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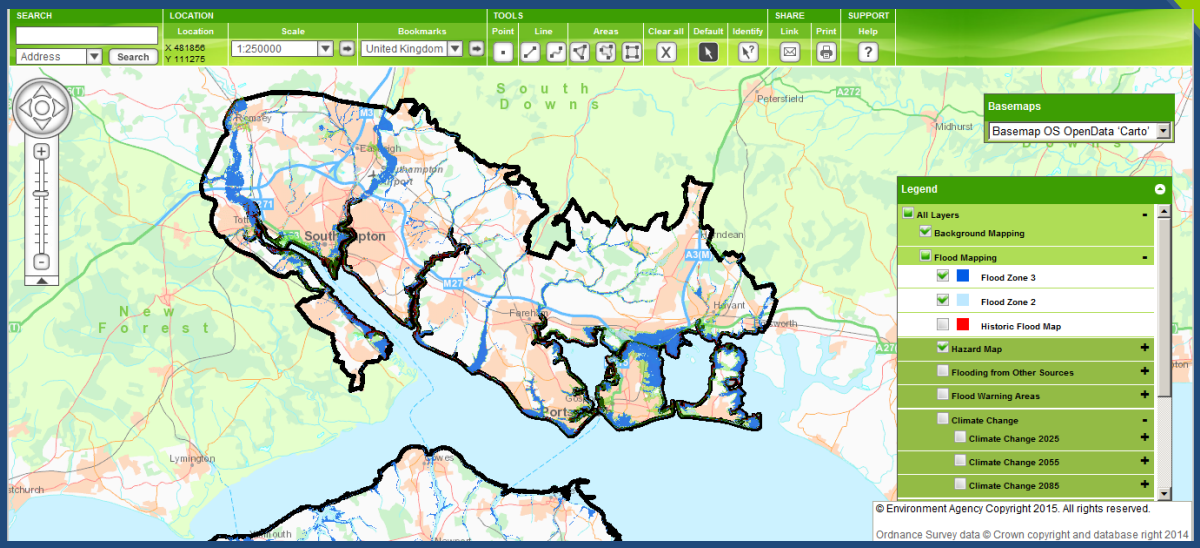
Strategic Flood Risk Assessment 2016 Update

February 2016



Undertaken on behalf of PUSH by:

EASTERN SOLENT | COASTAL PARTNERSHIP

Partnership for Urban South Hampshire Strategic Flood Risk Assessment (SFRA) Update - 2016

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This report describes work commissioned by the Partnership for Urban South Hampshire by a letter dated insert. PUSH's representative for the contract was Gloria Ighodaro. James Addicott of the Eastern Solent Coastal Partnership project managed this work.

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PUSH SFRA REVIEW 2015 CONTENTS

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I Executive Summary

Introduction

In 2007, a Strategic Flood Risk Assessment (SFRA) was commissioned by PUSH and undertaken by Atkins on behalf of the partner authorities to inform the development of the South East Plan and partner authority Local Plans. The final report was delivered in December 2007 and has subsequently been hosted by Hampshire County Council.

A light touch review and was undertaken in 2012 at which time small amendments were made to the GIS deliverables. As some time has passed since the initial reporting was delivered, the SFRA evidence base is being revised to ensure that it provides a robust, contemporary and sound analysis of flood risks from all sources.

The Planning Framework

Since the time of publication relevant planning policy and guidance has evolved with the introduction of the National Planning Policy Framework (NPPF) and the National Planning Practice Guidance (NPPG).

The legislative context behind flood and coastal erosion risk management has also changed through the Flood and Water Management Act 2010, in addition to a number of locally and nationally significant flood events and revisions to local flood mapping techniques and advice. This report updates the SFRA to reflect those developments.

SFRA Review

The primary objective of the revised PUSH SFRA is to inform and provide an evidence base for the:

- preparation and evidence for the evolving PUSH South Hampshire Strategy to 2036
- emerging Local Plans in respect of the development and of policies for the allocation of land for future development.
- review of policies related to flood risk management for all Risk Management Authorities

The SFRA also has a broader purpose and provides a depiction of flood risk across the area from all sources and in one location. If reviewed regularly and kept up to date it has the potential to:

- Inform the development of planning policy that will underpin decision making within all partners authorities, particularly within areas that are affected by (and/or may adversely impact upon) flooding;

- Assist the development management process by providing a more informed response to development proposals which may be affected by flooding, allowing for appropriate locations and uses taking account of flood risk ;

- Seek to identify partnership opportunities and strategic solutions to flood risk, providing the basis for possible future flood attenuation works by a range of agencies with responsibility for flood risk management;

- Support risk management authorities in the discharge of their duties, identifying critical flood risk areas and providing evidence to assist future infrastructure planning and investment decisions;

- Support and inform the partner authorities' emergency planning response to flooding.

This update report forms a Stage 1 SFRA and addresses the requirements of the Sequential Test, which will assist the council to guide development to areas of lower flood risk. Each of the partner authorities are progressing their Local Plan delivery on different timescales and use this SFRA evidence base to support decision making or to identify the need for more in depth information

Dependent on local risks and likelihood of allocating sites in areas of flood risk, there may be a requirement for the individual partner authorities to prepare a Stage 2 SFRA to address the requirements of the Exception Test.

Data Collection and Methodology

The following actions have been undertaken to assess flood risk within the PUSH area:

- Identification of Flood Risk Zones 3 and 2 of flooding from rivers and the sea (from the Environment Agency flood map)

- Identification of locations of flood risk from other local sources (including ordinary watercourses, surface water groundwater, sewers and reservoirs);

- Consideration of the impact of climate change upon flood risk within the PUSH area and mapping of these impacts where available;

- Identification of existing flood risk management assets and the areas benefiting from a level of protection provided by such assets and potential consequences should they fail.

The SFRA also provides guidance for developers when undertaking a requisite site specific Flood Risk assessment.

This document is the final SFRA report, which summarises the background and policy for the development of SFRAs, the guiding principles for undertaking a SFRA, the outputs of the SFRA and strategic flood risk management guidance for the LPA.

Appendix C to this report contains individual Guidance Documents for each of the LPAS which have been developed to assist local authority planners and the Environment Agency when allocating future development sites in line with the NPPF and when specifying the requirements for and assessing the compliance of site specific FRAs.

The content of the Guidance Documents for each LPA is bespoke to the types of flood risks present within each administrative boundary. The Guidance Documents aim to promote the use of the SFRA and its deliverables by:

• Summarising the key findings of the SFRA, tailored for the specific flood risks found in each Local Planning Authority area.

• Providing data and information to support site-specific FRAs.

Recommendations and Actions

Finally the report also provides guidance on how this updated SFRA should be monitored and reviewed in future to ensure it remains contemporary and fit for purpose. The outputs of this piece of work also link to reviewed and updated mapping which are hosted on an online GIS viewer from the following link:

http://maps.hants.gov.uk/push/

II Abbreviations and Glossary of Terms

To be inserted

III Disclaimer

It is important to recognise that the information provided within the SFRA comprises the best available data at the time of writing (April 2015). The mapping of flood risk is not an exact science, and there may be some uncertainties in the information presented.

This SFRA is a strategic level document intended to support the spatial planning process. In line with the NPPF this SFRA recommends that more detailed site-specific Flood Risk Assessments should be undertaken when future development is being considered (following application of the Sequential Test). A site-specific FRA will improve the level of accuracy and look in greater detail at flood extents from a local perspective.

1.0 Introduction

This document has been prepared as a revision to the Partnership for Urban South Hampshire (PUSH) Strategic Flood Risk Assessment (SFRA) report originally compiled by Atkins in December 2007.

The purpose of this document is to provide a robust, contemporary and sound analysis of flood risks from all sources and to provide up to date evidence base of flood risk information. The review aims to provide confidence that the SFRA is up to date, fit for purpose and provides a sound evidence base to underpin decision making on proposed allocations for housing and employment, which can be delivered within the context of flood risk.

The original SFRA was published following a series of workshops with client authorities held throughout 2007. This review sought the views of client authorities by email and teleconferences held throughout early 2015. This update work has also included significant data collection including verifying the current Environment Agency flood maps covering tidal, fluvial and surface water flooding and local and historic knowledge held by district authorities.

This report has been prepared by the Eastern Solent Coastal Partnership on behalf of PUSH with the support of officers from the Environment Agency, lead local flood authorities and district authorities within PUSH.

1.1 Overview and Context in PUSH

The Partnership for Urban South Hampshire (PUSH) is situated on the South Coast of England within the County of Hampshire.

The PUSH area extends approximately from Romsey in the west, to Emsworth in the east and includes the three unitary authorities of Southampton, Portsmouth and the Isle of Wight. The region is also interspersed with smaller conurbations including Romsey, Eastleigh, Totton, Fareham, Gosport and Havant in addition to other urban areas and villages.

PUSH is a partnership of:

Hampshire County Council; Isle of Wight, Portsmouth and Southampton; and district authorities of:

Eastleigh, East Hampshire, Fareham, Gosport, Havant, New Forest, Test Valley and Winchester.

The partner authorities to which this SFRA review refers are included within the boundary map in figure 1. The Solent area is a key economic hub with a population of more than 1.3 million and over 50,000 businesses.

Figure 1: Partnership for Urban South Hampshire Boundary Map

It should be noted that the remaining portions of the partner authorities that are bisected by and lie outside of the PUSH boundary have also had additional strategic flood risk assessment work undertaken. This has been signposted from section 2.7 of this report and an updated layer has been incorporated describing other relevant strategic plans and policies. The links to additional authority specific Strategic Flood Risk Assessment advice can be found in Appendix B.

