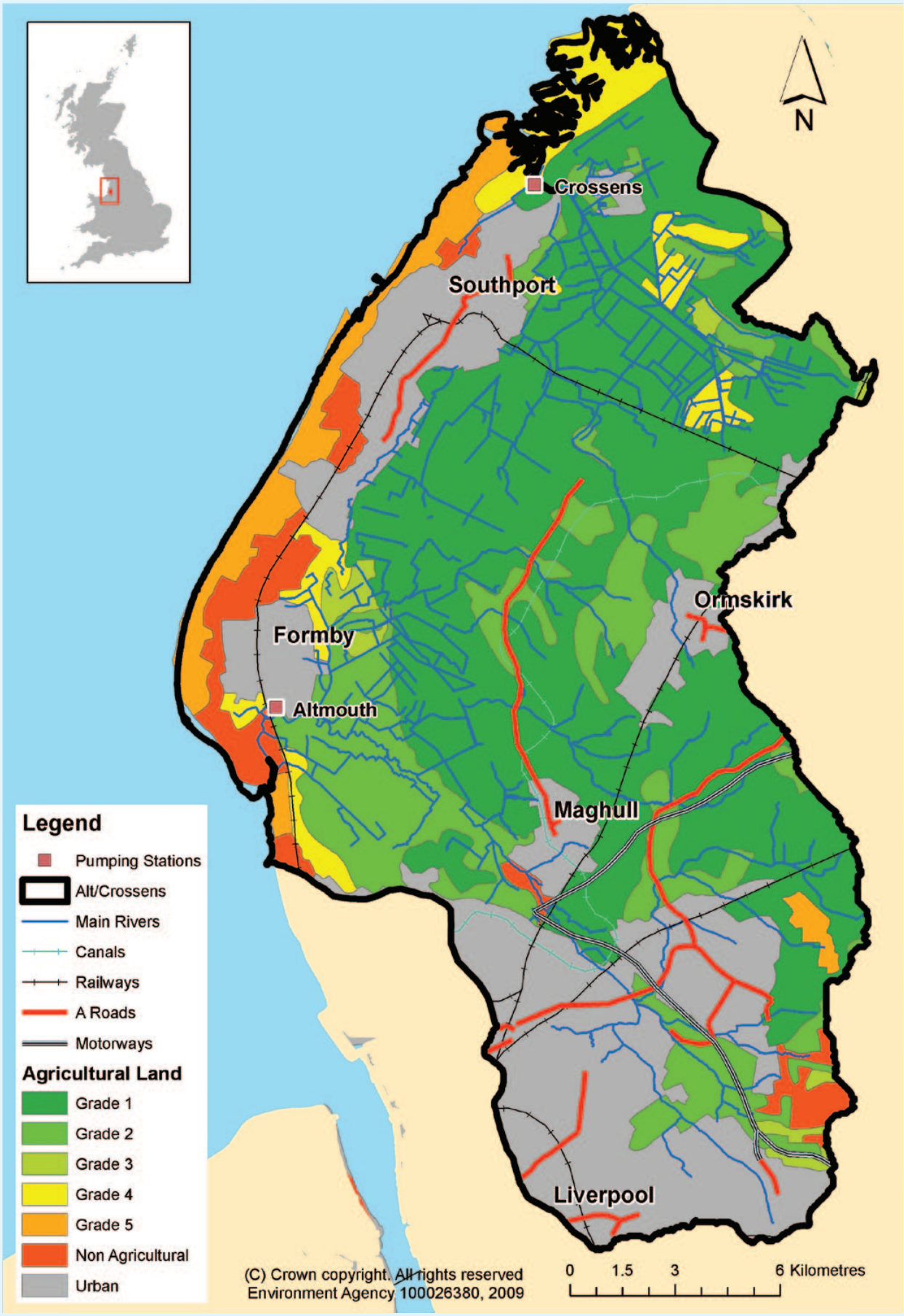
The upper part of the Alt catchment has a narrow floodplain, which widens significantly in the low lying agricultural areas downstream of Maghull, whilst the majority of the Crossens catchment has wide floodplains. The Lower Alt and Crossens catchments have been extensively developed for agricultural use. As a result, a large network of modified watercourses and embanked rivers has been created to support agricultural production. The modified channels act as arterial flow routes to a network of 11 satellite pumping stations and the two main pumping stations. Across the catchment, we need to help safeguard the rural floodplains, improve management of flood risk in the urban areas, and mitigate the impacts of climate change.

The key urban areas within the catchment comprise the north east quadrant of the City of Liverpool, and the coastal towns of Formby and Southport. Further inland are the populated areas of Ormskirk, Maghull and Kirkby. Agriculture within the study area has a significant role in the social and economic well-being of communities and to the region as a whole. Over 60% of all Grade 1 and 2 agricultural land in the North West of England is located in the catchment. There are approximately 300 properties across the catchment at risk from fluvial flooding during an event with a 1% chance of flooding in any one year. Approximately 50% of these properties are in Liverpool and a further 25% in Maghull. Our approach to management in these high risk locations is focussed around sustainable development, flood warning, flood resilience and the idea of making space for water, either locally or upstream.

The CFMP area is also important for nature conservation, and a number of nationally and internationally protected sites are within the floodplain. Depending on the location and nature of the designation, flooding can have a mixture of effects. For example, the Martin Mere Site of Special Scientific Interest (SSSI) is a managed wetland and changes to the current management regime may have positive or negative effects. The Alt and Crossens systems also flow into the Ribble and Alt Estuary Ramsar sites. However, the policies and actions from this CFMP will not significantly affect the ecological features of these protected sites. More generally, the CFMP includes actions to enhance the ecological value of the catchment.

