Environment Agency

Isle of Wight 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 Isle of Wight Catchment Flood Management Plan (CFMP). This CFMP gives an overview of the flood risk in the Isle of Wight catchment and sets out our preferred plan for sustainable flood risk management over the next 50 to 100 years.

The Isle of Wight 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 main source of flood risk is from river flooding, surface water and to a lesser extent, groundwater flooding. At present 185 properties are at risk to a 1% annual probability flood event (taking into account flood defences). These are concentrated in the settlements of Newport and Freshwater.

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. The key partners we have worked with are Isle of Wight Council, Southern Water, Natural England and Island 2000.

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 Southern Region.

Toby Willison
Regional Director, Southern Region

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The purpose of a CFMP in managing flood risk

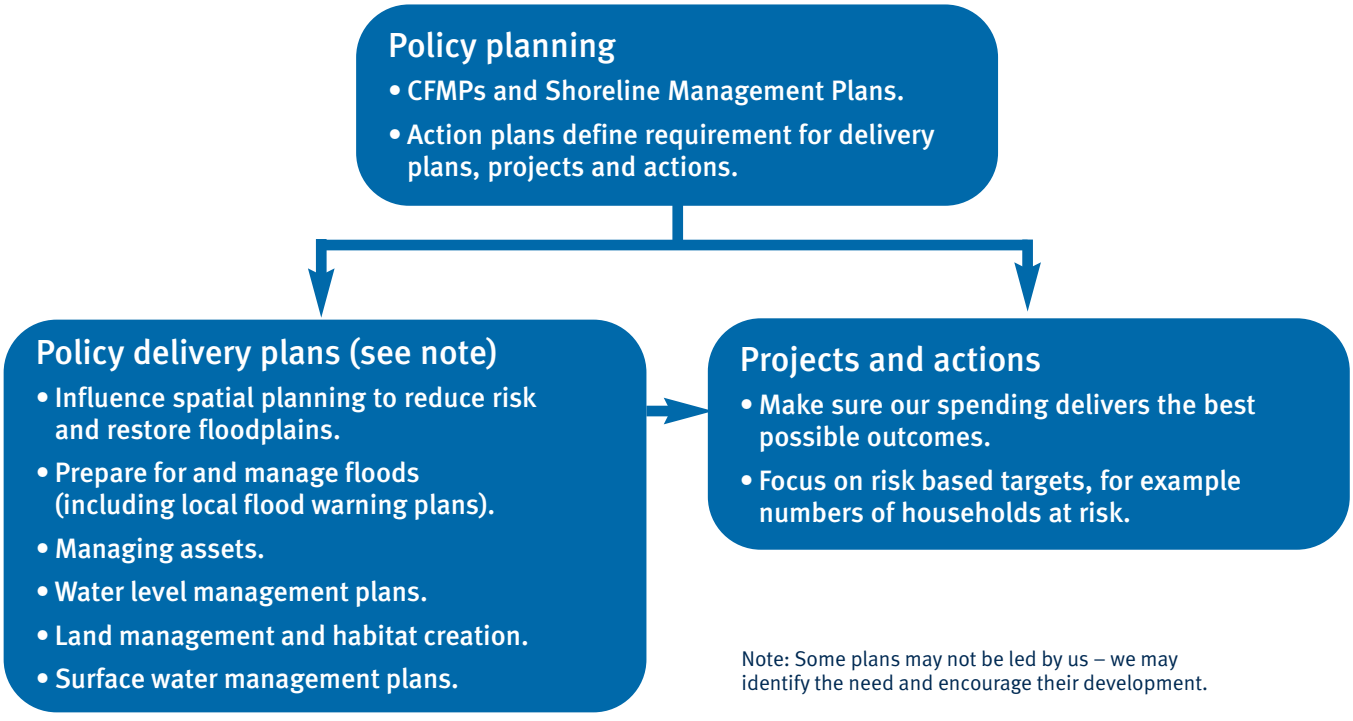
CFMPs help us to understand the scale and extent of flooding now and in the future, and set policies for managing flood risk within the catchment. CFMPs should be used to inform planning and decision making by key stakeholders such as:

- 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;
- 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.