Further to the publication of the new South Hampshire Strategic Housing Market Assessment (SHMA), preparation to review the current South Hampshire Strategy to 2036 is underway which will aim to bring together the evidence in the SHMA with a range of other factors to consider what level of development should be planned for across the PUSH area. The output of this review will include a PUSH Spatial Strategy 2016-2036 to update the existing South Hampshire Spatial Strategy 2012.

This will involve detailed joint work to assess the availability of land that can sustainably accommodate development, environmental constraints and impacts, economic development and employment analysis, along with infrastructure capacity and consideration of what new infrastructure might be needed. This Strategic Flood Risk Assessment is part of this evidence review.

The current South Hampshire Strategy provides an up-to-date and robust strategic framework for local plan preparation and other decision-making by PUSH authorities and their partners up to 2026. It is based on, and will help implement, the PUSH Economic Development Strategy. It aims to provide for the Economic Development Strategy's forecast employment floorspace and housebuilding requirements which are the most up-to-date assessment of development requirements across South Hampshire as a whole.

In combination, the document's policies and proposals will help maximise economic growth, help bring about a renaissance of Portsmouth, Southampton and other urban areas, and help ensure affordable family home and good quality jobs for all.

1.2 SFRA Strategic Background

The role of a SFRA is clearly defined in the NPPF as an assessment that is intended to inform the suite of Local Development Documents, feed into the sustainability appraisal and to inform the site allocation process in relation to flood risk.

The need for LPAs to prepare SFRAs is outlined in NPPF and the generic objectives state that a SFRA should:

- Be developed in consultation with the Environment Agency;
- Provide the information needed by LPAs to apply the sequential approach to site allocations;
- Refine information on the probability of flooding, taking other sources of flooding and the impacts of climate change into account;
- Determine the variations in flood risk from all sources of flooding across and from their area;
- Consider the impact of the flood risk management infrastructure on the frequency, impact, speed of onset, depth and velocity of flooding within the Flood Zones considering a range of flood risk management maintenance scenarios;
- Consider the beneficial effects of flood risk management infrastructure in generally reducing the extent and severity of flooding when compared to the Flood Zones on the Flood Map.

1.3 Requirement for Review and Update

The original SFRA was produced by PUSH on behalf of its partner authorities to inform the development of the South East Plan and Local Plans in December 2007.

Since the original publication of the PUSH SFRA in 2007 relevant planning policy and guidance has evolved with the introduction of the National Planning Policy Framework (NPPF) and the National Planning Practice Guidance (NPPG).

The legislative context behind flood and coastal erosion risk management has also changed through the Flood and Water Management Act 2010, in addition to a number of locally and nationally significant flood events and revisions to local flood mapping techniques and advice. This report updates the SFRA to reflect those developments.

A light touch review and was undertaken in 2012 when a number of minor amendments were made to the GIS deliverables. As some time has passed since the initial reporting was delivered, the SFRA evidence base is being revised to ensure that it provides a robust, contemporary and sound analysis of flood risks from all sources.

In addition to the PUSH Spatial Strategy review, partner authorities are also undertaking their own Local Plans in accordance with the Town and Country Planning (Local Planning) (England) Regulations 2012.

This updated SFRA will provide the data and information to allow local planning authorities within the PUSH sub-region to assess whether sites proposed to be allocated for development in areas of flood risk, are appropriate in the context of the Sequential and Exception Tests, which are required as part of the National Planning Policy Framework (NPPF) and its accompanying National Planning Practice Guidance (NPPG).

1.4 Partnership and Collaboration

Project steering Group

A Project Steering Group was set up to provide direction to the SFRA review. The members of the project steering group were identified as they represented a broad range of end users of the work and included representatives from:

- Environment Agency;
- Lead Local Flood Authority partners;
- Local Authority Planning – Forward Planning and Development Control;
- Emergency Planning Officers;
- PUSH Planning and Infrastructure Panel;
- Flood risk managers.

Although not involved with this project on the steering group, end users including developers and consultants were also requested to undertake an end-user test of the revised SFRA GIS layers to test that the data presented was clear and intuitive and included flood risks from all sources that they required. Feedback from this exercised was used to improve the final GIS product.

Stakeholder Consultation

During the preparation of this PUSH SFRA update, the following stakeholders were contacted to provide data and information:

- Hampshire County Council,
- Isle of Wight Council,
- Portsmouth City Council
- Southampton City Council
- Southern Water;
- Eastern Solent Coastal Partnership
- Channel Coastal Observatory
- Environment Agency, South East, Solent and South Downs

The Study Area falls entirely in the Environment Agency's South East Region, Solent and South Downs area. Southern Water is the sewerage undertaker for the entire PUSH area as is therefore responsible for storm and foul sewer management.

The Eastern Solent Coastal Partnership

The Eastern Solent Coastal Partnership were commissioned in January 2015 to project manage and undertake a detailed review of the SFRA as they have been providing support to enquiries regarding the evidence base since 2007 and were members of the project team previously involved with the development of the 2007 PUSH SFRA.

The Eastern Solent Coastal Partnership formed an alliance in 2012 to deliver a combined, efficient and comprehensive coastal management service across the coastlines of four Local Authorities including: Havant Borough Council, Portsmouth City Council, Gosport Borough Council and Fareham Borough Council. The partnership has combined coastal engineers from each authority into one team to manage the 162km of coastline across the Solent.

The overarching vision of the ESCP initiative is to reduce the risk of coastal flooding and erosion to people, the developed and natural environment by encouraging the provision of technically, environmentally and economically sustainable coastal defence and protection measures.

2 Legislative Framework

Since the original publication of the PUSH SFRA in December 2007, there have been a number of changes to the planning system, regulations and law, which need to be incorporated into the document including;

- National Planning Policy Framework (NPPF) (2012)
- Planning Practice Guidance (March 2014).
- Flood and Water Management Act (2010)
- Flood Risk Regulations (2009)
- Localism Act (2011)

The project has explored and implemented all actions satisfactorily in order to confirm that the content of the SFRA documentation and supporting mapping platform is fit for purpose and provides an up to date, credible and robust dataset on which to base decisions regarding housing allocations and infrastructure investment.

The review ensures that the document is compliant with recent legislative and policy updates

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) provides national planning guidance in relation the assessment of flood risks when considering development sites in areas at risk of flooding.

The National Planning Practice Guidance also provides more technical detail on the use of the Sequential and Exception Tests and sets out how flood risk should be considered throughout the planning process.

Both the NPPF and Practice Guidance emphasise the responsibility of Local Planning Authorities (LPAs) to ensure that flood risk is understood and managed effectively at all stages of the planning process by using a risk-based approach.

The NPPF and supporting guidance require LPAs to undertake SFRAs either individually or in partnership, and to use their findings, and those of other studies, to inform strategic land use planning.

The key policy message is to guide new development to areas with the lowest probability of flooding applying the Sequential and Exception Tests as appropriate. Where it is not possible to locate new development to areas of lower flood risk, then any possible risks must be carefully managed through the use of suitable adaptation and mitigation measures.

This SFRA review has been prepared in accordance with the principles set out in the NPPF and supporting guidance.

The Planning Practice Guidance advocates a tiered approach to risk assessment and identifies the following two levels of SFRA. The objectives of this SFRA update are a hybrid of level one and level two and have been tailored to meet the needs to of the sub-region and partner authorities.

The Sustainability Appraisal is the tool for assessing the sustainability of sites. It has not been necessary to undertake environmental assessment for this work where it presents flood risk evidence.

2.2 National Flood Legislation and Policy

Since the 2007 PUSH SFRA was completed, updates to flood legislation and policy have been implemented. This section highlights the main changes and the impacts that flood and coastal erosion risk management policy have had on the SFRA and the way in which these have been addressed. Each of these give strength to the objectives of undertaking this SFRA review and update to support a commitment to implementing the recommendations to improve our flood risk management approach and prevent inappropriate development in areas of high flood risk.

The national and international legal framework behind the approaches used in managing flood and coastal erosion risks include:

The Flood and Water Management Act (FWMA) - provides legislation on FCERM, including the development of a national strategy for FCERM and local strategies.

The FWMA also brings in new roles and responsibilities for local authorities. In particular, the Act defines the role of the Lead Local Flood Authority (LLFA), which includes Unitary Authorities or County Councils. LLFAs are encouraged to bring together relevant bodies and stakeholders to effectively manage local flood risk.

The new responsibilities that the Act assigns to LLFAs include:

- Coordinated management of flooding from surface water, ground water and ordinary watercourses including consenting and enforcement provisions;
- Development and maintenance and implementation of Local Flood Risk Management Strategies;
- Investigation and recording of local flood events; and
- Establishment and maintenance of a Flood Risk Asset Register.

Flood Risk Regulations The Regulations transpose the EU Floods Directive (2007/60/EC) into UK Law to complement the Flood and Water Management Act. The Regulations set out a six-year cycle of activities to understand and manage risk in line with the Floods Directive.

The Flood Risk Regulations came into force in December 2009 and set duties for the Environment Agency and LLFAs in the preparing of a range of reports and mapping and one of the main impacts is the requirement for LLFAs to prepare Preliminary Flood Risk Assessment (PFRAs).

Where Flood Risk Areas are defined within the PFRA Flood Risk Maps showing the extents and hazards of flooding are required to be produced alongside Flood Risk Management Plans.

All of the Lead Local Flood Authorities within the PUSH areas completed their PFRAs in 2011.