↑ Altmouth Pumping Station

Map 1


N
Crossens
Southport
Ormskirk
Formby
Altmouth
Maghull
Liverpool
Legend
Pumping Stations
Alt/Crossens
Main Rivers
Canals
Railways
A Roads
Motorways
Agricultural Land
Grade 1
Grade 2
Grade 3
Grade 4
Grade 5
Non Agricultural
Urban
(C) Crown copyright. All rights reserved
Environment Agency 100026380, 2009
0 1.5 3 6 Kilometres

Current and future flood risk

Overview of the current flood risk

Flood risk has two components: the chance (probability) of a particular flood and the impact (or consequence) that the flood would have if it happened. The probability of a flood relates to the likelihood of a flood of that size occurring within a one year period, it is expressed as a percentage. For example, a 1% flood has a 1% chance or probability of occurring in any one year, and a 0.5% flood has a 0.5% chance or probability of occurring in any one year. The flood risks quoted in this report are those that take account of flood defences already in place.

In the Alt and Crossens catchments, since the installation of the Altmouth (1971) and Crossens (1961) pumping stations, reported flooding incidents are few and localised. The most serious flooding to date concerned canal infrastructure, affecting over 200 properties. Twenty newly developed properties were affected by flooding north of Ormskirk in 2004 from an ordinary watercourse although no water entered the property. There has been localised flooding at Whinney Brook in Maghull due to culvert capacity being exceeded. Cheshire lines brook breached twice in 2000 and once in 2008 and resulted in extensive flooding to farmland.

The main sources of flooding in the Alt Crossens catchment are as follows:

- River flooding incidents in recent times have been rare, and have mainly occurred from watercourses prior to them becoming part of the main river network and hence an Environment Agency responsibility. There are over 8km of culverted watercourses (main river in both the Alt and Crossens sub-catchments) which can potentially prove to be a significant source of flooding due to failure or blockage.
- There is tidal flood risk in the Alt Crossens catchment. Flood defences in the form of raised embankments extend along the coast and provide a 1% standard of protection. The main pumping stations also provide protection against tidal ingress. Tidal flooding and coastal processes will be assessed in the next stage of the Shoreline Management Plan (SMP) process, expected in summer 2010.
- Surface water flooding does occur in the Alt Crossens catchment, but is very localised. Based on information available it is thought to be high in frequency but low in consequence and is likely to occur in the urban areas with high rates of run-off. Much of the catchment is relatively flat with low drainage gradients which can lead to ponding after heavy rain. Wind blown sand in the north west of the catchment can cause blockages in the surface drains. Further work is required to better understand this type of flooding in the catchment.
- Sewer flooding has been recorded in the urban areas of Southport, Maghull and Liverpool. Discussions are underway with United Utilities and local authorities to identify and better understand this type of flooding.
- Groundwater flooding is not thought to be a significant issue on its own. However groundwater rise does occur within the lower Alt catchment. It is likely the groundwater table is near to the surface in winter and therefore the risk of local flooding may increase in probability during prolonged wet periods. No information is available for either the upper Alt or Crossens catchments.
- Canal flooding occurred from the Leeds and Liverpool canal in 1994 and flooded 200 to 300 properties. There is a potential risk of flooding where stretches of the canal are above ground level and pass through the urban areas of Burscough and Maghull.

What is at risk?

Using detailed hydraulic models we estimate 300 properties in the catchment have a 1% chance of flooding in any one year from rivers, nearly half of which are in Liverpool. There are 28,000 hectares of agricultural land in the Alt Crossens catchment, much of which is high grade, 2,100 hectares are at risk of flooding in a 1% event. There is one ecologically important site at flood risk in a 1% event and one scheduled ancient monument.

Where is the risk?

The catchment has a history of flooding with Liverpool and Maghull most affected by past fluvial flood events. Formby and Ormskirk have experienced fluvial flooding to a lesser degree. The distribution of flood risk to properties across the catchment is illustrated on the map overleaf. If the pumping stations were to fail or be removed, it is estimated that in the region of 6,700 properties could be at risk, this is an increase of several thousand properties compared to the current number at risk. The majority of these properties affected would be in Southport.

We recognise the potential risk from surface water and sewer flooding. Further studies, following on from the CFMP, will be undertaken to help quantify this potential risk.

Table 1. The areas with the highest concentration of properties at risk from river flooding are tabulated below:

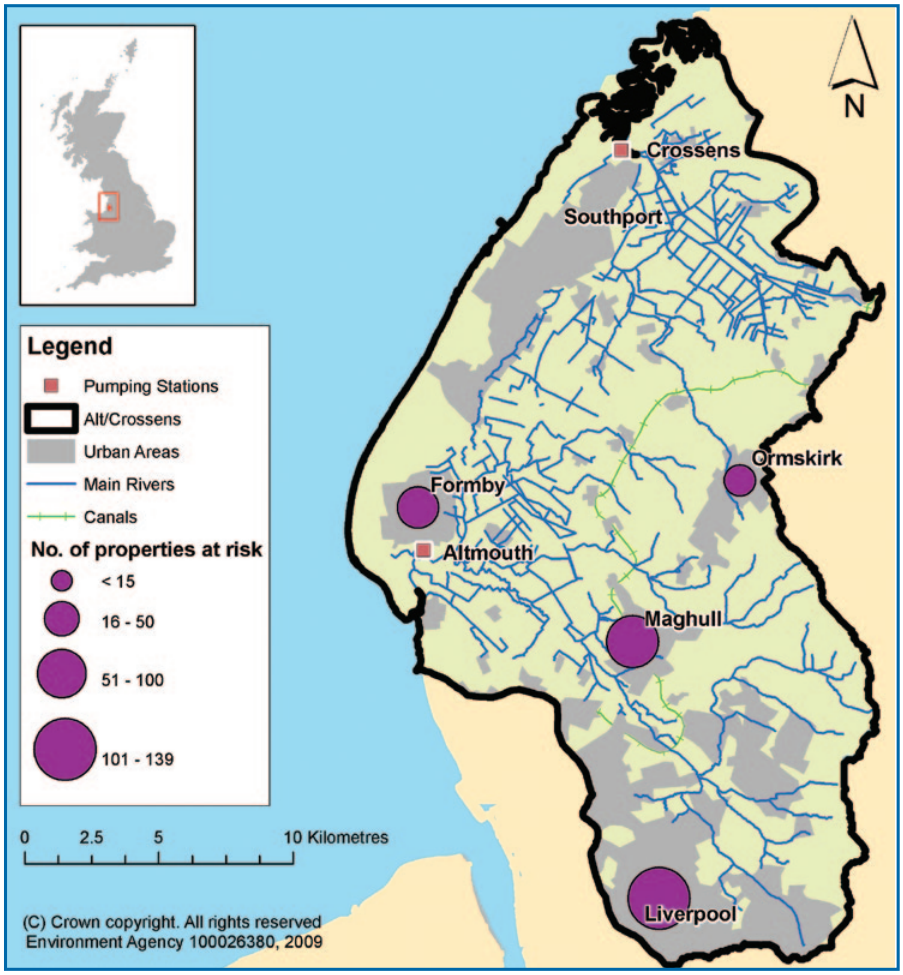
Number of properties at risk	Locations
51 to 150	Sefton Metropolitan Borough Council (Southport, Formby, Maghull) Liverpool City Council (Liverpool)
25 to 50	None
0 to 25	West Lancashire District Council (Ormskirk)