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

Catchment overview

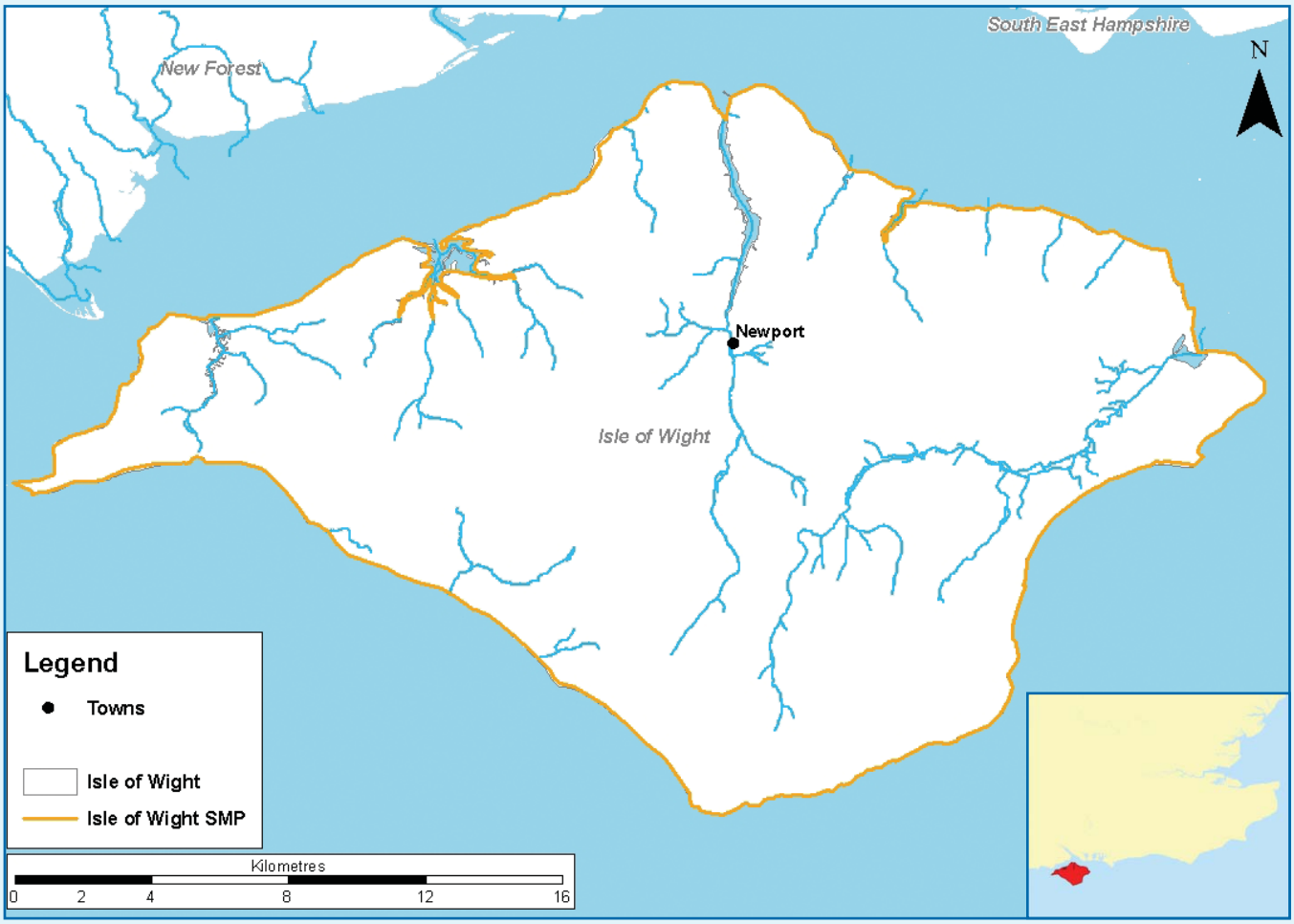
The Isle of Wight CFMP covers the combined catchments of the Isle of Wight. The permeable chalk downs that run through the centre of the island are the source of the rivers. Many of the catchments then drain over relatively flat and low lying land to the sea. With the exception of the Chines streams in the south, the rivers flow north over less permeable deposits before discharging into the international and national environmentally designated Solent. With the exception of Newport in the centre of the Island, urban development is mostly located along the coast with the inland areas of the Island predominantly rural.

The Isle of Wight contains two larger sub-catchments (the Eastern Yar and River Medina) and several smaller sub-catchments (including the Monktonmead Brook, Wootton Creek, Gurnard Luck, Thorley Brook, Western Yar, and the Chines Streams amongst others). The chalk ridge through the centre of the island has some influence on flow but water in the streams is generally derived from run-off from the catchment slopes. Land use and urban development impact on the speed with which water reaches the channel, and where the natural drainage is altered there is potential flood risk. The inability of river water to drain to the sea due to tide locking is an issue for flooding on the island.

