

North Norfolk Catchment Flood Management Plan

Summary Report December 2009



managing
flood risk

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Introduction



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

The North Norfolk 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, ground water, surface water and tidal flooding, but not flooding directly from the sea (coastal flooding). This is covered by Shoreline Management Plans (SMPs). Our coverage of surface and groundwater flooding 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.

There are different sources of flood risk in the catchment. The North Norfolk CFMP area is prone to sudden summer storms with heavy rainfall and this can cause flooding on the River Mun, Weybourne Beck, River Glaven, River Stiffkey, River Burn and River Hun. River flooding can

occur quite often as there are no formal flood defences in the catchment. Flooding is made worse in many places by bridges, culverts, fords and walls that restrict the flow of water downstream. High tide levels can prevent river flows from draining away and this is called 'tide-locking'. Tide-locking can increase flood water levels locally on the lower reaches of the rivers Glaven, Burn, Stiffkey and Hun and the Cley watercourses. Groundwater, sewers and surface water flooding has also occurred in the past. For example, surface water flooding has occurred in Sheringham.

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 manage flood risk in the future. We work with many organisations, groups and individuals with an interest in how flood risk is managed including local authorities, Internal Drainage Boards (IDBs), water companies, conservation bodies such as Natural England and the public.

This is a summary of the main CFMP document. If you would like to see the full document an electronic version can be obtained by emailing enquiries@environment-agency.gov.uk or telephoning 08708 506 506. Alternatively, paper copies can be viewed at any of our offices in Anglian Region.

A handwritten signature in black ink that reads "Paul Woodcock". The signature is written in a cursive style with a horizontal line underneath the name.

Paul Woodcock
Regional Director Anglian Region

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↑ Cley Catchwater Drain

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:

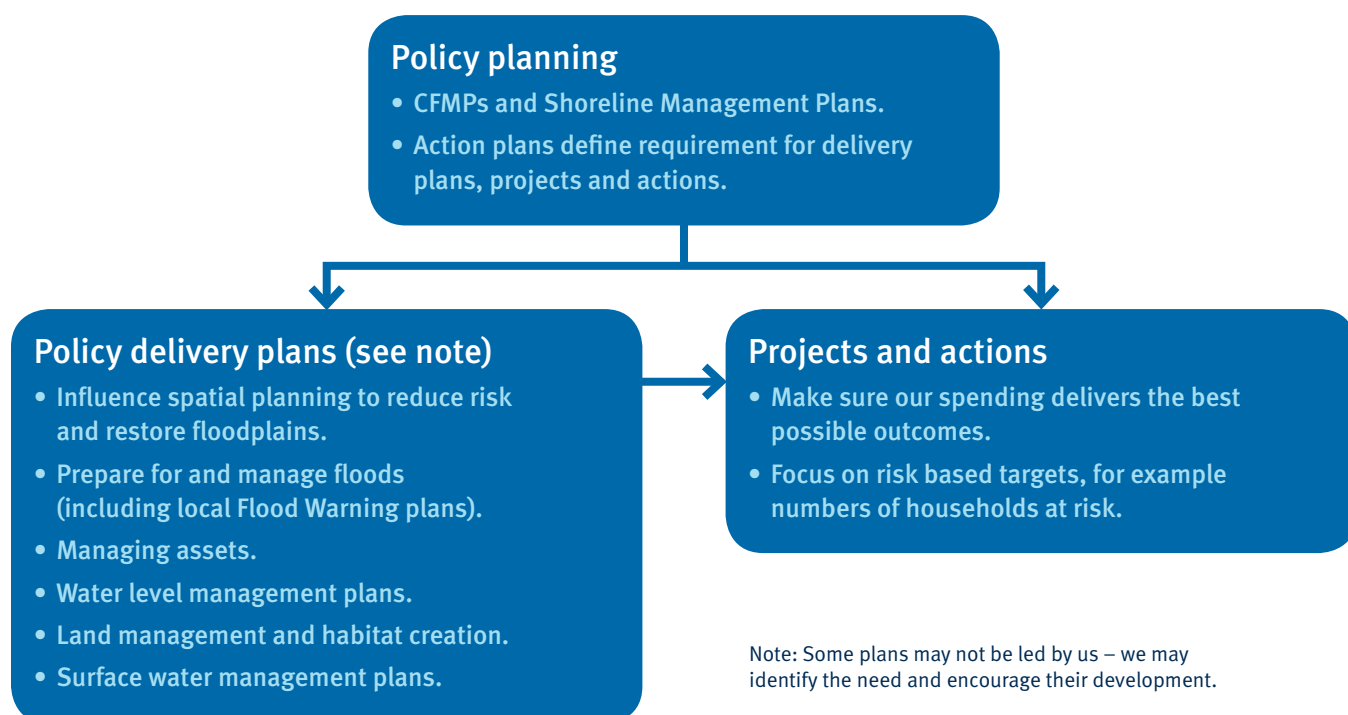
- the Environment Agency, who will use the plan to guide decisions on investment in further plans, projects or actions;
- regional planning bodies and local authorities who can use the plan to inform spatial planning activities and emergency planning;