Table 2. Critical infrastructure at risk:

Liverpool Railway Lines, 3 A roads (A570, A59, A565), 4 B roads (including B5243, B5195, B5424) and 12 minor roads, 3 Electricity/gas sub stations, 2 Waste Management sites, 2 Waste Water Treatment Works

↑ Agriculture in the catchment

Map 2 Risk to property within each sub-area for the 1% annual probability fluvial event



How we currently manage the risk in the catchment

Both the Alt and Crossens catchments have benefited, from engineering schemes implemented over the last 50 years or more. These include:

- The construction of the Altmouth pumping station in the early 1970s overcame the problems of discharging into the sea during high tides, and relieved the increased water levels during high rainfall due to urban development. Channel improvements were also made to improve the flow of water to the station.
- Construction of the Crossens pumping station in the early 1960s, led to the abandonment of gravity outfall, in favour of fully pumping the Crossens catchment. Since construction the station has been refurbished and electrified.

In addition to these engineering schemes, other flood risk management activities are carried out in the catchment. These include activities, which help to reduce the probability of flooding, and those that address the consequences of flooding.

Activities that reduce the probability of flooding include:

- Maintaining and improving existing flood defences, structures and water courses. The Alt Crossens catchment has 35km of raised defences and 13 pumping stations. We spend over £2 million every year in this catchment on maintenance.
- Enforcement, where riparian owners and others carry out work detrimental to flood risk, or need advice about riparian responsibilities.

- Identifying and promoting new flood alleviation schemes where appropriate, such as major refurbishment and improvement the Altmouth pumping station and development of a washland with a storage volume in excess of one million cubic metres in the Lower Alt.
- Working with local authorities to influence the location, layout and design of new and redeveloped property and ensuring that only appropriate development is allowed on the floodplain through the application of Planning Policy Statement 25 (PPS25).

Activities that reduce the consequences of flooding include:

- flood risk modelling and mapping, understanding where flooding is likely to occur;
- operation of floodline and warning services to areas of Southport and Crosby;
- providing flood incident management;
- promoting awareness of flooding so that organisations, communities and individuals are aware of the risk and are prepared in case they need to take action in time of flood;
- promoting resilience and resistance measures for those properties already in the floodplain.

The impact of climate change and future flood risk

In the future, flooding will be influenced by climate change, changes in land use (for example urban development) and rural land management. In the Alt Crossens catchment, with current land drainage practices, sensitivity testing revealed that climate change has the greatest impact on flood risk. Land management change, and urbanisation have a smaller effect. Whilst we do not know exactly what will happen in the future the key trends are:

- more frequent and intense storms causing more widespread flooding from drainage systems and some rivers;
- wetter winters increasing the likelihood of large-scale flooding.

The future scenarios used in the Alt Crossens CFMP were:

- a 30% increase in peak flow in all watercourses;
- a total sea level rise of 670 mm by the year 2100;
- increased urbanisation (by 8% in places).

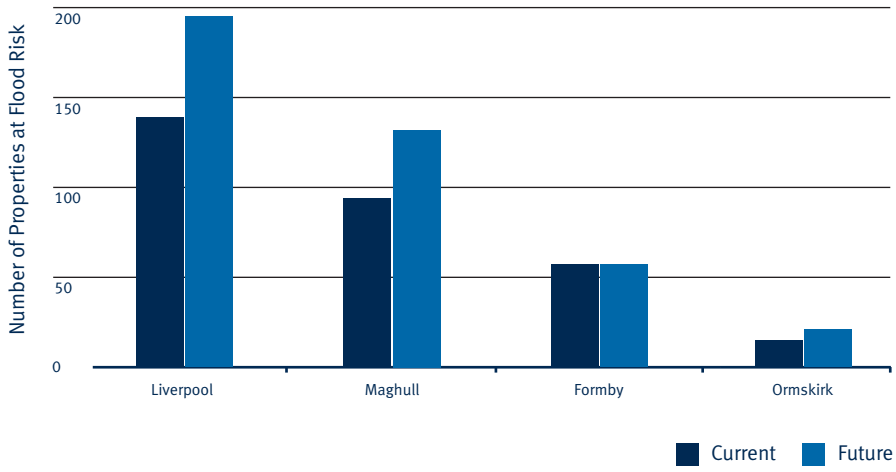
As a result of climate change, we estimate that by 2100 approximately 405 properties will be at risk of fluvial flooding. This is a 30% increase compared to the current number of properties at risk. These properties are primarily located in Liverpool, Maghull and Ormskirk. Flood depths could increase by as much as 0.25m in these areas. Climate change has little effect on river flooding in Southport.

The extent of flooding on environmental sites will increase as a result of climate change and six further sites are potentially at risk in a 1% event.

The effects of climate change were combined with pump failure scenarios and demonstrated potentially large increases in flood risk at Formby and Southport (over 4000 properties).