The Isle of Wight catchment contains a range of nature conservation, landscape, and coastal heritage designated sites. Some of these sites are recognised as being of international importance and include Ramsar, Special Protection Areas (SPA) and Special Areas of Conservation (SAC) sites. Within the catchment there are also features of national importance including Sites of Special Scientific Interest (SSSI), National Nature Reserve (NNR) sites and Scheduled Monuments (SM). In addition there are also locally important sites designated as Sites of Importance for Nature Conservation (SINC), Landscape Character Areas (LCA), Local Nature Reserves (LNR) and Geological Sites (which are also designated as SSSI sites). A large part of the Isle of Wight is a nationally designated Area of Outstanding Natural Beauty (AONB).

← Looking south to Brighstone Bay.

Map 1. Overview map of the Isle of Wight.



‘The inability of river water to drain to the sea due to tide locking is an issue for flooding on the island.’

Current and future flood risk

Overview of the current flood risk

Flood risk is the combination of the likelihood of a flood occurring and the consequences caused when it does. Serious flooding does not occur very often in the Isle of Wight CFMP area, and extreme flooding is very rare. In many parts of the catchment, flooding brings environmental benefits to habitats.

We have assessed flood risk across the CFMP area using broad-scale computer modelling, though making best use of existing knowledge and models where appropriate. Flood risk figures take into account current flood defences.

The main source of flooding in the Isle of Wight CFMP area is from rivers with significant influence from tidal conditions. Risks are most significant in Ryde, Freshwater and Newport.

There have been a number of fluvial flood events over the last century, particularly on the Western Yar, River Medina, Eastern Yar and Monktonmead Brook catchments. Of those events that were recorded, instances affecting more than 10 properties appear to be fairly low.

Where is the risk?

The map on page 10 illustrates the distribution of the flood risk from rivers in the Isle of Wight CFMP area

The areas with the highest concentration of residential properties at risk from river flooding are tabulated opposite:

↑ Looking east toward The Needles and chalk downs.

How we currently manage the risk

The catchment is mainly agricultural however urban areas have developed along the coastline, the complex interactions between flooding from a number of sources means river structures and flood defences have also developed as an integral part of these towns. Existing defence infrastructure acts to defend the urban areas at risk and we are therefore looking for opportunities to revert the catchment back to its natural state. Our activity is prioritised on a risk basis and our main activities include:

- **Maintenance of existing defences and structures** such as the pumping station at Ryde on the Monktonmead Brook, and maintenance of and improvements to the channel in Newport.
- **Flood forecasting and warnings**, which are currently sent to approximately 540 properties and aim to give at least two hours lead time ahead of river flooding.
- **Development control** to influence spatial planning so that new developments are sited away from flood risk areas, or take appropriate mitigation measures.
- **Flood risk mapping** is the precursor to most flood management activities. Knowing where problems are and how frequently they occur helps us to tackle them in priority order.

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

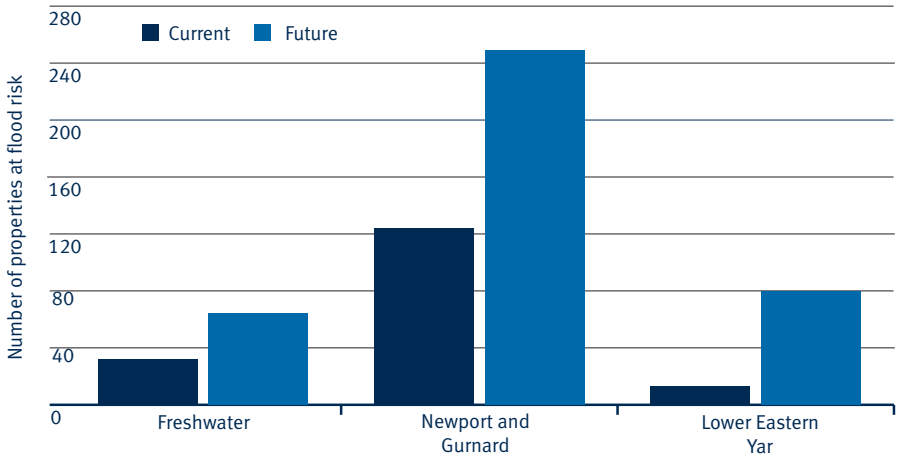
Number of properties at risk	Locations
>1000	None
500 to 1000	None
100 to 500	Lower River Medina and Gurnard Luck
50 to 100	None
25 to 50	Western Yar

Table 2. Critical infrastructure at risk:

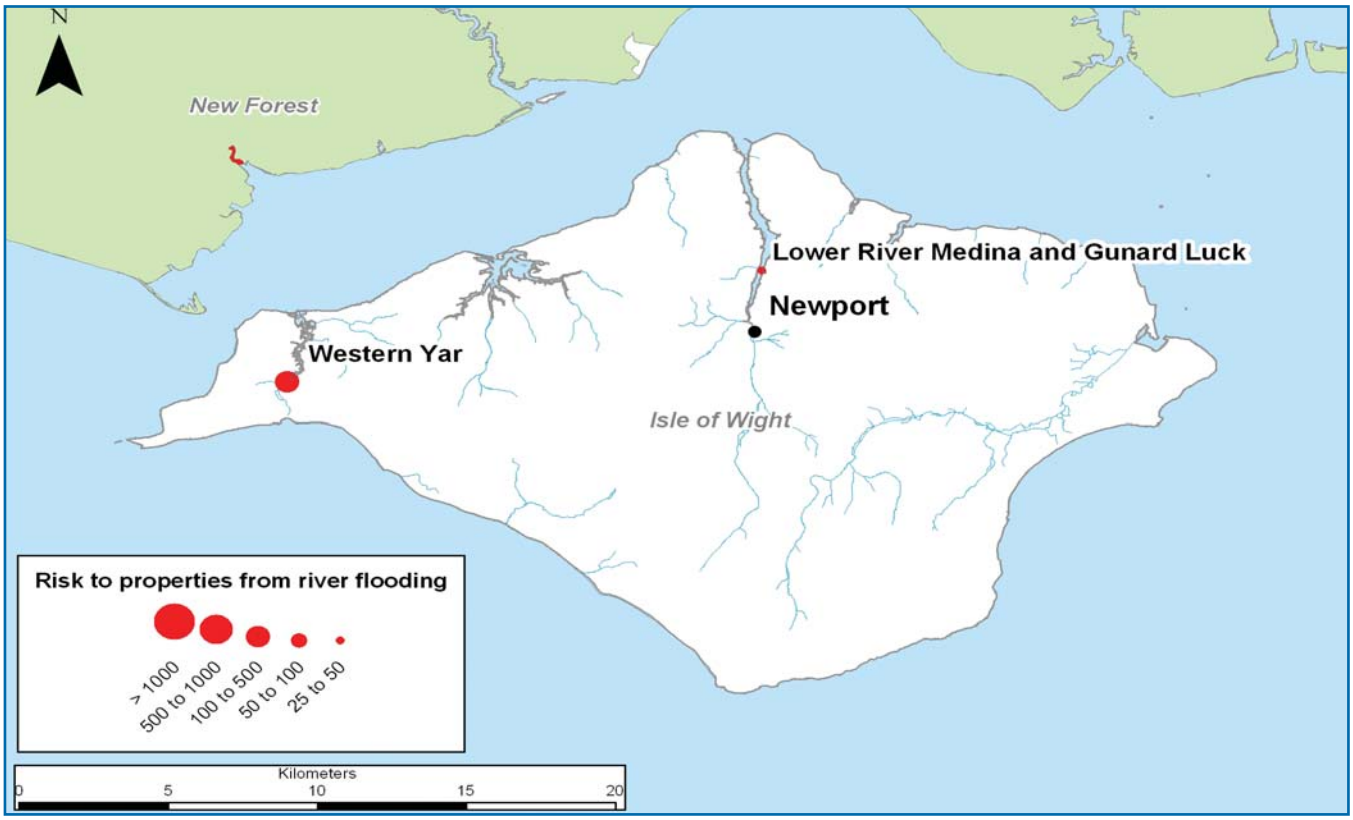
1 emergency service, 1 school, 8 electricity sub stations, 3 sewage/ water treatment works, 1 hospital/clinic

- **Strategic planning** to plan long term investment.
- **Environmental improvements** to create a healthier and more diverse place.

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



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



The impact of climate change andfuture flood risk

The effect that flooding will have in the future is influenced by a range of issues such as climate change, changes in land use such as development, and changes in how land is managed.

Predictions of future change are based on understanding the existing condition of the catchment, an extrapolation of trends over the long term (up to 100 years), and a high level review of likely future change based on research findings and knowledge. Climate change is likely to be a key driver for future increases in flood risk in the parts of the catchment that are at risk from fluvial flooding and surface drainage flooding. If the current trends in urban development continue over the planning horizon, pressure for suitable land will increase and the potential for impact on drainage will similarly increase. Land use and land management are key drivers for change in the upper parts of the catchment. These modeling results suggest that climate change and land use changes will be key risks to increased flooding of property. The results of testing the individual drivers at the catchment level show that in the future a combination of land use change and climate change will be the key drivers of change in the catchment. The largely rural nature of the CFMP catchment, with communities mainly dispersed at the downstream/coastal end of the sub-catchments means that land use change as a result of agricultural intensification can be expected to influence fluvial flooding on the island. The combined scenario selected supports the most realistic interpretation of future changes. The scenario which has the greatest effect on future flood risk is the combined scenario of land use change and climate change with up to 20% increase in peak flood flows.