- Internal Drainage Boards (IDBs), water companies and other utilities to help plan their activities in the wider context of the catchment;
- transportation planners;
- land owners, farmers and land managers that 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



Catchment overview

The North Norfolk CFMP area is located in the east of England and covers an area of around 500 km², with a population of 50,000 people. Map 1 shows the location and extent of the North Norfolk CFMP area. The downstream limit of the CFMP area is located at the Hunstanton to Kelling Hard and Kelling Hard to Lowestoft Ness Shoreline Management Plans (SMPs). The SMP deals with coastal flood management issues and tidal flooding along this coastline. The CFMP considers tide-locking on the lower reaches of the River Glaven, Burn, Stiffkey and Hun when the outfalls are closed.

Most of the CFMP area is used for arable crop production, with the majority being grade three agricultural land. The quality of the land generally improves to grades one and two towards the east of the CFMP area. Small areas of land in the centre and the west are classified as grade four. There is no grade five land in North Norfolk CFMP area. Cromer, Sheringham and Holt are the largest settlements in the CFMP area. There are a large number of tourists in the summer months that come particularly to

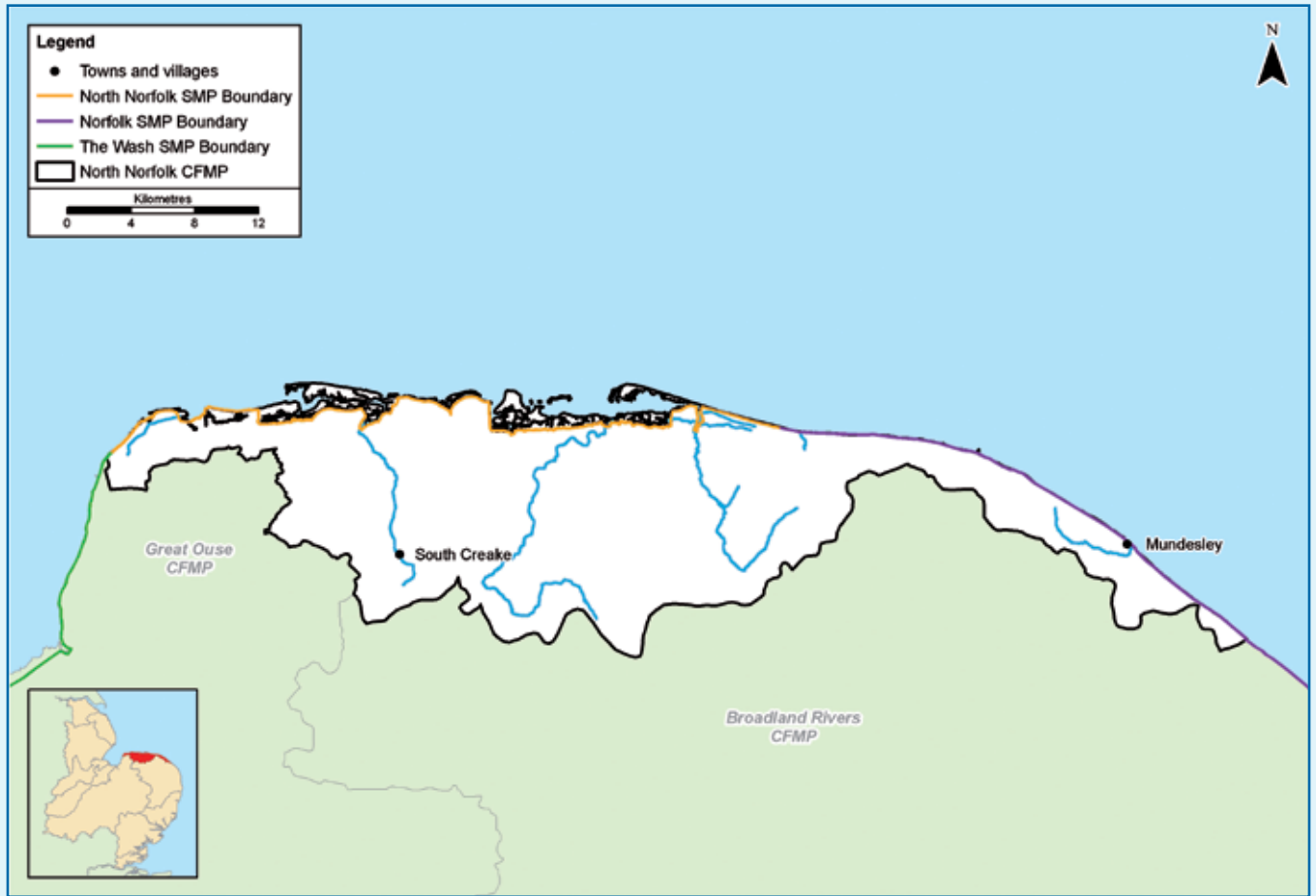
enjoy the coastline and they help to support the local economy. The CFMP area covers the River Mun, Weybourne Beck, River Glaven, Cley Catchwater Drain, Cley New Cut, River Stiffkey, River Burn and River Hun. Norfolk Rivers IDB has an important role in managing land drainage in the North Norfolk CFMP area.