National Flood and Coastal Erosion Risk Management (FCERM) Strategy

A National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in England has been produced by the Environment Agency. This strategy provides a overarching framework for the work of all flood and coastal erosion risk management authorities in England and sets out:

- the flood and coastal erosion risks
- a national framework and principles for flood risk management
- the roles and responsibilities of various authorities
- how flood risk management work is funded
- the need to develop local solutions to flood risks
- a requirement to produce Flood Risk Management Plans (FRMPs)

The Environment Agency has a strategic overview of the management of all sources of flooding and coastal erosion distinct from the operational function it has in relation to managing flood risk from main rivers and the sea. The strategy seeks to provide a clear national framework for flood and coastal erosion risk management, with all sources of flooding and coastal erosion identified and managed using a risk-based approach, allowing local responsibility and decision-making where appropriate. It also aims to ensure that the roles and responsibilities of those managing risk are defined and understood; that all involved, including communities at risk, know what they need to do; and that progress is monitored and understood.

The Government, the Environment Agency, local authorities, water companies, internal drainage boards and other organisations all have a role to play in FCERM and the national strategy aims to raise awareness of each others' roles and co-ordinate how they manage risks.

The diagram below is extracted from the national FCERM Strategy and describes these interactions.

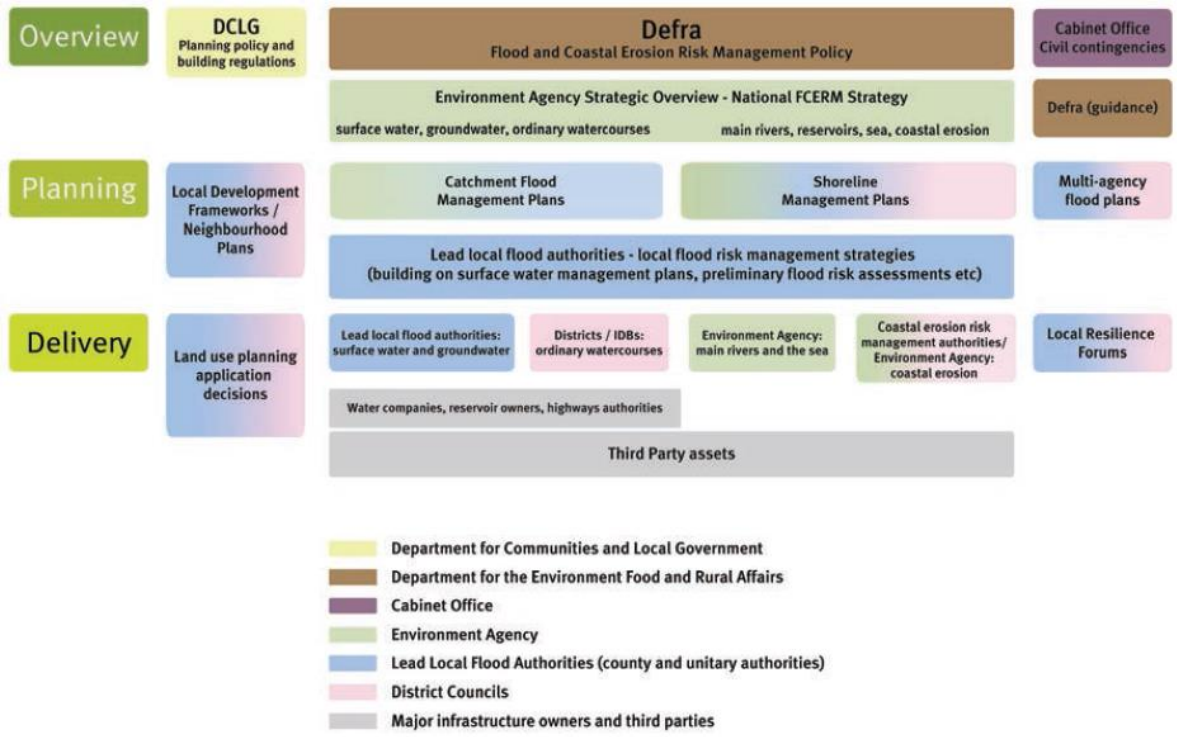

Figure: Flood and Coastal Erosion Risk Management Overview (source The National Flood and Coastal Erosion Risk Management Strategy for England, 2011)

All of the organisations listed above should use the national strategies to help coordinate their work in partnership with communities. Using the strategy, all stakeholders should work to:

- manage the risk of flooding and coastal erosion to people and their property thereby improving standards of protection over time
- help householders, businesses and communities better understand and manage the flood and coastal erosion risks they face
- respond better to flood incidents and during recovery, and to coastal erosion.
- move the focus from national government-funded activities towards a new approach that gives more power to local people, either at an

individual, community or local authority level. Local innovations and solutions will be encouraged too

- invest in actions that benefit communities who face the greatest risk, but who are least able to afford to help themselves
- put sustainability at the heart of the actions taken so that work is undertaken with nature and benefits the environment, people and the economy.

The Pitt Review

This Pitt Review was published in 2008 identifying the lessons learned following the devastating national floods of 2007.

In total the review provided 92 recommendations for improving the way flood risk is managed in England, focusing on six key aspects of flood risk management. It also offered a greater focus than previous on surface water flooding - a main cause of damage in the 2007 floods.

Some of the key recommendations of the Pitt Review include to:

- provide the Environment Agency with a wider brief, taking on the national overview for all forms of flooding, ask councils to strengthen their technical ability to take the lead on local flood risk management, and that more should be done to protect communities through robust building and planning controls;
- improve the quality of flood warnings through closer co-operation between the MetOffice and the Environment Agency, and improved modelling of all forms of flooding;
- improve incident management by ensuring that emergency services and other organisations work in partnership through better preparation and planning;
- improve planning and protection for critical infrastructure to avoid the loss of essential services such as water and power. Private sector companies must also be more closely involved in planning to keep people safe in the event of a dam or reservoir failure;
- provide more clear advice around risk;
- provide better advice so that people can protect their families and homes more effectively and that they are more aware of flooding;
- maintain people's health and speed up the recovery process after a flood, giving people the earliest possible chance to get their lives back to normal.

Flood Risk Standing Advice

Standing Advice is a tool to help local planning authorities (LPAs) establish the level of flood risk involved with planning applications. It also helps LPAs to deal with low risk applications without the need to consult the Environment Agency (EA) directly. Standing advice is now hosted on the .gov.uk webpages.

The Climate Change Act (2008) - requires a UK-wide climate change risk assessment every five years accompanied by a national adaptation programme that is also reviewed every five years. The Act has given the Government new powers to require public bodies and statutory organisations such as water companies to report on how they are adapting to climate change.

The Water Framework Directive (2000/60/EC) and Floods Directive (2007/60/EC) - require consolidated river basin management planning, assessment and mapping of hazards and risks, and preparation and use of flood risk management plans. The frameworks set out in the directives closely match those already applied in the UK.

Civil Contingencies Act 2004 (CCA) – Legislation that aims to provide a single framework for civil protection in the United Kingdom and sets out the actions that need to be taken in the event of a flood. The CCA is separated into two substantive parts: local arrangements for civil protection (Part 1) and emergency powers (Part 2).

2.3 Local Flood Plans and Policies

Preliminary flood risk assessment (PFRA) –

PFRAs were undertaken by lead local flood authorities for the first stage of the Flood Risk Regulations 2009. The preliminary assessment reports assemble information on past flooding and potential future flooding and its consequences to inform the identification of flood risk areas, where maps and management plans will be required. PFRAs for all LLFAs within PUSH were submitted to the Environment Agency for review and have been published.

River basin management plans (RBMP) –

- RBMPs constitute the central tool for confirming the objectives and actions required to achieve the objectives of the Water Framework Directive. The plans state the environmental objectives for the river basin district and explain the measures necessary to achieve good ecological status or potential where this is technically or environmentally feasible.
- In the PUSH area the River Basin Management Plan is the South East RBMP.

Flood Risk Management Plans

Flood Risk Management Plans cover flooding from main rivers, the sea, reservoirs and local flood risk management in flood risk areas. They look at the risks of flooding and how these risks can be managed. The Environment Agency must produce flood risk management plans (FRMPs) for each River Basin District. These FRMPs must cover flooding from main rivers, the sea and reservoirs.

By law Lead Local Flood Authorities (LLFAs) must produce FRMPs for all Flood Risk Areas covering flooding from local sources (surface water, ordinary watercourses and groundwater). LLFAs may either do a separate FRMP or contribute to a joint partnership FRMP for the River Basin District. Flood Risk Areas were identified through the Preliminary Flood Risk Assessments where the risk from local flood risks is significant.

The plans use information from existing plans and strategies such as shoreline management plans, catchment flood management plans and local

management strategies. They should also be coordinated with the River Basin Management Plans.

This approach co-ordinates flood risk management planning with river basin management planning under the Water Framework Directive, in particular the statutory consultation on proposed updates of River Basin Management Plans (RBMPs) and draft FRMPs.

Flood Risk Management Plans include:

- a map showing the boundaries of the Flood Risk Area
- the conclusions drawn from the flood hazard and risk maps
- objectives for the purpose of managing the flood risk
- proposed measures for achieving those objectives
- a description of the proposed timing and manner of implementing the measures including details of who is responsible for implementation
- a description of the way implementation of the measures will be monitored
- a report of the consultation

Local Flood Risk Management Strategies

The Flood and Water Management Act (FWMA) also requires a Lead Local Flood Authority (LLFA) to develop, maintain, apply and monitor a strategy for local flood risk management in its area.