The graph below shows the difference between current and future flood risks from a 1% event at key locations across the catchment.

Figure 2 Current and future (2100) flood risk to property from a 1% annual probability river flood, taking into account current flood defences.



Future direction for flood risk management

Approaches in each sub-area

We have divided the Alt Crossens CFMP area into eight distinct sub areas that have similar physical characteristics, sources of flooding and levels of risk. These sub areas will allow us and the key stakeholders to promote flood risk management approaches, policies and actions that are most appropriate to deliver the various Government and regional strategies, in particular the Making Space for Water strategy. In the face of increasing risk, it often is not sustainable to keep building and raising defences. This is why we have to look catchment wide at how we direct effort and resources to ensure comprehensive solutions. We have assessed what will be the most sustainable approach to managing flood risk in each sub area. This is presented in the following sections and they outline:

- The key issues in that area.
- The vision and preferred policy.
- The proposed actions to implement the policy.

This document does set out our policies for managing flood risk, recognising the constraints that do exist. Our future direction for managing flood risk is expressed by applying one of our six standard policy options to that sub area. To select the most appropriate policy, the plan has considered how social, economic and environmental objectives are affected by flood risk management activities under each policy option. The six policy options are explained on page 11.

Map 3 Sub-areas

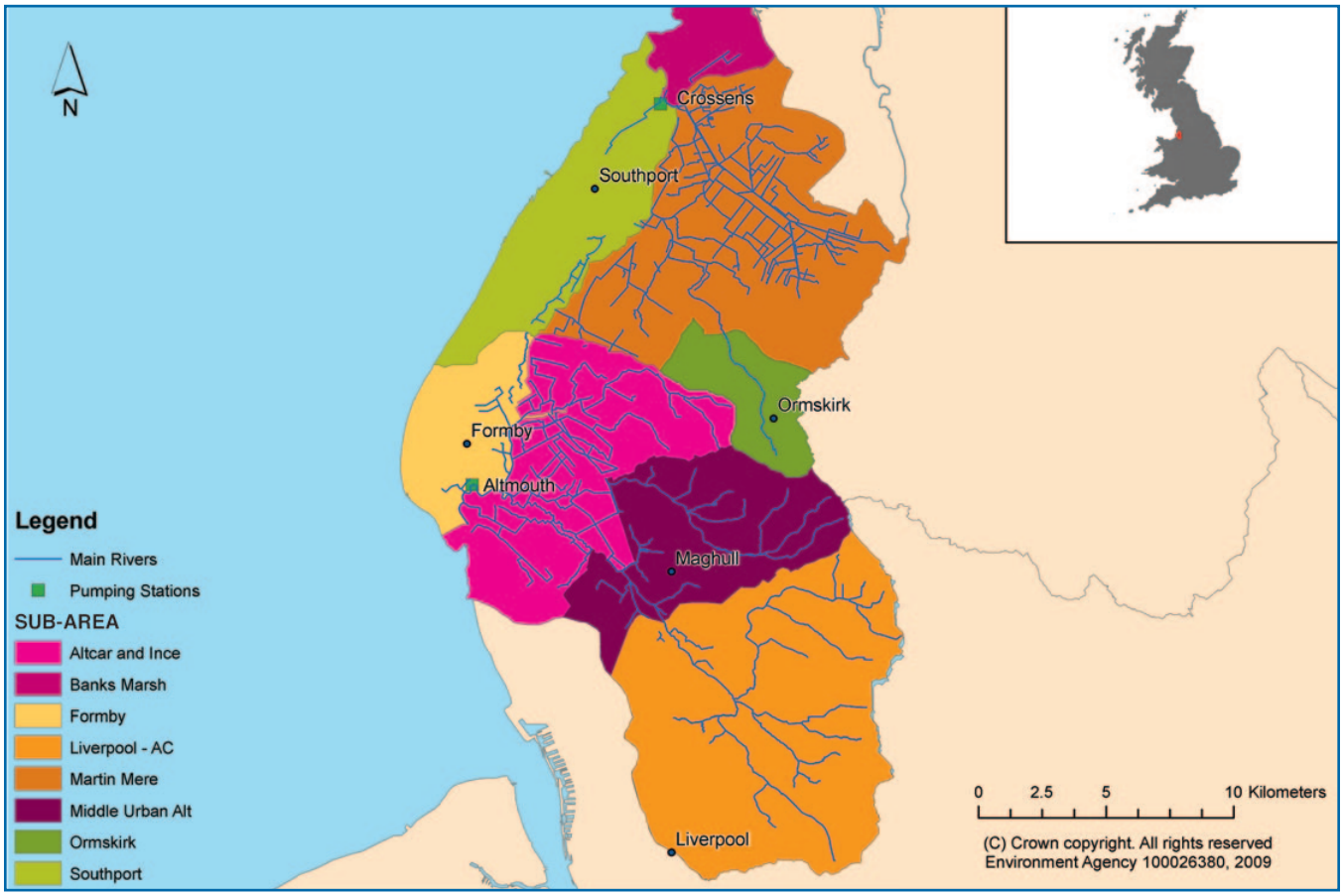


Table 3 Policy options

➜ Policy 1

Areas of little or no flood risk where we will continue to monitor and advise

This policy will tend to be applied in those areas where there are very few properties at risk of flooding. It reflects a commitment to work with the natural flood processes as far as possible.

➜ Policy 2

Areas of low to moderate flood risk where we can generally reduce existing flood risk management actions

This policy will tend to be applied where the overall level of risk to people and property is low to moderate. It may no longer be value for money to focus on continuing current levels of maintenance of existing defences if we can use resources to reduce risk where there are more people at higher risk. We would therefore review the flood risk management actions being taken so that they are proportionate to the level of risk.