Glacial till and sand and gravel dominate the drift geology of CFMP area. The chalk geology dips from west to east and there are marine derived sands and fossil shells and clays to the east along the narrow strip of the CFMP area. This covers Sheringham, Cromer and Mundesley. Glacial sands and gravels, and boulder clay overlie the solid geology in many places. The River Burn is influenced most by the underlying chalk and suffers from intermittent flows during dry periods. In the areas where there is chalk bedrock, runoff may infiltrate the rock delaying the response of rivers to rainfall and reducing peak flood flows. There is also a risk from groundwater flooding in these areas.

The larger rivers rise in the south of the CFMP area, and are generally small and steep in their upper reaches. In their lower reaches the geography is flatter and the rivers become wider. The Cley Catchwater Drain, Cley New Cut and River Hun are small rivers that cross areas of environmental significance. The River Glaven, Cley Catchwater Drain, Cley New Cut, River Stiffkey, River Burn, River Hun and Weybourne Beck all outfall through coastal defences.

The landscape value of North Norfolk is recognised in its designation as part of the Norfolk Coast Area of Outstanding Natural Beauty (AONB) which covers the lower river valleys and the coast. There are a number of sites designated for their environmental importance including Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site and Biosphere Reserve (BR). Sites of Special Scientific Interest (SSSI) in North Norfolk include wetland fen, marsh, grassland and coastal habitats. Scheduled Monuments (SMs) designated for their heritage value, are distributed across the CFMP area.

Map 1 Location and extent of the North Norfolk CFMP area



↑ River Glaven

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% annual probability flood has a 1% chance or 0.01 probability of occurring in any one year, and a 0.5% annual probability flood has a 0.5% chance or 0.005 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.

The catchment has a history of flooding. River flooding has happened on many of the rivers in the catchment and has affected most properties on the Rivers Burn and Stiffkey. For example in July 2004, properties were flooded in South Creake and North Creake. Groundwater and surface water flooding have also occurred in the catchment, the most significant being in Sheringham in August 2006.

Currently the main sources of flood risk for people, property, infrastructure and the land are:

- river flooding of all watercourses, particularly in the villages of South Creake and Mundesley;
- the impacts of rivers not being able to flow freely to the sea during high tide (called tidal locking), particularly on the lower reaches of the River Glaven, Stiffkey and Burn;
- surface water drainage and sewer flooding. Surface flooding has caused significant disruption in Cromer and Sheringham in the past. The risk of sewer flooding is scattered but can be a particular problem in the upper Burn valley.

What is at risk?

At present there are around 300 people and 200 commercial and residential properties at risk from the 1% annual probability river flood. This means that only 0.6% of the total population in the CFMP area is currently at risk from flooding.

There is approximately 92 km² of grade one and two agricultural land in the CFMP area and less than 1% is at risk of flooding in the current 1% annual probability river flood. Currently there are no significant lengths of transport routes at risk and the only infrastructure at risk is an electricity sub-station.

It is difficult to assess the current impact of flooding on environmental features but an SPA, a Ramsar site, two SACs, six SSSIs and three National Nature Reserves (NNR) are at flood risk. There are also 10 Scheduled Monuments (SMs) at flood risk the 1% annual probability river flood.

Where is the risk?

Approximately 40% of the people and properties that are currently at risk from a 1% annual probability river flood within the CFMP area are located in South Creake, with a further 20% located in Mundesley.

The distribution of properties at risk from a 1% annual probability river flood is illustrated in Map 2. Table 1 summarises where there is flood risk to more than 25 properties. Table 2 summarises the critical infrastructure that is at risk from a 1% annual probability river flood. We recognise that there is also a potential risk from surface water and groundwater flooding. However, further studies following on from the CFMP are required by us and our partners to quantify this potential risk.

Table 1 Locations of towns and villages with 25 or more properties at risk in a 1% annual probability river flood

Number of properties at risk	Locations
50 to 100	South Creake
25 to 50	Mundesley, North Creake and Burnham Thorpe

Table 2 Critical infrastructure at risk in a 1% annual probability river flood

One electricity sub-station



↑ Spring Beck

Map 2 Flood risks to property in a 1% annual probability river flood, taking into account current flood defences



How we currently manage the risk in the catchment

The CFMP area has a history of flooding, generally due to sudden storms leading to flash flooding on watercourses and surface water flooding in urban areas. There are no formal flood defences in this CFMP area however there are informal flood banks along some river reaches and many of the rivers have been modified and straightened in the past.