Within the PUSH region the role of LLFA is held by:

- Isle of Wight Council, Portsmouth City Council and Southampton City Council
- and Hampshire County Council (excluding the above as unitary authorities).

In the PUSH region Lead local flood authorities (LLFAs) have each developed these local flood risk management strategies for their areas. Local flood risk

includes surface runoff, groundwater and lake, pond or other area of water which flows into an ordinary watercourse.

The National FCERM strategy sets the context for, and informs the production of local flood risk management strategies by LLFAs, which will in turn provide the framework to deliver local improvements needed to help communities manage local flood risk.

It also aims to encourage more effective risk management by enabling people, communities, business and the public sector to work together to:

- confirm the flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area,
- the objectives for managing local flood risk (including any objectives included in the authority's flood risk management plan prepared in accordance with the Flood Risk Regulations 2009),
- the measures proposed to achieve those objectives,
- how and when the measures are expected to be implemented,
- the costs and benefits of those measures, and how they are funded,
- the assessment of local flood risk for the purpose of the strategy,
- how and when the strategy is to be reviewed, and
- how the strategy contributes to the achievement of wider environmental objectives.

The LFRMSs also have links to some of the following plans and strategies relating to flood and coastal risk management, the planning context within which flood and coastal risks are managed and more detailed information.

Catchment flood management plans (CFMPs) –

The Environment Agency has produced catchment flood management plans (CFMPs), covering the whole of England. These plans or strategies for inland flooding provide high-level plans that set out objectives for flood risk

management across each river catchment and estuary. More specifically these plans:

- describe the flood risks over the catchments of large rivers
- set out policies on how these will be managed

Within the PUSH region the relevant CFMP catchments include:

- Isle of Wight, New Forest, Test and Itchen and South East Hampshire

Further information on the above CFMPs may be sourced from the .gov.uk webpages from the following hyperlink

https://www.gov.uk/government/collections/catchment-flood-management-plans#south-east-river-basin-district

CFMPs identify broad flood risk management policies that are economically practical, have a potential life of 50 to 100 years, and will help the Environment Agency work with others to put them in place but only set policy approach and do not have a source of funding associated with them.

The following policies for the approach to flood risk management are consistent across all CFMPs as follows:

Policy 1 – No active intervention (including Flood Warning and Maintenance). Continue to monitor and advise.

Policy 2 – Reduce existing flood risk management actions (accepting that flood risk will increase over time)

Policy 3 – Continue with existing or alternative actions to management flood risk at current level.

Policy 4 – Take further action to sustain the current level of flood risk into the future (responding to the potential increases in risk from urban development, land use change and climate change).

Policy 5 – Take further action to reduce flood risk.

Policy 6 – Take action with others to store water or manage runoff in locations that provide overall flood risk reduction or environmental benefits, locally or elsewhere in the catchment.

The CFMPs consider all sources of inland flood risk but not flooding from the sea apart from tide locking effects at inter-tidal areas of estuaries.

Shoreline management plans (SMP) –

SMPs and their associated action plans set the strategic direction of how coastal flood and erosion risk is managed within a coastal region. These plans identify a sustainable approach to work to further explore and define exactly what this is and how it can be done.

Shoreline management plans are developed by Coastal Groups with members mainly from local councils and the Environment Agency. They identify the most sustainable approach to managing the flood and coastal erosion risks to the coastline in the:

- short-term (0 to 20 years); medium term (20 to 50 years); long term (50 to 100 years)

The PUSH region is covered in its entirety by two SMPs

- North Solent Shoreline Management Plan, 2010: New Forest District Council
- Isle of Wight Shoreline Management Plan, 2010: Isle of Wight Council

More detailed Coastal Strategies or studies identify how these policies can be implemented through constructing, realigning or managing defence works.

Surface water management plans (SWMP) –

Lead local flood authorities are leading and co-ordinating the production of SWMPs for key locations that consider flood risk from surface water, groundwater and ordinary watercourses.

SWMPs provide a greater understanding of local flood risk in England and result in co-ordinated action plans agreed by all partners and supported by an understanding of the costs and benefits, which partners will use to work together to identify measures to reduce surface water flooding.

These plans establish long-term action plans to manage local flood risk and to influence future capital investment, drainage management, public involvement and understanding, land-use planning and emergency planning.

Within the PUSH area Hampshire County Council have prioritised plans for developing SWMPs and these are published and available on following webpages:

http://www3.hants.gov.uk/flooding/hampshireflooding/surfacewatermanagement.htm

The unitary authorities of Isle of Wight Council, Portsmouth City Council and Southampton City Council have also completed their SWMPs and have associated mapping published.

2.4 Local Planning Policy Signposting

The partner authorities within PUSH are at different stages of reviewing and republishing their Local Plan and Local Development Scheme Documents.

Updated high level guidance notes for each of the PUSH partner authorities are provided in Appendix B to assist the LPAs in allocating development in line with NPPF and in specifying relevant supporting information to support the requirements for and assessing the compliance of site specific FRAs.

Isle of Wight Council at the time of the original SFRA development were not part of the PUSH group of authorities. The council evolved an SFRA published in November 2007 which has since been updated. The Isle of Wight Council SFRA Mk II was undertaken by Entec and published in June 2010.

In respect of the Isle of Wight a new guidance note following the same format has been compiled where this authority was not included within the original 2007 PUSH SFRA package of work.

The content of the guidance documents for each LPA is defined by the nature and characteristics of flood risk present within each administrative boundary.

The guidance notes aim to promote the use of the SFRA and its deliverables by:

- Summarising the key findings of the SFRA, tailored for the specific flood risks found in each Local Planning Authority area.
- Relating planning policy (NPPF) to specific SFRA information and data.
- Providing guidance and signposting on the application of site-specific FRAs.

The following section includes links to landing pages for each of these client authorities. In addition to the area within the PUSH boundary local authorities have completed additional studies.

Table: Local Authority Planning Policy Plans and Supplementary SFRA hyperlinks

Authority	LDS Title	Hyperlink	Supplementary SFRA
Hampshire County Council	Hampshire Minerals and Waste Plan	http://www3.hants.gov.uk/mineralsandwaste/planning-policy-home.htm	Local Flood Risk Management Strategy as Lead Local Flood Authority (whole authority) http://www3.hants.gov.uk/flooding/floodriskstrategy.htm
Portsmouth City Council	The Portsmouth Plan	https://www.portsmouth.gov.uk/ext/development-and-planning/planning/local-plan.aspx	Local Flood Risk Management Strategy as Lead Local Flood Authority (whole authority) https://www.portsmouth.gov.uk/ext/community-and-environment/environment/flood-protection-policies.aspx
Southampton City Council	The City of Southampton Local Plan	http://www.southampton.gov.uk/planning/planning-policy/	Supplementary detailed assessment of sites to PUSH SFRA (whole authority) http://www.southampton.gov.uk/environmental-issues/flooding/development-flood-risk/level2-flood-risk-assessment.aspx Local Flood Risk Management Strategy as Lead Local Flood Authority (whole authority) http://www.southampton.gov.uk/environmental-issues/flooding/managing-flood-risk/local-flood-risk-strategy.aspx
Isle of Wight Council	Island Plan	http://www.iwight.com/Residents/Environment-Planning-and-Waste/Planning-Policy-new/	Not a member of PUSH in 2007 – SFRA delivered individually (whole authority) http://www.iwight.com/Residents/Environment-Planning-and-

			Waste/Planning-Policy-new/Island-Plan-Documents/Key-Background-Documents
Eastleigh Borough Council	Eastleigh Borough Local Plan	http://www.eastleigh.gov.uk/planning--building-control/planning-policy-implementation.aspx	N/A wholly within PUSH
East Hampshire District Council	East Hampshire District Local Plan	http://www.easthants.gov.uk/planning-policy/local-plan	PUSH SFRA covers area in PUSH following document is the remaining district area outside of PUSH boundary http://www.easthants.gov.uk/sites/default/files/documents/StrategicFloodRiskAssessment.pdf
Fareham Borough Council	Fareham Borough Local Plan	http://www.fareham.gov.uk/planning/local_plan/intro.aspx	N/A wholly within PUSH
Gosport Borough Council	Gosport Borough Local Plan	http://www.gosport.gov.uk/sections/your-council/council-services/planning-section/planning/	Supplementary detailed assessment of sites to PUSH SFRA (whole authority) http://www.gosport.gov.uk/sections/your-council/council-services/planning-section/local-development-framework/gosport-borough-local-plan-2029/gosport-borough-local-plan-2011-2029-publication-version-july-2014/evidence-studies/strategic-flood-risk-assessment/
Havant Borough Council	Havant Borough Local Plan	http://www.havant.gov.uk/planning-and-environment/planning-policy-design	N/A wholly within PUSH
New Forest District Council	New Forest District Local Plan	http://www.newforest.gov.uk/article/14155/Planning-Policy	PUSH SFRA covers area in PUSH following document is the remaining district area outside of PUSH boundary http://www.newforest.gov.uk/article/14770/Strategic-Flood-

			Risk-Assessment
Test Valley Borough Council	Test Valley Borough Local Plan	https://www.testvalley.gov.uk/resident/planningandbuildingcontrol/planningpolicy/	PUSH SFRA covers area in PUSH following document is the remaining district area outside of PUSH boundary https://www.testvalley.gov.uk/resident/planningandbuildingcontrol/planningpolicy/local-development-framework/evidence-base/evidencebaseenvironment/strategic-flood-risk-assessment/
Winchester City Council	Winchester District Development Framework (WDDF)	http://www.winchester.gov.uk/planning-policy/	PUSH SFRA covers area in PUSH following document is the remaining district area outside of PUSH boundary http://www.winchester.gov.uk/planning-policy/evidence-base/environment/strategic-flood-risk-assessment-2007/

2.5 Additional Relevant Plans and Policies

This section of the document is intended to remain live and update to the latest versions of additional plans and policies that have been developed by for the PUSH sub-region in relation to:

Minerals and Waste Policy

The majority of Minerals Planning Guidance (MPG) Notes and Minerals Policy Statements were cancelled with the publication of the NPPF. In addition the NPPF indicated that detailed waste policies now form part of the National Waste Management Plan.