➜ Policy 3

Areas of low to moderate flood risk where we are generally managing existing flood risk effectively

This policy will tend to be applied where the risks are currently appropriately managed and where the risk of flooding is not expected to increase significantly in the future. However, we keep our approach under review, looking for improvements and responding to new challenges or information as they emerge. We may review our approach to managing flood defences and other flood risk management actions, to ensure that we are managing efficiently and taking the best approach to managing flood risk in the longer term.

➜ Policy 4

Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change

This policy will tend to be applied where the risks are currently deemed to be appropriately-managed, but where the risk of flooding is expected to significantly rise in the future. In this case we would need to do more in the future to contain what would otherwise be increasing risk. Taking further action to reduce risk will require further appraisal to assess whether there are socially and environmentally sustainable, technically viable and economically justified options.

➜ Policy 5

Areas of moderate to high flood risk where we can generally take further action to reduce flood risk

This policy will tend to be applied to those areas where the case for further action to reduce flood risk is most compelling, for example where there are many people at high risk, or where changes in the environment have already increased risk. Taking further action to reduce risk will require additional appraisal to assess whether there are socially and environmentally sustainable, technically viable and economically justified options.

➜ Policy 6

Areas of low to moderate flood risk where we will take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits

This policy will tend to be applied where there may be opportunities in some locations to reduce flood risk locally or more widely in a catchment by storing water or managing run-off. The policy has been applied to an area (where the potential to apply the policy exists), but would only be implemented in specific locations within the area, after more detailed appraisal and consultation.

Liverpool

Our key partners are:

- Knowsley Metropolitan Borough Council
- Liverpool City Council
- Sefton Metropolitan Borough Council
- St Helens Metropolitan Borough Council
- United Utilities
- Landowners
- Natural England

The issues in this sub-area

Within this sub-area, 139 residential properties are at risk during a 1% annual probability flood event. Some flooding from rivers does occur, as a result of out of bank flow and channel constrictions. In the future, by 2100, we estimate the number of properties at risk to rise to 195 due to the effects of climate change. We are currently managing this risk by carrying out routine maintenance and by the provision of limited raised flood defences which provide a relatively low standard of protection to approximately 20-40 properties during minor flood events. This level of protection will become less effective as the impacts of climate change occur in the future. Surface water flooding is reported to occur in this sub-area. Two railway lines, one electricity sub-station, a gas sub-station and three medical centres are at risk during the 1% event.

The vision and preferred policy

Policy option 4: Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change.

The probability of flooding to the area of Liverpool covered by this sub-area is relatively high. Flooding occurs directly from the River Alt and its tributaries and is associated with out of bank flow as well as flooding associated with conveyance problems on Tue Brook and Deys Brook. Our vision is to sustain the current level of protection into the future and to ensure no increase in flood risk to people and property, which under current conditions is considered appropriate. In future we would anticipate that current defences will be maintained, and maintenance of the river corridors will be continued. If we did not account for climate change in our adopted policy, an additional 60 properties could be affected in a 1% annual probability event (APE). Localised conveyance improvements to Tue Brook and Deys Brook will be sought to address the flood risk associated with these watercourses.

The key messages

- Proactive measures to mitigate for climate change, such as investigating options to improve defences and modify channels/ culverts and look into flood resistance and resilience of property.
- Support local planning authorities to reduce inappropriate development within floodplain.
- Work in partnership with United Utilities and local authorities to produce a surface water management plan identifying the extent and potential management opportunities which could be adopted to reduce the risk of surface water flooding.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Investigate defences and conveyance capacity in Tue Brook and Deys Brook to identify options to mitigate flood risk on these watercourses.
- Establish policies within Local Development Frameworks that work towards long term protection and re-creation of watercourse corridors / floodplain through sustainable land use management.
- Encourage Sustainable Drainage Systems (SuDS) as a means of reducing overall flood risk and controlling pollution from urban run-off.

↑ The Three Graces on Liverpool waterfront - Courtesy of the North West England and North Wales Coastal Group

Middle Urban Alt

Our key partners are:

Sefton Metropolitan Borough Council

West Lancashire District Council

United Utilities

Natural England

The issues in this sub-area

This policy unit is largely rural and contains the town of Maghull and the villages of Aughton and Lunt. It covers the transition between the naturally draining upper Alt through Liverpool and the heavily managed, lowland areas of the Lower Alt catchment. There is flood risk to an estimated 84 residential properties and ten commercial properties in Maghull during a 1% APE. This is mainly due to out of bank flow from the River Alt and blockage and conveyance issues associated with Whinney Brook and Dovers Brook. Approximately 100 hectares of Grade 1 and 2 agricultural land is also at risk of flooding from the river during this event as well as the B5244 road and a waste management site. There are reported incidents of surface water flooding to property in this sub-area.

In the future we estimate the number of properties at risk could increase to 132 by 2100 in a 1% APE due to the effects of climate change. Flood risk is currently managed through routine maintenance of the river corridors, raised defences which provide protection to Lunt and surrounding agricultural land, and by operations at the Altmouth Pumping Station which reduces the risk of the River Alt backing up to Maghull. This level of protection will gradually reduce as river flows increase in the future.

The vision and preferred policy

Policy option 3: Areas of low to moderate flood risk where we are generally managing existing flood risk effectively.

The residential community of Maghull is frequently exposed to river flooding from the River Alt tributaries as a result of conveyance restrictions. This is expected to increase as climate change occurs, resulting in higher flood damages and hazards to people. Our vision is to continue our flood risk management actions but balanced with the fact that: some specific higher risk locations may require improvement, and others less management actions. Flood resistance and resilience opportunities should be encouraged for properties currently at risk. To achieve this, we will continue with the current maintenance programme on the existing flood defences and river corridors. Although we do not anticipate improvements being made to existing defences, future works will be considered to remove channel constrictions to improve conveyance.