In addition to these engineering schemes, other flood risk management activities are carried out in the CFMP area. These include

activities which help to reduce the probability of flooding and those that address the consequences of flooding.

Activities that reduce the consequences of flooding include:

- maintaining river channels;
- maintenance of drainage networks by the Norfolk Rivers Internal Drainage Board (IDB) and landowners;
- maintenance of road drainage and sewer systems.

Activities that reduce the consequences of flooding include:

- 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);
- understanding where flooding is likely by using flood risk mapping;

- providing flood forecasting and warning services;
- 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.

Combinations of engineering and other flood risk management activities are used to reduce the probability or consequences of flooding. We have investigated which activities are likely to be most effective and appropriate in different parts of the CFMP area in the future.

The impact of climate change and future flood risk

In the future, flooding can be influenced by climate change, changes in land use (for example urban development) and rural land management. Using river models we tested the sensitivity of the rivers in the CFMP area to these drivers.

For urbanisation, we tested increases to the urban area of 10% up to 2100. Increasing urbanisation did not have a significant impact on flood risk. Therefore, urbanisation was not taken forward into the final future scenario.

For rural land management, we adjusted the river models to represent the effect of reducing intensive farming practices. At a catchment scale this had a limited impact on flood risk. Therefore, changes in rural land management were not taken forward into the final future scenario.

For climate change we tested the following changes up to 2100:

- 20% increase in peak flow in all watercourses. This will increase the probability of large-scale flood events;
- A total sea level rise of 980 mm by the year 2100. This will increase the probability of tidal flooding (this is looked at in the relevant SMP) and increase the length of time of tide-locking on the rivers Glaven, Stiffkey, Burn, Hun, Weybourne Beck and the Cley watercourses.

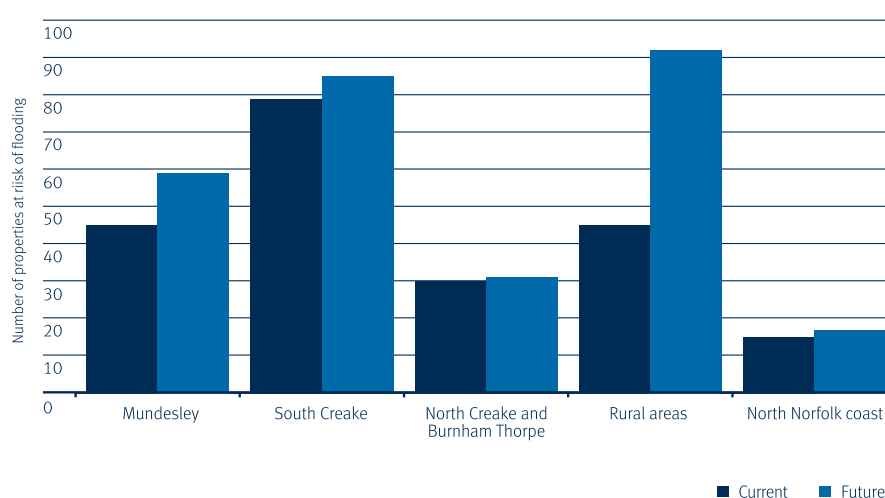
Climate change was shown to have a significant impact on flood risk.

In the North Norfolk CFMP area, climate change was shown to have the greatest impact on flood risk. Therefore, the scenario used to model future flood risk was based only on climate change as described.

Using river models we estimate that by 2100, around 400 people and 300 properties will be at flood risk from the 1% annual probability river flood. There is no significant increase in the number of people or properties at risk in the North Norfolk CFMP area in the future, although the risk to life will increase in Mundesley, where there is a danger from deep and fast flowing water during a flood. Figure 2 shows the difference between current and future flood risks at key locations, focusing on river flooding and tide locking.

It is unlikely that the impact of flooding on environmental sites will change significantly in the future. Ten additional listed buildings may be at flood risk in the future.

Figure 2 Current and future (2100) flood risk to property from a 1% annual probability river flood



Future direction for flood risk management

Approaches in each sub-area

We have divided the North Norfolk catchment into 5 distinct sub-areas which have similar physical characteristics, sources of flooding and level of risk. We have identified

the most appropriate approach to managing flood risk for each of the sub-areas and allocated one of six generic flood risk management policies, shown in Table 3.

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.