This scenario is used to assess likely impacts in the catchment. In the Isle of Wight catchment the future flood risk is likely to be caused from river and surface water flooding. Our appraisal of the future risk in the catchment reveals the number of properties at risk to the 1% annual probability event will increase from 185 to 407 properties by the year 2100. The majority of these properties are located in Newport, Freshwater and Gurnard Luck.

The key trends are:

- More frequent and intense storms causing more widespread and regular flooding from drainage systems and some rivers.
- More rain in winter, increasing the likelihood of large scale flood events.

Future direction for flood risk management

Approaches in each sub-area

We have divided the Isle of Wight catchment into six 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.

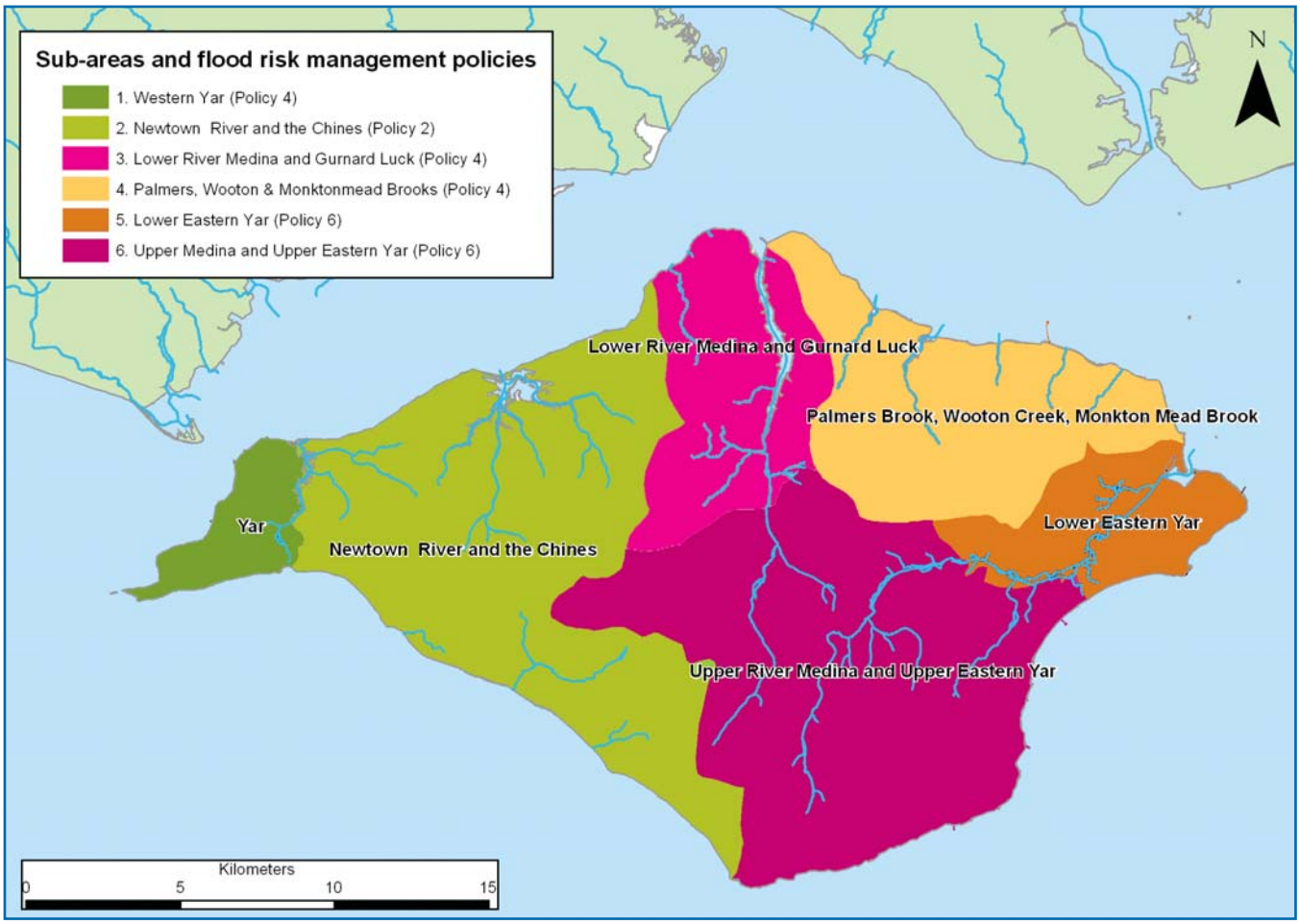


Table 3. Policy options

→ 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.