To assist MPAs and WPAs in their strategic land use planning, SFRAs should present sufficient information to enable them to apply the sequential approach where possible to the allocation of sites. It is acknowledged within the NPPF that minerals have to be extracted and processed where the minerals are located but that the operational workings 'should not increase flood risk elsewhere and need to be designed, worked and restored accordingly'.

The National Flood Emergency Framework for England

Published in 2014,this Framework sets out the government's strategic approach to achieving the aims set out below and is intended for use by all those involved in planning for and responding to flooding from the sea, rivers, surface water, groundwater and reservoirs.

The plan's purpose is to provide a forward looking policy framework for flood emergency planning and response. It brings together information, guidance and key policies and is a resource for all involved in flood emergency planning at national, regional and local levels. It is a common and strategic reference point for flood planning and response for all tiers of government and for all responder organisations and bodies.

https://www.gov.uk/government/publications/the-national-flood-emergency-framework-for-england

3.0 SFRA Review

3.1 Scope of Review

The scope of this update and review was agreed with the project steering group that included membership from PUSH, local authority representatives, the Environment Agency and Lead Local Flood Authority representatives. A copy of the review scope is included within Appendix D.

As outlined in the introduction, a key objective of an SFRA update is to collect, collate and review all available information relating to flooding in the Study Area. The data and information is presented to enable end users to apply the NPPF Sequential Test at the required level to site of study.

3.2 Aims and Objectives

The specific objectives of the PUSH SFRA have been based on the aims of the Steering Group and identified through consultation with the LPAs and a review of the flood risk information available across the whole sub-region.

The long term objective for the PUSH SFRA review is to deliver a republication of the PUSH Strategic Flood Risk Assessment (SFRA) to bring the reporting and mapping datasets up to date with:

- the requirements of the National Planning Policy Framework (NPPF) and
- guidance in the National Planning Policy Guidance Notes (NPPGs) to support plan
- making and planning application decision making;
- latest evidence and information to underpin the review;
- confirmed ongoing hosting arrangements for web based outputs;
- inclusion of the Isle of Wight within the study area by signposting relevant evidence and information.

The aims and objectives or purpose of this SFRA update is to

- provide information on the changes to planning, policy and guidance since the previous SFRA;
- provide a detailed assessment of the flood hazard within the Flood Zones;

- provide information on existing defences and flood risk management measures where these exist;

- provide the evidence base to allow a sequential approach to site allocation to be undertaken within a flood zone; and

- support the development of partner authorities' policies and practices required to ensure that development in Flood Zones 2 and 3 satisfies the requirements of the Exception Test set out in the NPPF and NPPG.

This document firstly explains the context in terms of flood risks from all sources and contemporary advice from national planning policy in 2015. It is intended to be used as an assessment tool for the identification of sites allocated in the emerging Local Plans and Site Allocations Plans, where a Sequential and/or Exception Test are required.

The specific objectives of the original 2007 PUSH SFRA have also been reviewed and incorporated within this work where relevant.

3.3 Stages to Review

The sequence of tasks undertaken in this PUSH SFRA update was:

- Inception meeting with the key project stakeholders;
- Data request to key stakeholders;
- Collation and review of data;
- Identification of gaps in data or knowledge;
- Presentation of data review report to PUSH Planning and Infrastructure Panel;
- Mapping of available relevant information on flood sources and flood risk;
- Review of draft reporting and mapping by key project stakeholders;
- Publication of final outputs.

3.4 SFRA Analysis Checklist

In reviewing and updating the PUSH SFRA the project team undertook a screening and validation exercise to understand whether elements of the work remained fit for purpose and were in line with most recent legislation and guidance.

Importantly the analysis of the SFRA prioritised areas of the work that may affect the soundness particularly when being used as an evidence base to support local planning decisions and housing allocations.

The diagram below show a series of dashboard outputs undertaken during the initial screening and scoping phase of this project to assess necessary amendments required.

Figure: PUSH SFRA 2007 SWOT Analysis

4.0 Data Collection and Methodology

This section describes the data used to develop this updated SFRA.

The coastal water body of the Solent is a dominant feature of the PUSH region including the Isle of Wight and the estuaries and inlets of Southampton Water, River Hamble the three Harbours Portsmouth, Langstone and Chichester.

In addition to flood risks from tidal sources there are significant fluvial flooding risks from the Rivers Test, Itchen, Hamble, Meon, Wallington and Hermitage and Lavant Streams and their tributaries in addition to the River Medina and Eastern and Western Yar Rivers. A very large proportion of the local communities are situated adjacent to, or near, one of these rivers and/or its tributaries.

Significant flooding from groundwater sources has occurred in Hampshire since the original SFRA was published in 2007 most recently during the winter period of 2013/14 in which a substantial number of homes and businesses within PUSH were affected. This same period also provided significant occurrences of river and coastal flooding events that were not localised and caused internal flooding and damage to properties across the PUSH area.

This report (and the supporting GIS output maps) represents the reviewed and updated SFRA for the PUSH region. This document therefore supersedes the December 2007 report published by Atkins and has refreshed and updated the GIS maps hosted by Hampshire County Council. Supplementary to the original SFRA output package is the inclusion of the Isle of Wight and reference to SFRA work undertaken by that authority to support development of planning policy and site allocations plans.

This report represents the equivalent of a Level 1 SFRA. Where supplementary information has been deemed necessary to be produced on advice of the Environment Agency partner authorities may have supplemented this with the detail required for a Level 2 SFRA. If additional work has been undertaken this is identified within the supporting GIS mapping and will be searchable and signposted from the following mapset layer:

The flood risk knowledge within the PUSH region predominantly includes (but is not limited to):

- Flood Map for Planning (from rivers and the sea)for flooding from fluvial and tidal sources. This project has incorporated the latest available data, and will continue to be updated quarterly to the GIS mapping as updated by the EA;

- Previous plans and strategies relating to flood risk management activities;

- Experience of Risk Management Authority engineers and staff;;

- Historic records and information on past flood events from all sources (primarily coastal, river, surface water, groundwater and sewer);

An overview of the core datasets, including their source and their applicability to the SFRA process, is outlined here. It should be noted that information on flood risk is continually changing as flooding events occur and further modelling and analysis is undertaken. Therefore, whilst the datasets used are the best available at the time of publication, it forms a snapshot at the date of publication and the SFRA report should be reviewed periodically (see section 5.2).

4.1 Overview

The 2015 PUSH SFRA review was undertaken to ensure that commonality with the original 2007 outputs and therefore comprises three key deliverables:

- SFRA Report,
- SFRA Mapping Output Packages
- Guidance Notes for each LPA.

This document comprises the final SFRA report and includes the following:

- Interpretative summary of the outputs;
- Instructions on how to use and interpret the outputs;
- A review of the quality of the data used in the analyses;
- A review of the limitations and appropriate use of the outputs;
- Documentation of any refinements and amendments to the technical methods
- High level conclusions of the analyses

In order to organise and structure the outputs on the key objectives of the SFRA, mapping can be broadly split into two packages, each of which may be useful to all or some of the key LPA and Risk Management end users

The outputs from the SFRA will primarily be used by the following LPA and

Environment Agency staff:

- LPA Planners in allocating sites for new development and assessing strategies for redevelopment of existing sites in the flood zones to manage and/or reduce flood risk.
- LPA and EA staff in in assessing FRAs for development sites and assessing the risk to existing development in the flood zones. LPA and Environment Agency Flood Risk Managers in identifying key areas at risk to prioritise monitoring/maintenance/mitigation programmes, identify investment needs and assess sustainability of existing mitigation measures.

These outputs are also proposed to be used by:

- Emergency planners in identifying areas of high flood hazard and vulnerability, which can inform the development of emergency response and evacuation plans.
- Water companies in identifying constraints on and impacts of drainage infrastructure for new development.
- Developers and their agents in compiling site specific flood risk assessments

4.2 All Sources of Flooding

Information on modelled flood data and previous flooding incidents within the PUSH region has been collated from a variety of sources including:

- Previous PUSH SFRA (2007);
- Local Flood Risk Management Strategies (LLFAs)
- Preliminary Flood Risk Assessments (LLFAs);
- Risk Management Authority Records (EA, LLFA and Districts);
- Environment Agency records;
- Southern Water records.

Southern Water provided information on flooding resulting from surcharge and blockage of surface, combined and foul water sewers. This information has been re-used for this SFRA. This data, is subject to confidentially issues and specific incidences where individual properties were affected cannot be divulged. However, Southern Water is allowed to confirm how many properties have been subject to flooding per postcode area.

The previous SFRA was completed in December 2007. This SFRA updates and replaces that study with current information. Instances of historic recorded flooding have been used from that report augmented with the most recent data.

The Flood Map for Planning represents the most important dataset in applying the policies described in the NPPF, as they define which areas fall within each category in terms of the probability of flooding.