Map 3 Sub-areas and flood risk management policies

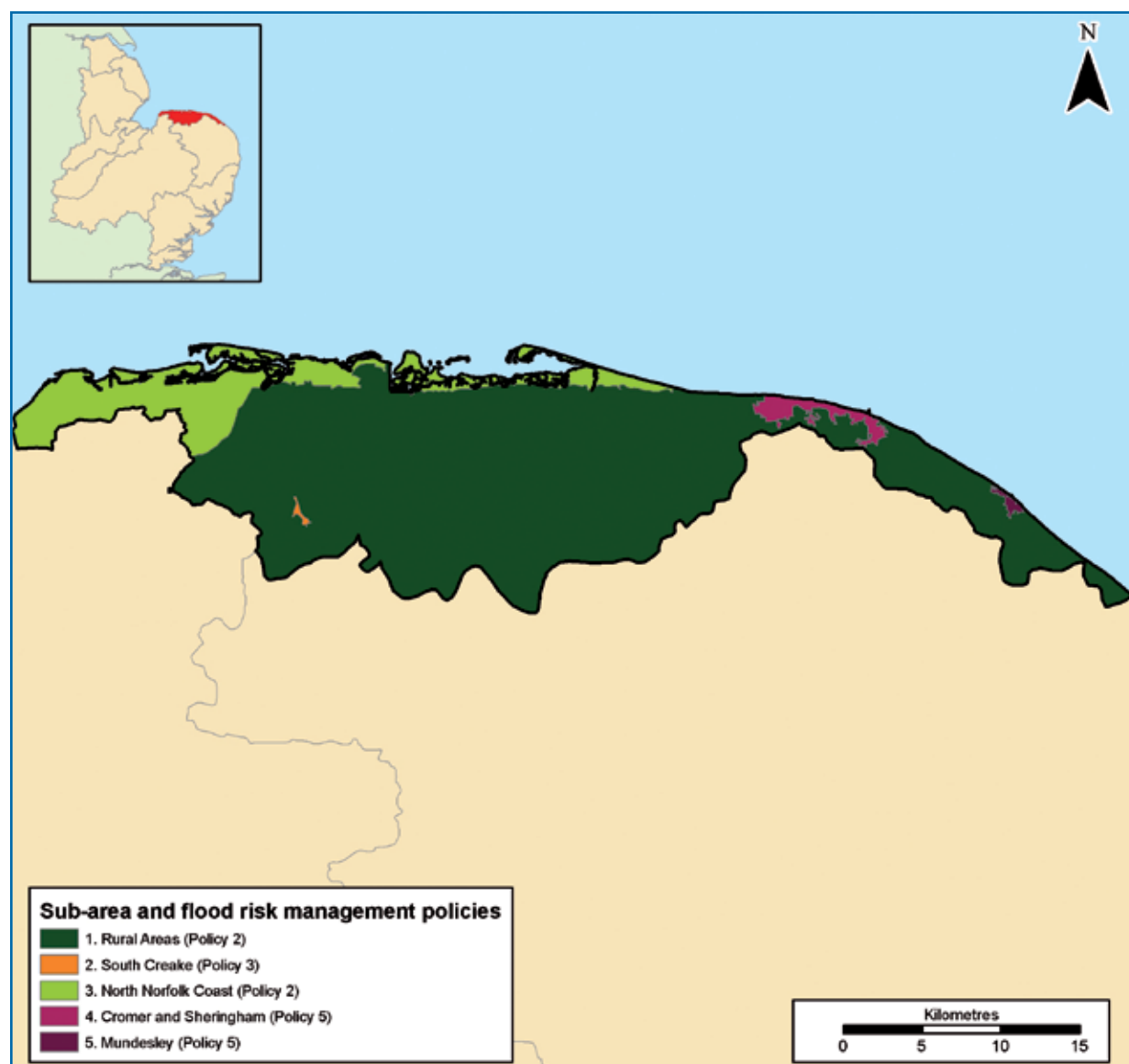


Table 3 Flood risk management policy options

→ 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.

Rural areas

Our key partners are:

Norfolk County Council

North Norfolk District Council

Natural England

The issues in this sub-area

This sub-area contains mainly agricultural land but includes many small villages, hamlets and isolated properties. Currently, 75 properties located in this sub-area are at risk from the 1% annual probability river flood.

Those at risk are located in isolated areas scattered throughout the sub-area. There is approximately 3% of grade two agricultural land at risk from flooding within this sub-area. The A149 Coast Road, A148 Cromer to King's Lynn, B1149, B110, B1355 and B1155 are at risk in the 1% annual probability river flood. One electricity sub-station is at risk in the 1% annual probability river flood. Some environmental sites in this sub-area may benefit from flooding. Table 4 details flood risk to people and property in this sub-area.

Table 4 Risk to people and property within the Rural areas sub-area during a 1% annual probability river flood

	Current	Future (2100)
Number of people	116	197
Number of properties	75	123

The vision and preferred policy

Policy option 2: Areas of low to moderate flood risk where we can generally reduce existing flood risk management actions.