The key messages

- The current level of flood risk will be maintained by continuing with the current level of flood risk management. To mitigate against increasing risk, and to cater for climate change related increases in water levels, targetted flood resilience and resistance measures will be encouraged and promoted.
- Work with local planning authorities to avoid inappropriate development within the floodplain.
- Reduce risk at the most flood prone places by influencing planning to ensure that development takes account of the level of flood risk.
- Work in partnership with United Utilities to and local authorities to identify extent and potential management opportunities which could be adopted to reduce the risk of surface water flooding.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Undertake a pre-feasibility study for conveyance improvements to Whinney Brook Culvert and Dovers Brook.
- Undertake investigations to determine the feasibility of flood storage on Sudell Brook to reduce the impact of flooding downstream.
- Establish policies within Local Development Frameworks that work towards long term protection and re-creation of wetland corridors/floodplain through sustainable land use management.
- Encourage SuDS as a means of reducing urban run-off and surface water flood risk, whilst benefiting water quality.
- Encourage the use of flood resistance and resilience measures to mitigate flood risk.

↑ The River Alt and surrounding agriculture downstream of Maghull

Altcar and Ince

Our key partners are:

Sefton Metropolitan Borough Council

West Lancashire District Council

Land Managers

Natural England

The issues in this sub-area

The Altcar and Ince sub-area is predominantly rural with a number of small villages. The main flood risk is from the River Alt, either as a result of overtopping of defences or surface water ponding as a result of the land drainage system backing up from high water in the river. However, only one property is at risk during a 1% APE. The main economic risk of flooding is to approximately 200 hectares of high grade agricultural land. Flood risk management is heavily reliant upon the Altmouth Pumping Station to provide land drainage and, without this, there would be an extensive risk to agricultural land. Within this sub-area, two minor roads and the Hill House Waste Water Treatment Works are at risk of flooding. The Downholland Moss SSSI and part of the Sefton Coast SSSI are located within this sub-area. No further properties are at risk due to the effects of climate change.

The vision and preferred policy

Policy option 6: Areas of low to moderate flood risk where we will take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits.

The agricultural land at risk of flooding has economic importance locally and regionally and continued protection is considered appropriate. Altmouth Pumping Station provides this level of protection and also provides benefits to upstream and downstream locations such as Maghull and Formby. Our vision is to continue operating the pumping station, and over the whole Alt catchment carry on routine maintenance of the River Alt and the arterial drainage ditches. The effects of climate change will lead to increased risk to agricultural areas without increased operational time or capacity at the pumping station. We also envisage a reduction in management of smaller watercourse and tributaries within this policy unit. We believe this will result in localised re-naturalisation and 'wetting up' of land, delivering localised flood storage and environmental benefits. In particular, flood storage options are being considered at Lunt Meadows.

The key messages

- High grade agricultural land has major economic importance locally and regionally, and contributes significantly to UK food production. This makes it necessary to pursue this policy ensuring minimal effects on agricultural food production.
- Agricultural practice and land management must consider soft approaches to the environment, habitat creation and soil management to contribute to wider sustainability of agriculture. For example, agri-environment schemes and improved soil management.
- There are opportunities for habitat enhancement through 'wetting up' of land and promotion of ecological networks.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Refurbishment of Altmouth Pumping Station is critical to the continued management of flood risk over the whole catchment and this sub-area, it plays a significant role in existing agricultural practice.
- Develop the Lower Alt with Crossens Pumped Drainage Strategy involving key catchment stakeholders.
- Review the Environment Agency obligations for land drainage and satellite pumping station operation throughout this sub-area.
- Identify opportunities for wetting up, and linking areas of ecological value.
- Investigate and promote a partnership approach for the Lunt Meadows Washland development.

↑ Hightown and the mouth of the River Alt- Courtesy of the North West England and North Wales Coastal Group

Formby

Our key partners are:

Sefton Metropolitan Borough Council

West Lancashire District Council

United Utilities

Developers

The issues in this sub-area

This sub-area contains the coastal town of Formby and the surrounding agricultural area. The River Alt runs through in the south of the sub-area and is discharged via Altmouth Pumping Station which maintains water levels in the Alt low enough to allow free discharge of the drainage network in Formby. Flooding occurs to approximately 60 properties in Formby during the 1% APE due to backing up of the drainage infrastructure, conveyance issues and blockages. The B5195 and B5424, two minor roads, two gas and electricity sub-stations, one waste management site and Formby Waste Water Treatment Works are at risk during the 1% APE. There are limited reports of surface water flooding. The risk of flooding is currently managed by undertaking channel maintenance in conjunction with continued operation of Altmouth Pumping Station. By 2100 the effects of climate change do not put any further properties at risk.

The environmentally designated sites of Ribble and Alt Estuaries and the Sefton Coast are located partially in this sub-area.

The vision and preferred policy

Policy option 4: Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change.

The current flood risk management measures deliver an appropriate level of risk to the people and property in Formby. The impact of climate change will primarily be an earlier onset of flooding. Our vision for this sub-area is to continue to maintain the current standard of flood risk protection into the future. Local businesses and property owners will be encouraged to adopt flood protection measures to help plan for and manage risk to property.

The key messages

- It is our intention to refurbish and continue to operate Altmouth Pumping Station to provide the current standard of service.
- Continue to work with local authorities in order to prevent inappropriate new development in areas at flood risk.
- Encourage properties currently at risk to consider flood resistance and resilience measures.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Identify potential local hotspots for surface water flooding and develop a Surface Water Management Plan in conjunction with United Utilities and local authorities.
- Promote individual business flood resilience management plans.
- Identify potential sites and investigate the potential role of minor booster pumping stations to assist conveyance within urban watercourses.
- Establish policies within Local Development Frameworks that work towards long term protection and re-creation of watercourse corridors/floodplain through sustainable land use management.

Formby Point- Courtesy of the North West England and North Wales Coastal Group

Ormskirk

Our key partners are:

West Lancashire District Council

Developers

Natural England

The issues in this sub-area

This sub-area contains the rural market town of Ormskirk which is set amidst high grade agricultural land. Ormskirk is located at the upper reach of the main gravity draining watercourse in the Crossens catchment. Flooding through Ormskirk is associated with capacity issues and blockage of the culverts within Ormskirk, in particular the A59 culvert, which can result in 15 properties being affected by flood water in a 1% event. The A59 and A570, along with three minor roads are at risk during the 1% APE. Out of bank flow occurs in rural areas downstream of Ormskirk potentially causing flood risk to 30 hectares of grade 1 and 2 agricultural land. Flood risk management is focussed on river asset and channel maintenance activities.