Western Yar

Our key partners are:

Isle of Wight Council

Impact of a 1% annual probability flood event

	Today	Future (2100)
Number of properties at risk	32	64

The issues in this sub-area

The key risk in this sub-area is from river flooding in Freshwater. The river channel of the Western Yar drains a small catchment which runs through Freshwater. The channel is restricted in places which can give rise to localised flash flooding. Nearer the coast, river flooding may be affected by high tide levels, which will get worse with the predicted future sea level rise. Only modest development is planned within the sub-area, however any new development could act as an additional source and/or receptor of flooding.

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 key messages

This policy applies where the current risk is acceptable but future changes are expected to have an impact. Flood risk management activities need to respond to the potential increases in flood risk.

Actions will have to be undertaken through future planning framework to local property more sensibly and allow a more open natural channel.

Proposed actions to implement the preferred approach:

- Undertake System Asset Management Plans (SAMPs) to review maintenance regimes, to assess future investment needs and to maintain current level of risk.
- Work toward improving the quality of the flood warning service (FWD - Floodline Warnings Direct) and its number of recipients particularly where the river is fast responding at Freshwater.
  - Continue to improve the integrated multi-channel warning system that provides flood warning and information to the public, professional partners and the media.
  - Continue to develop our National Flood Forecasting System which will improve our ability to forecast flooding for Freshwater.
- Investigate how a voluntary river warden rotor could be employed at Freshwater that would be responsible for raising the alarm when river levels are rising.

The Western Yar in flood. →

Newtown River and The Chines

Our key partners are:

Isle of Wight Council

Impact of a 1% annual probability flood event

	Today	Future (2100)
Number of properties at risk	Minimal	Minimal

The issues in this sub-area

There is a relatively low risk of fluvial flooding. Surface water flooding occurs in some urban areas due to the capacity of drains being exceeded. Nearer the coast, river flooding may be affected by high tide levels, which will get worse with predicted future sea level rise. Only modest urban development is planned.

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.

The key messages

The chosen policy supports economic and social sustainability by prioritising significant gains elsewhere with the acceptance of some potential for future minor losses within the sub-area.

Proposed actions to implement the preferred approach:

- Undertake System Asset Management Plans (SAMPs) to review maintenance regimes.

↑ Looking south across sub-area towards Brighstone Bay.

Lower River Medina and Gurnard Luck

Our key partners are:

- Isle of Wight Council
- Island 2000
- Southern Water

Impact of a 1% annual probability flood event

	Today	Future (2100)
Number of properties at risk	124	249

The issues in this sub-area

The River Medina and Gurnard Luck can flood from a number of causes. Both rivers are responsive to rainfall and both are affected by tide locking. Potential flood levels at Newport and Gurnard are particularly sensitive to future sea level rise due to a number of low lying properties.

The scale of flood risk in this sub-area is such that estimated property damages are relatively high in comparison to other parts of the catchment because of the significant population in the catchment. The relatively high number of properties at risk means that flood risk management activities are employed and existing defences which protect Newport and Gurnard need to be maintained.

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 key messages

This policy applies where the current risk is acceptable but future changes are expected to have an impact. Flood risk management activities need to respond to the potential increases in flood risk.

↑ Newport and the River Medina.

Proposed actions to implement the preferred approach:

- Continue the Lukely Brook Newport Channel Works, supporting the programme of work being carried out. This will include reinstating where possible the natural channel on the Lukely Brook and to improve fish passage without increasing flood risk through the Westminister Mill. It may also include work resulting from the River Medina Newport Feasibility Study.
- Develop System Action Management Plans (SAMPs) to review maintenance regimes, to assess future investment needs and to maintain current level of risk.
- Encourage the take up of flood resilience measures by people living within the floodplain.
- With reference to the Pan development east of Newport, Planning Policy Statement 25 (PPS25) and the Strategic Flood Risk Assessment (SFRA) should be followed to avoid inappropriate development in the floodplain and to influence development to effectively manage flood risk. Sustainable urban Drainage Systems (SuDs) will be a part of this development.

← Tide locking at Gurnard Bridge, Gurnard Luck.