The latest version of the Environment Agency 'Flood Map' was used to provide the spatial extent of Flood Zones 1, 2 and 3 specified in the NPPF for the PUSH region.

The EA's Flood Map for Planning (Rivers and Sea), available on its website and may be requested from their Geostore webpages. The Flood Map shows a 'bare earth model' of the natural floodplain not accounting for the presence or effects of flood defences.

The Flood Map shows the area that is susceptible to a 1% (1 in 100) annual chance of flooding from rivers in any one year for fluvial flooding and a 0.5% (1 in 200) annual chance of flooding from the sea in any one year. It also indicates the area that has a 0.1% (1 in 1000) annual chance of flooding in any given year for both rivers and the sea. This is also referred to more generally as the 'Extreme Flood Outline'.

The Flood Map outlines for the PUSH region are comprised from a combination of a national generalised computer model and available historic flood event outlines and localised mapping projects. The EA has an ongoing programme of improvement, and updates are made on a quarterly basis for which this project will receive updates and seek to ensure that layers available on the PUSH SFRA webpages remain contemporary.

Due to the strategic nature of the study and the relatively large scale of the study area in which there are diverse sources of flood risk to consider, no hydrological or hydrodynamic modelling has been undertaken to attempt to improve, refine or update the existing Flood Zones held by the Environment Agency. This output package will be useful to planners and developers to ensure proposed developments are located appropriately within the Flood Zones. The map set will also be used by the Environment Agency to confirm that the Sequential Test has been satisfied.

Flood Zone 1 – Low Probability

Flood Zone 1 (FZ1) Low Probability comprises land assessed as having a less than 1 in 1,000 annual probability of river flooding (<0.1%). For SFRA purposes, this incorporates all land that is outside of the Zone 2 and Zone 3 flood risk areas. It is important to note that land within Flood Zone 1 may still be vulnerable to flooding from other, non-fluvial, sources.

Flood Zone 2 – Medium Probability

Flood Zone 2 (FZ2) Medium Probability comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%) in any year. In other words, land situated between Zones 1 and 3a.

Flood Zone 3a -High Probability

Flood Zone 3a High Probability comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) in any year.

Flood Zone 3b – Functional Floodplain

Flood Zone 3b (FZ3b) Functional Floodplain is defined in Table 1 of the NPPG as those areas in which "water *has* to flow *or be stored in times of flood"*. It is important to recognise that all areas within Zone 3b are subject to relatively frequent flooding – on average, 5% (1 in 20) annual chance. There are clear safety, sustainability and insurance implications associated with future development within these areas

For this SFRA review and update, the Environment Agency has provided data, where available from local modelling studies, in order to inform the designation of fluvial Flood Zone 3b, defined in the NPPF as 'the functional floodplain'. This represents the area of fluvial Flood Zone 3 that is at highest probability of flooding and is therefore a key area that should be avoided when considering the location of new development.

The application of this data has facilitated the delineation of zones of 'high', 'medium' and 'low' hazard of coastal and fluvial flooding. This mapping has subsequently been used by the partner authorities to identify the areas of greatest hazard within the Flood Zones and to facilitate a sequential approach to development within flood risk areas where it is necessary and appropriate.

If development is required within an area identified within zone 3 or 2 of the Flood Map for Planning (from Rivers and the Sea) it should also be sequentially allocated within each Flood Zone to steer new development to areas with the lowest probability and/or hazard.

The Flood Map shows the areas at risk for a flood of a given probability without the presence of defences.

In order to allow development to be sequentially allocated within each flood zone, a measure of the variable flood hazard within the zone is required. The Flood Hazard output package provides an onion skin effect of Flood Zones 2 and 3 in terms of the hazard posed by flooding within the zones, without consideration of the mitigating effect of existing flood defences.

The hazard index provided in this map set is a function of the velocity and depth of flood water, and has been estimated using appropriate assumptions and methods identified in best practice guidance, in particular the Defra/Environment Agency Flood and Coastal Defence R&D Document: Flood Risk to People (FD2321). The index within each Flood Zone is estimated based on the flood conditions define that Flood Zone, i.e.

- Within Flood Zone 3 the index is based on the potential flood depths that could occur during a 1 in 100/200 year event.
- Within Flood Zone 2 the index is based on the potential flood depths that could occur during a 1 in 1,000 year event.

For both Flood Zones 2 and 3 the index has been estimated using appropriate assumptions about potential flood velocity based on the distance from the source of the flooding, i.e. the river bank or coastline.

The Undefended Flood Hazard index as displayed on Map Set 1B is defined below in Table.

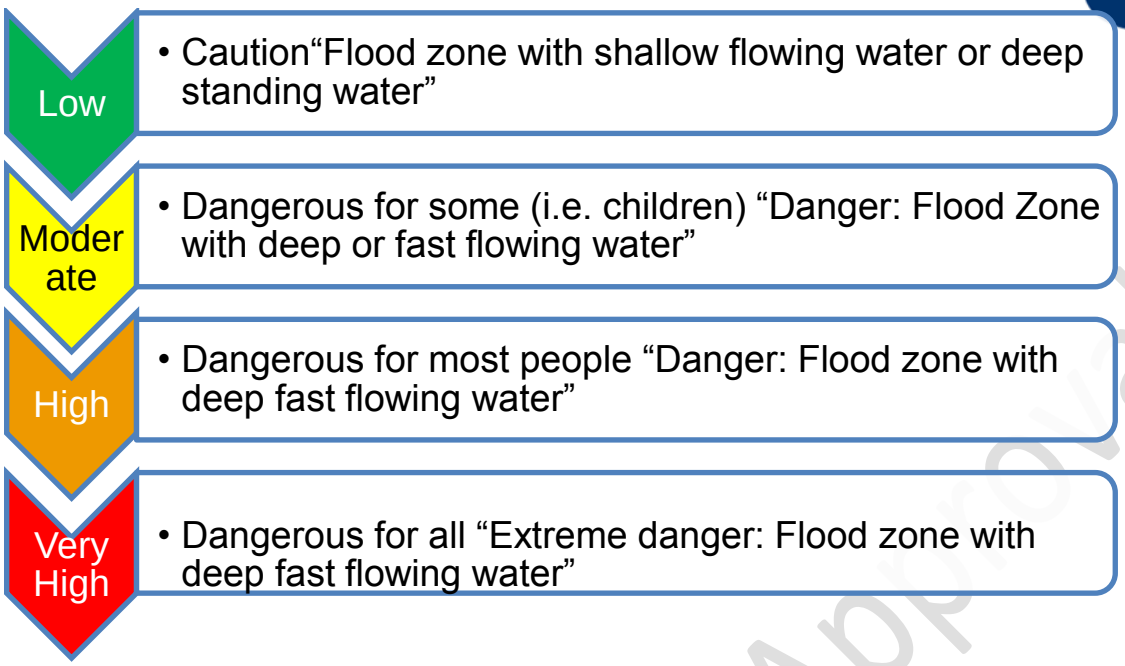

Figure : Definition of Undefended Flood Hazard Index

This output package can be used to facilitate the sequential approach within Flood Zones 2 and 3 (where it has been proven necessary by application of the Sequential and Exception Tests). It provides an extra level of detail in addition to the Flood Zones themselves, quickly allowing identification of those areas where a flood of equal probability may have vastly different consequences for those affected depending on their location. It is only represented in order to allow a high-level assessment of the flood risk to sites within the same Flood Zone relative to one another.

The undefended flood hazard information has been derived at an appropriate level of detail to allow LPAs to allocate sites for development. The hazard data has not, however, been calculated using modelling or other detailed numerical methods and is therefore not appropriate for identifying design parameters as part of site specific FRAs.

It should also be noted that this dataset reuses the information that was presented as part of the PUSH SFRA 2007 work package. Where updates have occurred to the flood zones there may be a discrepancy between those areas identified on the hazard map and flood zone 3. In this instance it is recommended that the used contacts the Environment Agency or local authority planning team to understand the site specific recommended course of action.

It is recommended that FRAs for sites located within the flood hazard zones should still undertake detailed topographic survey and undertake a

quantitative assessment of flood hazard based on more detailed assessments of defence standards, defence failure scenarios and overland conveyance of flood flows.

As this output package is an 'undefended' index, it is provided for both fluvial and tidal flooding. Full details of the technical method used to develop this technical output are provided in Appendix C

Indicative Areas Benefiting from Defences

Areas Benefiting from Defences (ABDs) are an important concept in flood risk management. They are formally defined by the Environment Agency and are an important component of the Flood Map for Planning (from Rivers and the Sea). When relating to the NPPF and Practice Guidance and the Flood Map, ABDs relate directly to only one of the Flood Zones, Flood Zone 3.

An area is defined as an ABD if the defences in place provide protection from the flood event that defines Flood Zone 3. In reality, many defences offer some degree of protection but are unlikely to prevent all flooding shown in Flood Zone 3. As such, Environment Agency guidelines state that ABDs must be created using hydraulic models of river and coastal systems and be generated using the flood outlines from defended and undefended versions of the same model.

ABDs are being delivered in the PUSH region by the Environment Agency's ongoing Strategic Flood Risk Mapping programme. Currently, as in many other regions of the UK, there are no finalised ABDs available to feed into the PUSH SFRA. The delivery of ABDs is an ongoing process for the Environment Agency and data for the PUSH region may become available in the future. Such data could then be incorporated into the PUSH SFRA during future updates.

In the absence of this data, however, the PUSH SFRA has attempted to define what are termed 'Indicative Areas Benefiting from Defences' along coastal frontages by comparing the 1 in 200 year extreme sea level with defence level data to identify areas that may be defended against this event. This is a high level assessment which is not completed in the same manner as the ABDs delivered by the Environment Agency.