The vision and preferred policy

Policy option 4: Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change.

The current level of flood risk is considered appropriate for the sub-area of Ormskirk and the current level of flood risk will be maintained into the future through continued maintenance of the river corridor. This will mitigate the impacts of climate change which, if left unmanaged, would result in an additional six properties at risk. Our vision is to focus on reducing the risk of flooding that occurs as a result of conveyance and blockage issues and to promote the adoption of flood resilience techniques. We also believe that there could be opportunities to provide flood storage higher in the catchment on Hurlston Brook and Sandy Brook which may reduce downstream flood risk.

The key messages

- Agriculture contributes significantly to the local economy and productivity of the land needs to be considered. Current flood-related impacts to agriculture are considered to be at an appropriate level.
- Flood risk to property within the sub-area is primarily related to the conveyance, capacity and blockage of culverts and therefore concentrated works will alleviate the risk to property.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Pre-feasibility studies into the flood storage potential for Hurlston Brook and Sandy Brook and identification of downstream and environmental benefits.
- Investigate the capacity of problem culverts, including the A59 culvert, and assess the potential benefits of installing CCTV monitoring of the upstream debris screens.
- Establish policies within Local Development Frameworks that work towards long term protection and re-creation of watercourse corridors/floodplain through sustainable land use management and integration with green space agenda.

↑ Culvert under A59, Ormskirk

Martin Mere

Our key partners are:

- Sefton Metropolitan Borough Council
- West Lancashire District Council
- Environmental groups
- National Farmers Union
- Local agricultural groups
- Natural England

The issues in this sub-area

This sub-area is situated in the heart of the Crossens catchment, and is a low lying area which is reliant on pumping for land drainage. The area is predominantly used for high grade agriculture, and is environmentally rich, with several designated sites including Martin Mere SSSI/Ramsar and Mere Sands Wood SSSI. Under the current, heavily managed regime, only two properties are at risk during a 1% APE, but there are 1500 hectares of high grade agricultural land at risk. Three kilometers of raised defences provide a 2% standard of protection to Martin Mere SSSI. The Southport to Wigan and the Preston to Liverpool railway lines, the B5243 and 7 minor roads are at risk during the 1% event. By 2100 no further properties are at risk in a 1% APE due to climate change.

Surface water ponding and insufficient capacities of the satellite pumping stations during periods of heavy rainfall contribute to the main source of flood risk.

The vision and preferred policy

Policy option 6: Areas of low to moderate flood risk where we will take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits.

Extensive areas of high grade agricultural land and one property are at risk during the 1% APE. Without the current level of flood risk management, as many as 1,500 properties could be affected by flood waters. Our vision for this sub-area is to continue the current level of flood risk management activity, thus enabling the drainage system to function. This will also maintain water levels at the sites of environmental importance and therefore reduce potential impacts associated with water level change. We do not plan to increase our management activities to adapt to the impacts of climate change, as a result there will be greater wetting up of land during periods of high rainfall.

The key messages

- Martin Mere sub-area contains significant areas of high grade agricultural land which has local economic importance and wider regional and national food production importance.
- Various national and international sites of environmental value are located within this sub-area and we are obliged to protect these sites under legislation.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Review the status of some of the main river watercourses.
- Review the use of satellite pumping station operation throughout this sub-area and use the findings to help identify opportunities for wetting up and linking areas of ecological value to create ecological networks.
- Develop the Lower Alt with Crossens Pumped Drainage Strategy involving key catchment stakeholders.
- Review the potential for rationalisation of pumping station capacity.

↑ The Sluice and Middle Drain Watercourses

Southport

Our key partners are:

Sefton Metropolitan Borough Council

West Lancashire District Council

United Utilities

Environmental groups

The issues in this sub-area

This sub-area is predominantly urban and contains the seaside town of Southport. Under the current pumped and heavily maintained flood management regime, there are no properties at risk during a 1% APE. There is a 200m length of raised embankment providing the Meols Cop Retail Park with a 2% standard of protection. Decreased maintenance activities or a reduction in the pumping regime could potentially lead to increased flood risk to as many as 4,000 properties. Parts of Southport town are at risk from surface water flooding and also from coastal flooding, the latter is currently being assessed as part of the production of the shoreline management plans (SMP). There are a number of environmentally designated sites in this sub-area including the Sefton Coast, Hesketh Golf Links and the Ribble and Alt Estuaries.

The vision and preferred policy

Policy option 4: Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change.

This sub-area is largely urban and current flood management practices result in no flood risk to property and only seven hectares of agricultural land at risk during a 1% APE. Our vision is to sustain the current level of flood risk management into the future, this will include keeping an appropriate level of maintenance and the continued operation of the Crossens Pumping Station located in the Martin Mere sub-area. To ensure no increase in flood risk to Southport from the effects of climate change, increased operation of Crossens Pumping Station, in conjunction with a potential flood warning area at Meols Cop, will contribute to the management of these increased risks.

The key messages

- Surface water flooding does present a flood risk to people and property although information on the scale or location of this risk is incomplete.
- Properties in the low lying areas of Southport rely solely on the operation of Crossens and satellite pumping stations to manage flood risk. Reduction of capacity, failure or removal of these pumping stations could lead to a significant increase in the number of properties at risk.

Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Investigate extension of the existing Flood Warning Area in the locality of Meols Park.
- Promote individual business flood resilience management plans.
- Identify potential local hotspots for surface water and sewer flooding and develop a Surface Water Management Plan in conjunction with United Utilities and local authorities. Part of this plan should consider opportunities for the implementation and encouragement of SuDS as a means of reducing overall flood risk and controlling pollution and urban run-off.