Palmers Brook, Wootton Creek and Monktonmead Brook

Our key partners are:

Isle of Wight Council

Natural England

Impact of a 1% annual probability flood event

	Today	Future (2100)
Number of properties at risk	14	14*

* the pumping station at Ryde is to be maintained into the future at current level of risk.

The issues in this sub-area

This sub-area covers the Palmers Brook, Wootton Creek and Monktonmead Brook catchments and the smaller streams in the north west of the Isle of Wight. This area is largely rural in nature, but notably contains the town of Ryde, the largest urban centre on the Island. Flood flows in the sub-area largely occur on Monktonmead Brook and the risk of flooding elsewhere is limited. These flows can result in relatively fast rises in river discharge and flood events that pass relatively quickly. Flooding in Ryde results from rainfall run-off over predominantly impermeable surfaces combined with tide locked fluvial flows. The pumping station in Ryde helps to evacuate flows during tide locked periods and provides the town a 1% probability standard of protection.

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 key messages

This policy applies where the current risk is acceptable but future changes are expected to have an impact. Flood risk management activities need to respond to the potential increases in flood risk.

Ryde railway station. →

Proposed actions to implement the preferred approach:

- Develop System Action Management Plans (SAMPs) to review maintenance regimes, to assess future investment needs and to maintain current level of risk.
    - Climate change in the future will require improvements to the capacity of the pumping station at Ryde to maintain a 1% (1 in 100 year) standard of protection.
- With reference to development in Ryde and elsewhere in the policy unit, Planning Policy Statement 25 (PPS25) and the Strategic Flood Risk Assessment (SFRA) should be followed to avoid inappropriate development in the floodplain and to influence development to effectively to effectively manage flood risk.
- The implementation of the Wootton Creek (with Ryde Sands) Water Level Management Plan to meet the needs of flood risk management and the enhancement of wetland habitat. This action should compliment and maintain links with the outcomes of the *Isle of Wight Shoreline Management Plan*.
- Encourage the take up of flood resilience measures by people living within the floodplain.
- Work toward improving the quality of the flood warning service (FWD - Floodline Warnings Direct) and its number of recipients.

Lower Eastern Yar

Our key partners are:

- Isle of Wight Council
- Natural England
- Island 2000

Impact of a 1% annual probability flood event

	Today	Future (2100)
Number of properties at risk	13	80

The issues in this sub-area

This sub-area covers the lower section of the Eastern Yar catchment from Alverstone to its mouth at the tidal sluice at St. Helens. The tidal defence at Embankment Road stops seawater from travelling up the river and allows a freshwater habitat upstream. The subject of the coastal defence line is being considered under the ongoing Eastern Yar fluvial and coastal strategy.

Flood flows in the policy unit largely result from overbank flooding of fluvial flows which spill out onto the floodplain. The downstream end of the catchment is protected from tidal ingress by a tide locked sluice, however this can lead to tide locked fluvial flooding. In addition there have also been incidents of surface water drainage flooding and a very limited amount of groundwater flooding.

The area is largely rural in nature and contains a number of villages including Bembridge, St. Helens, Brading, and Alverstone. There are two designated sites at Brading Marshes and Alverstone Marshes which require flooding to maintain their status.

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.

Proposed actions to implement the preferred approach:

- Develop System Action Management Plans (SAMPs) to review maintenance regimes.
- The implementation of the Brading Marshes and Alverstone Marshes Water Level Management Plan to meet the needs of flood risk management and the enhancement of wetland habitat and species.
- A co-ordinated action to support the outcomes of the Eastern Yar fluvial and coastal strategy.

The tidal sluice on the Eastern Yar, Bembridge. ➜

Upper Eastern Yar and Upper River Medina

Our key partners are:

Isle of Wight Council

Natural England

Impact of a 1% annual probability flood event

	Today	Future (2100)
Number of properties at risk	6	Minimal change

The issues in this sub-area

This sub-area covers the upper sections of the Eastern Yar catchment from Alverstone to its source, and the upper sections of the River Medina from Blackwater to its source. The area is largely rural in nature, and contains a number of villages including Wroxall and Whitwell. Flood flows in the sub-area result from either overbank flooding of fluvial flows or surface water drainage flooding.

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 key messages

This policy applies where the current risk is acceptable and action can be taken to increase the frequency of flooding to deliver benefits locally or elsewhere. Proposed actions to implement the preferred approach.