Therefore, the Indicative ABDs represent areas that are currently shown to be within Flood Zone 3 but which are protected by defences that may prevent flooding of the areas during a 1 in 200 year surge tide. Only those areas where defences are consistently higher than the present-day 1 in 200 year

extreme sea level across an entire flooded frontage are considered as Indicative ABDs.

Coastal defences which have crest levels equal to or higher than the 1 in 200 year extreme sea level are indicated as purple lines. It should be noted that other areas may potentially be classified as ABDs if more detailed assessments of the defences, which is beyond the scope of this SFRA, are carried out. It is accepted that this high-level method does not take into account the benefit provided by all defences in the PUSH sub region. The following points are also important to note when reviewing this output package:

• There are no large scale flood defences on rivers that protect against the magnitude of event that defines fluvial Flood Zone 3, hence this output is only provided for tidal areas.

• The method for identifying Indicative ABDs is based solely on the crest level of the defences, generally obtained from survey data and therefore assumed to represent the as constructed top level of the defence structure. The assessment does not take into account defence type and any freeboard allowance that has been made in the design of the defences, as this data was not available consistently across the sub-region.

• An area can only be classed as an 'Indicative ABD' if the whole length of the defence frontage that surrounds an area of the flood zone is equal to or above the 1 in 200 year (0.5%) extreme sea level. Due to the strategic nature of this assessment, if small lengths of defences fall below that level, the area behind the defence cannot be classed as an 'Indicative ABD', even if in reality it is likely that the defences provide some degree of protection. A key example of this is along the Southsea frontage of Portsmouth, where small lengths of the defences which are below a 1 in 200 year level, prevent the area behind the defences being classified as an 'Indicative ABD'. In future once coastal defence improvements have been wholly implemented for this section of coastline, it will be identified as an Indicative ABD area.

• The assessment does not take into account the wave overtopping risk, where the defence crest level may be higher than the predicted extreme sea level but a risk of wave overtopping of the defences remains during a storm surge.

• This Map Set indicates areas where existing defences may provide a level of protection such that the actual probability of flooding is lower than that suggested by the Flood Zones.

As the indicative ABD layers were developed as part of the original 2007 output packages, they are not presented for the Isle of Wight Council area.

Surface Water Management Plans

Surface Water Management Plans (SWMP) identify sustainable responses to manage local flooding and contain Action Plans that provide an evidence base for future decisions. HCC, IOWC, PCC and SCC are developing SWMPs for their areas under prioritised plans and are likely to include:

- Maps showing predicted flood depth and velocity in different flood event scenarios, including consideration of climate change;
- Development of a number of options to improve management of local flooding, both through changes to policy and practice, as well as location-specific actions including individual property protection, control of runoff close to source and design of urban environments to make space for water. An estimate of their cost is included.

The SWMP made a number of location-specific and policy related recommendations to improve management of local flooding in the PUSH region.

There is no mapped data that it has been possible to incorporate within this SFRA update.

Surface Water Flood Maps

Since the 2007 PUSH SFRA, the EA has produced the FMfSW which was further updated in December 2013 (uFMfSW). This provides refinements over the previously defined areas published in the 2007 PUSH SFRA. The uFMfSW outline of a 1% (1 in 100) annual chance flood event is used in this SFRA as a basis of the surface water flood risk output package.

Based on the uFMfSW (2013), In areas susceptible to local flooding, the volume of runoff and sufficiency of the drainage, ordinary watercourse and sewer systems are critical to determining the degree of flood risk.

EA has the ability to locally designate Critical Drainage Areas (CDA) to cover such areas, but as is the case across much of the country, has not currently done so within the PUSH region.

Reservoir Dam Breach

Following a recommendation in the Pitt Review, the EA has made available Reservoir Flood Maps for those reservoirs that it regulates under the Reservoirs Act 1975.

These show the likely extent of flooding resulting from a dam breach which could be caused by extreme rainfall or floods, as well as structural failure. As this data was not included in the original PUSH SFRA, a review has been undertaken of the information available on the EA's website to assess the potential area of risk of a reservoir embankment breach.

Within the PUSH area there are limited areas that are mapped as being potentially affected by a reservoir dam breach.

Preliminary Flood Risk Assessment

A PFRA was required to be completed by December 2011 under the European Floods Directive by each LLFA (including LBH), implemented in the UK as the Flood Risk Regulations 2009. It is a high level screening exercise that identifies areas of significant flood risk from all sources, and summarises the probability and harmful consequences of past (historical) and future (potential) flooding.

Data utilised from this study for the present SFRA includes recorded instances of Surface Water flooding and areas identified to be at increased risk of groundwater flooding.

4.3 Consideration of Climate Change

There is clear scientific evidence that global climate change is happening now and cannot be ignored. Changes in the extent of inundation due to climate change are likely to be negligible in well-defined valleys, but could be dramatic in very flat areas particularly around the coast.

Evidence regarding predicted sea level rise and the availability of modelling to propagate these water levels over topographic data means that modelling of still water tidal inundation is relatively simple. Within the sub-region the mapping of this tidal climate change scenarios are well developed.

Where data does not exist in respect of climate change outlines, the following data and assumptions have been made to estimate the extent of the flood zones as a result of climate change to the year 2115:

- FZ2 will broadly become the extent of the current FZ3a

Analysis of ground levels should be made for those sites close to but outwith the boundary of Flood Zone 2 in order to determine whether a site currently in FZ1 (<0.1% AEP flood) should be considered as lying within FZ2 (the 0.1% AEP flood) at the end of this century.

It is not possible to extrapolate these assessments of climate change impact to estimate the potential changes to Zone 2. Detailed modelling has not been undertaken to estimate the impact of climate change on such an extreme event.

However, given the statistical rarity of a 0.1% (1 in 1000) annual probability event it is likely that the increase in extent due to climate change will be relatively small as the likely increase in river flows and sea levels is smaller as a portion of the total. In the same way the extent of the extreme flood outline accounting for climate change in tidal scenarios is assumed to be negligible.

4.4 Flood Risk Management Assets

The EA's Flood Map for Planning (Rivers and Sea) does not take account of the presence of raised defences. The NPPF states that defended areas are still at risk of flooding and therefore the adequacy of these defences must be considered when considering the development of a site in these areas. This will be included when a site specific flood risk assessment is undertaken to inform detailed design.

In the complex rural and built environments in which we live, many natural and manmade structures and features can affect the routing of flood waters. Some of these may have been specifically constructed (i.e. known as 'formal') for the purposes of managing water flow and reducing flooding (e.g. flood embankments, culverts and sluices) and are maintained by their respective owner. This could be the EA, Local Authority, or an individual. Others may have been built for a different purpose (i.e. known as 'informal') but which also affect the spread of floods (e.g. buildings, garden walls, railway embankments) but are not maintained for this specific purpose. The structures and features have not necessarily been used in modelling used to generate the flood maps used in this SFRA. However, the location of these assets are mapped and described here since it is important to recognise their function and to ensure that their functionality is not impaired by any development.

The EA has no statutory responsibility to maintain Main Rivers (and/or flood management assets) within the UK. This remains the responsibility of the riparian land owner. The EA retains 'permissive powers' however, and using these powers may carry out a programme of monitoring and maintenance.

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Fluvial Defences

Based on the information provided by the EA the majority of fluvial flood defences within PUSH are classified as natural channel and therefore operate as a function of high ground. Assets or control gates identified on the EA asset register are generally used to manage water levels within the PUSH area. The ownership of these structures varies but includes, private landowners, the EA, Southern Water and Local Authorities.

Coastal defence assets for the purpose of reducing risks from tidal flooding and coastal erosion are primarily constructed using the permissive powers of either the Environment Agency or the coastal maritime authority responsible.

The asset inventory of these assets is either held within an asset database maintained by the Environment Agency or the authority maintaining those assets. In respect of the Environment Agency's assets, the detail regarding these is held on a system referred to as AIMS (Asset Information Management System).

It displays detailed asset information on top of Ordnance Survey maps, and also presents other key information such as Floodmap, Authority boundaries and the river network. All organisations using AIMS will be able to see other user's information and develop a mutual understanding of risks and responsibilities.

The information contained within AIMS is used in a variety of ways including:

- Planning maintenance and investment;
- Managing an inspection programme;
- Building and updating flood maps and models, and
- Managing incidents.

In respect of the data held by maritime local authorities, there is no consistent system for holding this data and it is down to each authority to maintain and update their own asset register. Another important asset owner within the PUSH area are private landowners. It is unlikely that the asset owner will hold data regarding that asset unless there has been historic issues in the past. It is also not possible for local authorities to display details in respect of ownership and therefore in classifying these assets they are referred to as being 'private'.

As the asset layers were developed as part of the original 2007 output packages, they are not presented for the Isle of Wight Council area.

Flood Storage Areas

There are no flood storage areas within the PUSH region designated under the Reservoirs Act 1975.

4.5 Mapping Outputs

The SFRA review has collated and analysed both the historic data from the original 2007 PUSH SFRA outputs in addition to more recently published flood risk information for the PUSH sub-region. These have been delivered in two distinct groups or work packages each of which are designed to be used by all or some of the key LPA and Environment Agency end users.

To retain a common language from the original SFRA these have been termed Output Packages and continue to be hosted on web-based GIS mapping system at the following web address:

http://maps.hants.gov.uk/push/

The website is publicly accessible and not security protected. From the landing page there is a terms and conditions acceptance page in order for users to proceed to the full mapping pages. These terms have been reviewed and updated to include most recent contacts and liability statements.