↑ Marsh Side SSSI

Banks Marsh

Our key partners are:

- Sefton Metropolitan Borough Council
- West Lancashire District Council
- National Farmers Union
- Natural England
- Environmental groups

The issues in this sub-area

The majority of this sub-area is high grade agricultural land with a few isolated properties and farms. Under the current, heavily maintained, flood management regime there is no risk to property and only a limited risk to agriculture; this is largely due to Banks Marsh and Crossens Pumping Stations. There are no raised defences providing protection from river flooding, but there are raised coastal defences running the entire length of this sub-area's boundary with the Ribble Estuary. Within this sub-area are a number of environmentally designated sites including the Ribble Estuary SSSI and Ramsar site and the River Alt Estuary SPA and Ramsar site. No further properties are at risk in this sub-area due to climate change.

The vision and preferred policy

Policy option 4: Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change.

Within this sub-area, flood risk to people, property and agricultural land is limited. It is recognised however that as the impacts of climate change occur, increased wetting up and ponding of agricultural land will occur. Our vision is to continue the current level of flood risk management to maintain the current standard of protection accepting that the risk of flooding may increase into the future. As part of this management, Banks Marsh Pumping Station will be appraised for refurbishment.

The key messages

- High grade agricultural land is the predominant feature in this sub-area and plays an important role in the economy of local communities. We will continue our land drainage activities to enable agricultural practice to continue where it is justifyable to do so.
- Due to the effects of climate change flood risk will increase over time. However, we envisage that with the current flood risk management measures, the impacts of these increased risks to agricultural production will be limited.

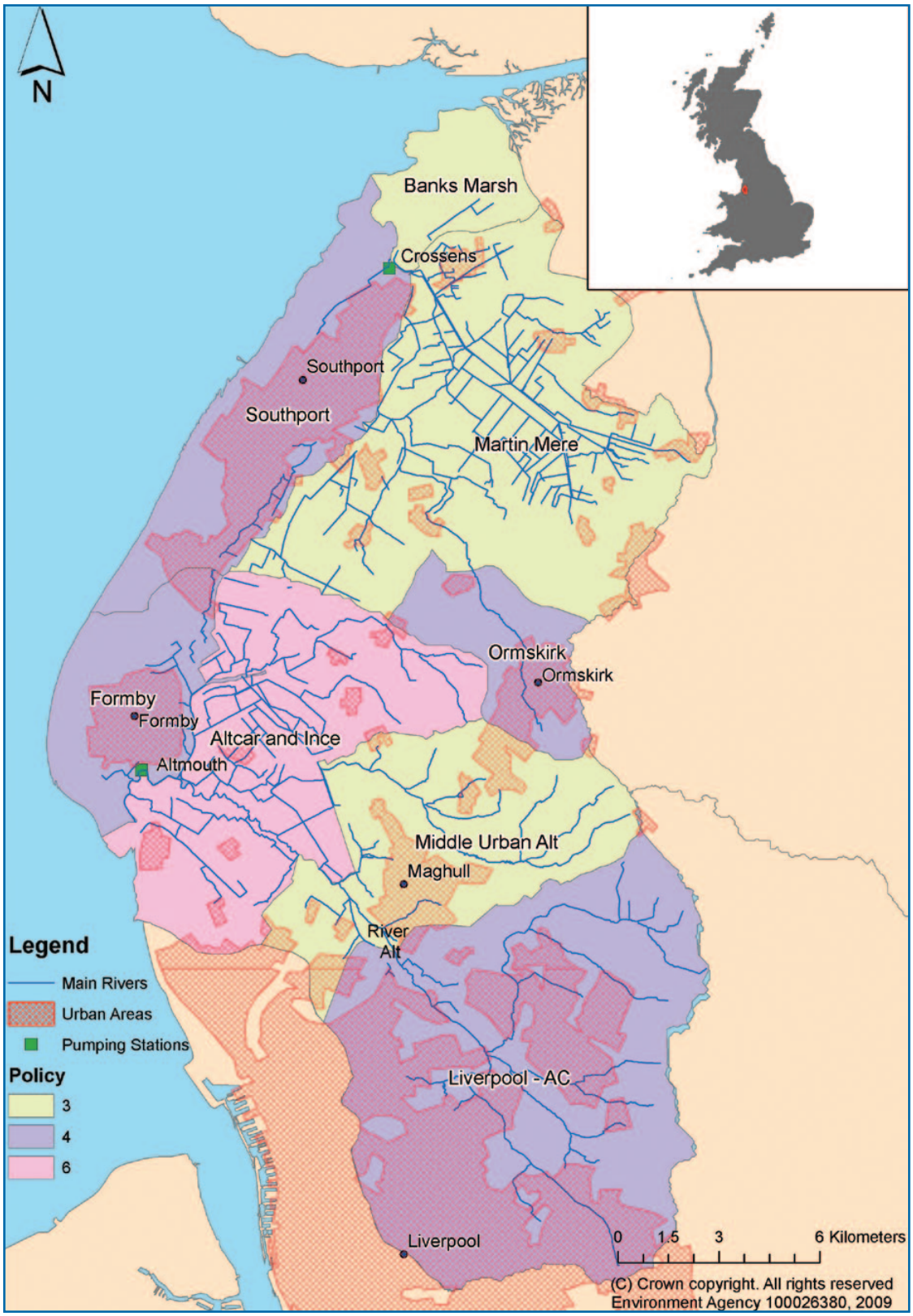
Proposed actions to implement the preferred policy

The essential actions to achieve our policy aim are listed below:

- Review the status of some of the main river watercourses.
- Review the operation of the Environment Agency's satellite pumping stations throughout this sub-area and use the findings to help identify opportunities for wetting up and linking areas of ecological value to create ecological networks.
- Promote agri-environment schemes and encourage take up to support improved soil management, minimise flood risk and encourage the improvement and creation of ecological networks.

↑ Banks Marsh and the mouth of the River Crossens- Courtesy of the North West England and North Wales Coastal Group

Map of CFMP policies



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