In the rural reaches the current activity to manage flooding is out of proportion with the level of flood risk, or is not effective. In general, overall flood risk management activities will be reduced within the sub-area, however where flood risk is more concentrated (for example in towns and villages) existing actions to manage flooding may be continued.

The preferred approach is to reduce bank and channel maintenance in some locations. This will enable limited resources to be targeted to other areas of the catchment where the risks are greater, to ensure value for money. The preferred policy will also help improve the flow between the river and its floodplain and so improve wetland and aquatic habitats.

Flood warning is an important way of managing the consequences of flooding throughout the catchment. Therefore, the local flood warning infrastructure (such as river flow gauging stations) needs to be maintained.

The key messages

- Where feasible, flood risk management activities will be reduced as the current activity to manage flooding is out of proportion with the level of flood risk.
- Reducing bank and channel maintenance will help naturalise rivers and improve the flow between the river and its floodplain.
- Maintain flood warning infrastructure (such as river flow gauging stations) to ensure that an effective flood warning service can be provided throughout the catchment.

Proposed actions to implement the preferred policy

- Investigate options to cease or reduce current bank and channel maintenance and flood defence maintenance. In addition, changes in land use, development of sustainable farming practices and environmental enhancement should be investigated to mitigate an increase in flooding in the future.
- Continue with the flood warning service including the maintenance of flood warning infrastructure (i.e. river flow gauging stations) and public awareness plans.
- Encourage planners to develop policies to prevent inappropriate development in the floodplain. The floodplain should be maintained as an asset to make space for water.
- Work with partners to develop an emergency response plan for critical infrastructure and transport links at risk of flooding.



↑ River Stiffkey

South Creake

Our key partners are:

The Borough Council of King's Lynn and West Norfolk

North Norfolk District Council

Norfolk Rivers IDB

The issues in this sub-area

This sub-area includes the urban area of South Creake at the upstream end of the River Burn. Currently, 79 properties located in this sub-area are at risk from the 1% annual probability river flood. The cause of flooding is predominantly river flooding which can be made worse by the backing up of water behind structures such as bridges. There is approximately 14% of grade two agricultural land at risk from flooding within this sub-area. One B-road (B11145) is at risk in the 1% annual probability river flood. There is also risk from surface water and sewer flooding in this sub-area. Table 5 details flood risk to people and property in this sub-area.

We currently undertake a maintenance programme that helps flow to be conveyed in South Creake. We do not maintain any flood defences in South Creake, but we do target our maintenance here to keep the culverts clear and reduce the risk of blockage. We provide a flood warning service for the River Burn.

Table 5 Risk to people and property within the South Creake sub-area during a 1% annual probability river flood

	Current	Future (2100)
Number of people	122	136
Number of properties	79	85

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 settlements in this sub-area have been built in the floodplain and as a result have a history of flooding. In the past flood defences have been constructed and maintenance work carried out to reduce flood risk. Although flood risk is not expected to increase significantly in the future, as there is a concentration of people and property within the floodplain, it is still feasible and effective to continue with the current level of flood risk management. This will be achieved by continuing with existing flood risk management activities.

The key messages

- The current level of flood risk management should be continued.
- Continue current flood risk management activities.

Proposed actions to implement the preferred policy

- Continue with the flood warning service including the maintenance of flood warning infrastructure (i.e. river flow gauging stations) and public awareness plans to improve the uptake of flood warning.
- Continue current maintenance activities.



↑ River Burn, South Creake

North Norfolk Coast

Our key partners are:

Natural England

Norfolk Coast Partnership

The issues in this sub-area

This large sub-area covers the North Norfolk Coastal area and the environmentally designated sites there (North Norfolk Coast SPA, RAMSAR, SAC, Norfolk Valley Fen SAC, Warham Camp SSSI, Marston Cliffs SSSI, North Norfolk Coast SSSI and Holme Dune NNR). Coastal flooding is the main cause of flood risk in this policy unit and this is covered by the Hunstanton to Kelling Shoreline Management Plan (SMP). The existing level of flood risk is low. Although we do not maintain any river flood defences in this sub-area, we do carry out flood risk management activities for environmental reasons. Currently, 15 properties located in this sub-area are at risk from the 1% annual probability river flood. There is no grade two agricultural land at risk of flooding in this sub-area, but there is 33% of grade three at risk in a 1% annual probability river flood. The main risk to the environment in this sub-area is to the environmental sites as well as to historical features such as listed buildings and Scheduled Monuments (SMs). Table 6 details flood risk to people and property in this sub-area.

Table 6 Risk to people and property within the North Norfolk Coast sub-area during a 1% annual probability river flood

	Current	Future (2100)
Number of people	6	6
Number of properties	15	17

The vision and preferred policy

Policy option 2: Areas of low to moderate flood risk where we can generally reduce existing flood risk management actions.