Proposed actions to implement the preferred approach:

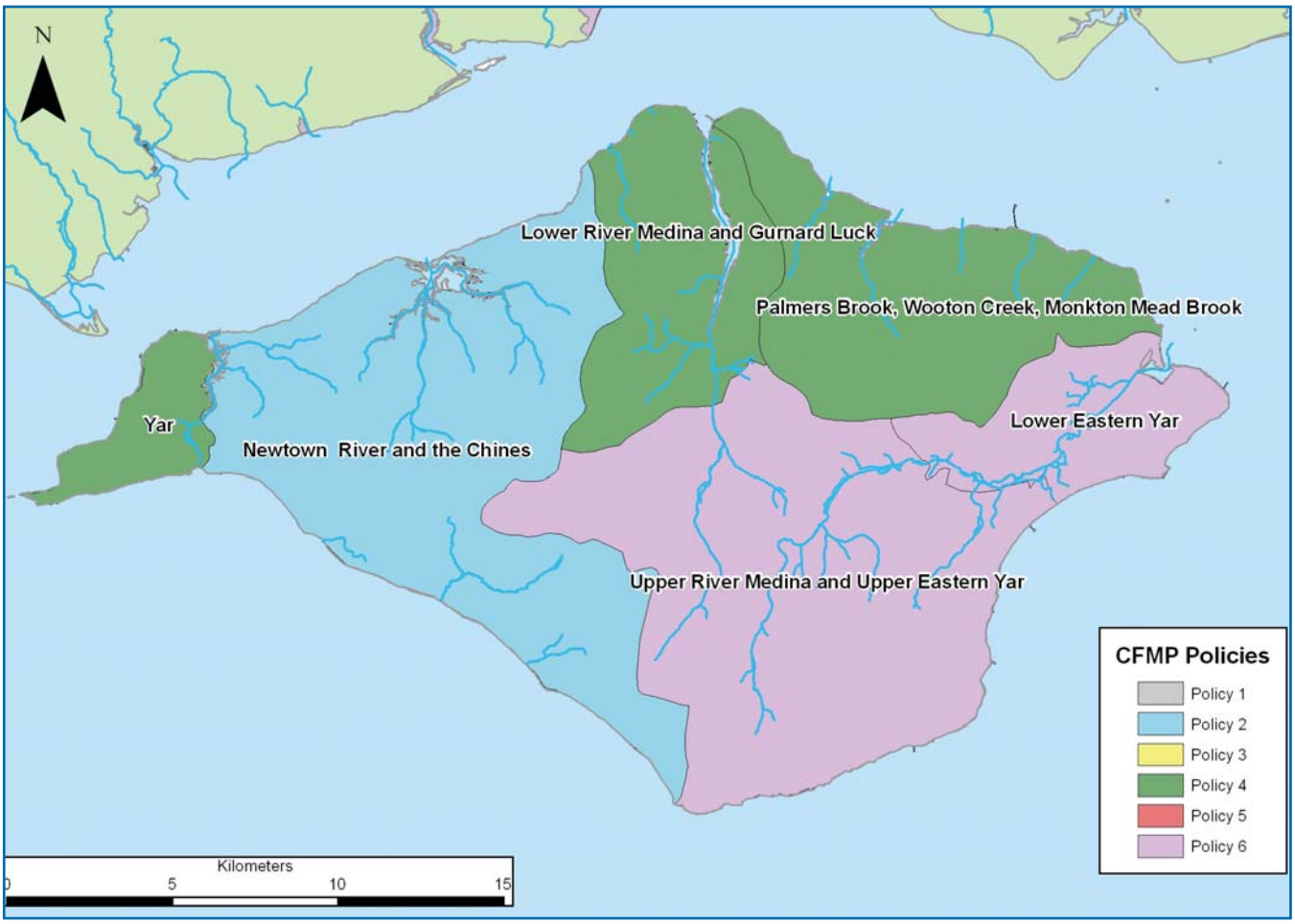
- The implementation of the Water Level Management Plan at Cridmore Bog and the Wilderness to meet the needs of flood risk management and the enhancement of wetland habitat.

Alverstone Bridge, Eastern Yar. ➜

  - Any potentially damaging works forthcoming under this policy will be subject to Habitats Regulations Assessment.
- Undertake System Asset Management Plans (SAMPs) that will benefit sustainable conveyance and provide the opportunity for environmental and flood risk benefit to upland villages.
- A co-ordinated action to support the outcomes of the Eastern Yar fluvial and coastal strategy. The strategy is a joint Environment Agency and Isle of Wight Council project that will identify the best way to manage flood and erosion risk in the Eastern Yar Valley over the next 100 years.
  - Monitor future action within the policy unit and inform on any fluvial aspects of the project outcome.
  - Support future minor works identified by the Eastern Yar fluvial and coastal strategy including the drainage improvements at Wroxhall and Whitwell.

Map of CFMP policies

Map of the policies in the Isle of Wight catchment.



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