Within this coastal sub-area the current activity to manage flooding is out of proportion with the level of flood risk, or is not effective. In general, overall flood risk management activities will be reduced within the sub-area. However where flood risk is more concentrated (for example in towns and villages), or where an increase in river flooding would have a negative impact on an internationally designated conservation area, existing actions to manage flooding may be continued.

The preferred approach is to reduce bank and channel maintenance in some locations. This will enable limited resources to be targeted to other areas of the catchment where the risks are greater, to ensure value for money. We need to make sure that the way the policy is implemented in this sub-area does not cause adverse effects for internationally designated conservation sites.

Flood warning is an important way of managing the consequences of flooding throughout the catchment. Therefore, the local tidal flood warning infrastructure needs to be maintained.

The key messages

- Where feasible, flood risk management activities will be reduced as the current activity to manage flooding is out of proportion with the level of flood risk.
- Maintain tidal flood warning infrastructure to ensure that an effective tidal flood warning service can be provided throughout the CFMP area.
- The implementation of this policy must not cause adverse effects for internationally designated conservation areas.

Proposed actions to implement the preferred policy

- Investigate options to cease or reduce current bank and channel maintenance and flood defence maintenance. In addition, changes in land use, development of sustainable farming practices and environmental enhancement should be investigated to mitigate an increase in flooding in the future.
- Continue with the tidal flood warning service including the maintenance of flood warning infrastructure.
- Develop resilience and resistance projects to investigate the impact and extent of flooding on the environmental sites and also the impact of reducing maintenance on the sites.



↑ Cley Catchwater Drain, Salthouse

Cromer and Sheringham

Our key partners are:

Anglian Water

Norfolk County Council

North Norfolk District Council

Cromer Town Council

Sheringham Town Council

Highways Agency

The issues in this sub-area

This sub-area contains the urban areas of Cromer and Sheringham and the development in between at East Runton, West Runton and Beeston Regis. As there are no main rivers flowing through this sub-area and the coastline is formed by cliffs, the probability of tidal and river flood risk is low. The coastline is formed by cliffs which protect the area from tidal flooding. There is a risk to people and property from surface water flooding in Cromer and Sheringham, due to the impermeable surfaces in the urban areas and the short intense rainfall which the area is prone to.

The factors that influence the likelihood of surface water flooding include landuse, the intensity and location of rainfall and the local topography and geology. The saturation of the ground and the actual condition of the sewerage and drainage system also affect the risk.

The vision and preferred policy

Policy option 5: Areas of moderate to high flood risk where we can generally take further action to reduce flood risk.

Surface water flooding is a complex issue and we need to investigate further the sources and impacts of this risk in partnership with North Norfolk District Council and Anglian Water. Producing a study means that we can plan appropriate actions to manage the risk. For example, better information can be used to develop emergency plans to manage the consequences of surface water flooding.

The key messages

- Organisations need to work together to investigate the risk of surface water flooding.

Proposed actions to implement the preferred policy

- Work with our partners to develop a Surface Water Management Plan for Cromer and Sheringham.
- Encourage planners to develop policies to locate any new developments in the areas of lowest surface water risk. Any new development should not increase the risk from surface water flooding to existing developments.

Mundesley

Our key partners are:

North Norfolk District Council

Norfolk County Council

The issues in this sub-area

This sub-area includes the River Mun at Mundesley (also known as Mundesley Beck). There are 45 properties at risk from deep flooding. This includes three properties used for holiday accommodation and 14 chalets. Flooding could be very deep to the chalets. River flooding is made worse by backing up behind structures such as bridges. There is approximately 33% of grade two agricultural land at risk from flooding within this sub-area. The B1145 road and one electricity sub-station are at risk of flooding. There is also the risk of surface water and sewer flooding in this sub-area. Table 7 details risk to people and property within sub-area.

Table 7 Risk to people and property within the Mundesley sub-area during a 1% annual probability river flood

	Current	Future (2100)
Number of people	64	80
Number of properties	45	59

The vision and preferred policy

Policy option 5: Areas of moderate to high flood risk where we can generally take further action to reduce flood risk.

The total number of people and property at risk of flooding in Mundesley are not very high compared to other places in East Anglia. However, there is a risk to life here due to sudden, fast and deep flooding, particularly in the chalet park. Flood depths, flows and volumes are expected to increase in the future. Therefore, it is important that we take further action to reduce flood risk. For areas of Mundesley upstream of the former mill

pond the preferred approach is to undertake a study to investigate how we can reduce flood risk, with particular consideration to obstructions. For the chalet park, the preferred approach is to take immediate action to improve flood warning and awareness. This will inform residents of the risk of flooding and action they can take to protect themselves. However in the long term, the most sustainable way of reducing flood risk will be to work with planners to relocate the chalet park away from areas at risk of flooding.

The key messages

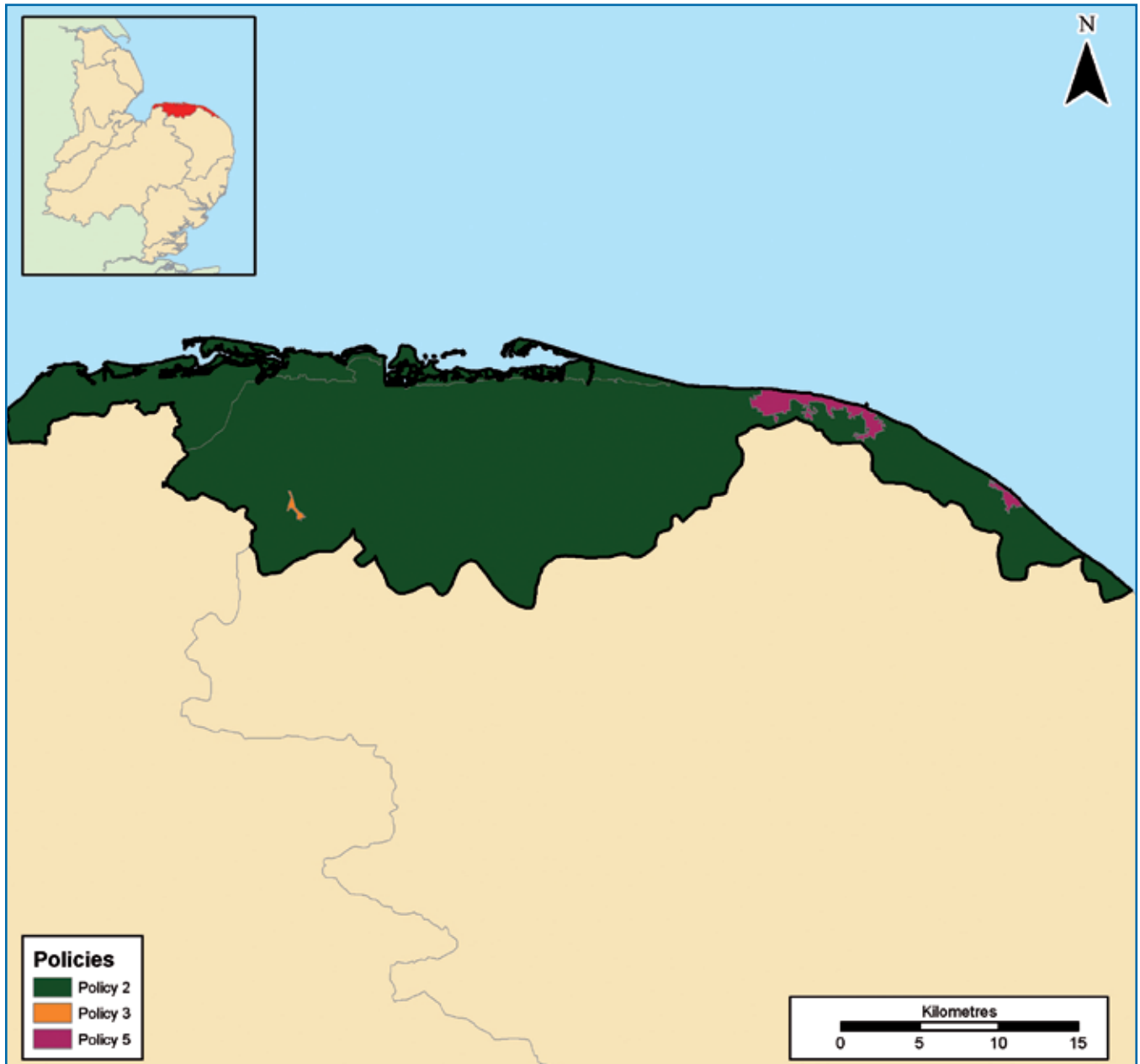
- Develop a study to investigate how flood risk upstream of the former mill pond can be reduced.
- In the short term, flood warning and flood awareness plans will be used to manage the consequences of flooding to the chalet park.
- In the long term, work with planners to relocate the chalet park away from areas at risk of flooding.

Proposed actions to implement the preferred policy

- Undertake a study to investigate how we can reduce flood risk to areas of Mundesley upstream of the former mill pond with particular consideration to river obstructions. Options considered should ensure that risk is not increased outside Mundesley.
- Work with the local authority and home-owners to relocate the chalet park away from areas at risk of flooding. Also policies should be put into the Local Development Framework to prevent further development on this site in the future.
- Improve the flood warning service and develop flood awareness plans for the chalet park. This will help to encourage people to sign up to and respond to flood warnings.
- Work with partners to develop an emergency response plan for critical infrastructure at risk of flooding.

Map of CFMP policies

Map 4 The flood risk management policies for the North Norfolk CFMP area



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