The following maps accompany this SFRA update and have replaced the GIS mapping layers on the PUSH SFRA webpages:

- general basemapping for the PUSH region including the local authority boundaries and;
- flood map for planning (from rivers and the sea) including flood zones 2 and 3 in addition to main river centrelines. The map provides an initial indication of the probability of flooding to site and information to be able to apply Flood Risk Standing Advice;
- summary of historic flooding locations, including fluvial flood extents and local incidents of flooding recorded by the EA. It also includes instances of flooding recorded by LA and LLFA partners;
- indicative mapping demonstrating the likely impact of climate change on the extent of flood zones 2 and 3 in coastal locations. In relation to river flooding it has not been possible to derive hydraulic models which would compile climate change flood maps, this dataset is also not available for the Isle of Wight authority area within the GIS mapping but has been assessed as part of the IOWC SFRA work;;

- indicative mapping identifying the location of flood defences within PUSH region and their estimated strategic Annual Exceedance Probability (AEP). This mapping also includes an indicative layer demonstrating the likely Areas Benefitting from Defences (ABDs), where a scheme has been recently put in place where otherwise these areas subject to tidal/coastal flood risk event would flood under a 0.5% (1 in 200) annual chance tidal flood event without the defences;

  indicative hazard mapping of the areas at risk of fluvial and tidal flooding including an assessment of the flood hazard due to a breach (a combination of flood depth and flow velocity) – it should be noted that this mapset was originally developed as part of the original 2007 output packages and are not therefore presented for the Isle of Wight Council area. Care should be taken in using these maps in area where there has since been an update to the Flood Map where there may be a discrepancy of the furthest flood extents. For example in Eastleigh some areas of the flood plain have been since re-classified as Flood Zone 1 but will still remain as being within the indicative flood hazard mapping dataset.

- areas at risk of flooding from surface water. This is based on the uFMfSW produced by the EA in November 2013.

- indicative areas where properties have previously experienced sewer flooding, by post code based on records provided by Southern Water;

- Indicative mapping to assess the risk of groundwater flooding. This information has been obtained from BGS and the Environment Agency. This predominantly assesses groundwater flood risks based on the local geology.

- mapsets including the EA's Flood Warning and Alert areas within the PUSH region;

  It is understood that in some circumstances that it may be necessary for partners to seek superseded data that comprised the original PUSH SFRA output packages. The reporting and GIS layers that were produced have been archived but may be requested through contact details provided on the PUSH SFRA webpages.

4.6 Authority Guidance Documents

Appendix C to this report contains individual Guidance Documents for each of the LPA which have been developed to assist local authority planners and the Environment Agency when allocating future development sites in line with the NPPF and when specifying the requirements for and assessing the compliance of site specific FRAs. The content of the Guidance Documents for each LPA is bespoke to the types of flood risks present within each administrative boundary.

The Guidance Documents aim to promote the use of the SFRA and its deliverables by:

- Summarising the key findings of the SFRA, tailored for the specific flood risks
- found in each Local Planning Authority area.
- Relating planning policy (NPPF and Practice Guide) to specific SFRA information and data.
- Providing guidance on the requirements of site-specific FRAs.

5.0 Recommendations and Actions

The following recommendations are made with respect to the use of the SFRA outputs and improving and maintaining the knowledge base:

- The SFRA has assessed flood risk across the sub-region at a strategic level. The outputs and findings of the SFRA are therefore sufficiently detailed to inform strategic decision making in relation to spatial planning. The outputs and findings of the SFRA should therefore not preclude the need for detailed site specific flood risk assessments to accompany planning applications for proposed developments.
- It is recommended that the Environment Agency and LPAs give due consideration to the implications of climate change for flood risk across the sub-region;
- There are no consistent estimates across the sub-region for how climate change may increase the areas at risk of fluvial flooding. The SFRA has assumed that by 2025, increases in flows in the river will mean that Flood Zone 3 will extend to cover the area defined by Flood Zone 2. Again, this is a conservative approach that should be updated in the future when more detailed information becomes available.
- The SFRA outputs should be used to assess the sustainability of raising existing defences to contend with rising sea levels in a number of areas, particularly where the residual risks of flooding may remain unacceptably high.
- The SFRA outputs should be used to inform a review of existing defence standards and to assist in identifying potentially higher standards that may be more appropriate in light of climate change forecasts. However, the SFRA outputs alone cannot inform such an assessment, as it should include consideration of wider social and economic factors.
- The flood hazard data produced for the SFRA have been incorporated from the 2007 SFRA outputs and were generated using technical methods appropriate to a strategic level study. This data may be suitable for assessing flood risk at the site specific scale for sites with a low risk of flooding; however this should be agreed in consultation with the Environment Agency. The data may not be sufficiently accurate or detailed for site specific assessments in higher risk areas where techniques such as hydrodynamic modelling may be required to refine the understanding of flood risk.

- The assessment of indicative defence standards is based on a simple comparison of defence crest level against extreme sea levels. Site specific or more detailed assessments that are required to consider the function of defences should obtain and consider further data on defence type, condition, residual life and appropriate failure scenarios, in consultation with the Environment Agency.
- Where gaps in coastal defence asset information have been identified, local ground levels have been used to represent the crest level of the defence. Improvements to the defence database should be made to standardise the data entries and categories and to make the information consistent across the sub-region.
- Modelling information to define the fluvial functional floodplain (Flood Zone 3b) is currently only available for the Wallington Stream and the Tadburn Lake Stream. For the remainder of the main rivers, the SFRA has assumed that the functional floodplain is the whole of the high probability flood area (Flood Zone 3). This is a conservative approach that should be updated in the future when modelling information becomes available.
- The SFRA has highlighted the range and extent of information held by the LPA, the Environment Agency and the Water Companies. It recommended that a partnering approach between these Stakeholders should be adopted for the future development and improvement of flood risk and flood defence asset information. Furthermore, a partnering approach to strategic flood risk management can help to ensure that sustainable development is delivered across the sub-region.

5.1 Action Plan

This following section describes the next steps and action plan required to be implemented in order to keep the PUSH SFRA up to date and fit for purpose. Primarily this will assess whether there have been any changes to legislation or policy in respect of local flood risk information.

It is proposed that a monitoring and review process is put in place with a default regularity of annual assessments. At this point the project steering group will reconvene and recommendations for further stages of work and an assessment of their suitability will be put the project board for decision before further actions are taken.

Any changes proposed will be assessed according to criteria which will include criticality, urgency and cost effectiveness.

5.2 Future Monitoring and Update

The PUSH SFRA has been reviewed and subsequently revised, in accordance with the NPPF and most contemporary associated Technical Guidance. As part of this review process, the SFRA has been developed building heavily upon the best available knowledge with respect to flood risk within the PUSH region the time of publication (June 2015).

The Environment Agency undertake a quarterly review and update of the Flood Zone Maps and an continuing programme of flood risk mapping improvements within the Solent and South Downs area and more widely, South East region is underway.

It is expected that as mapping and modelling projects deliver that knowledge of flood risk within PUSH will be delivered. In some circumstance this may alter the predicted flood extents and outlines for any area which could have an impact on future development control decisions within these areas.

The revised PUSH SFRA is therefore adopted as a 'living' toolkit and will be reviewed periodically to assess the implications of revisions to legislation, delivery of local flood risk modelling outputs in addition to improved understanding of flood risks within the PUSH area particularly following significant flood events.

This SFRA has provided a snapshot of flood risk issues throughout the PUSH sub-region using flood risk, climate change and flood defence asset information available at the time of review in 2015. The datasets used in this assessment are likely to be updated, expanded or revised in the future. We therefore recommend that the SFRA is considered to be a live study that is reviewed and updated at appropriate intervals to account for new information, so that it can continue to provide a sound basis for future spatial planning decisions. Currently, there is no guidance on the appropriate frequency of updates to SFRAs. We would therefore recommend that updates are undertaken following significant revisions to key flood risk datasets and policy guidance or, as a minimum, every 3 to 5 years.

It is recommended that the project steering group is convened annually to assess the need for updates preferably following the winter period when coastal, fluvial and groundwater flood events are most likely to have occurred.

6.0 Summary

This document is the SFRA output report, which summarises the background and policy for the development of SFRAs, the guiding principles for undertaking a SFRA, the outputs of the SFRA and strategic flood risk management guidance for the LPA.

In addition to this report the work is supplemented by online mapping which visually represents flood risks across the sub-region and provides a tool to ensure appropriate development is located in relation to flood risks from all sources accounting for the predicted future implications of climate change.

Since the publication of the original SFRA package of work in 2007, monthly analytics of website use has been undertaken to profile the usage of the outputs including numbers of and locations of hits. This has shown that there is continued use of the website hosting the report and mapping.

PUSH is committed to ensuring that this evidence base remains fit for purpose for its end users and reviewing the SFRA on a regular basis in light of improved information relating to flood risks and/or a change in legislation.

The PUSH sub-region is exposed to flood risk from a number of sources.

Flooding from the sea, due to extreme tides, is the predominant source of flood risk to the sub-region's most populated areas on low lying coastlines in Portsmouth, Southampton, Isle of Wight, Gosport, Havant, Fareham, Eastleigh and the New Forest. In addition, the coastal frontages of Portsea, Hayling Island and Southern and Eastern coasts of the Isle of Wight have experienced flooding caused by wave overtopping;

A number of areas in Winchester, Test Valley and East Hampshire have been affected by groundwater flooding most notably during flood events of winter 2013/14.

All of the PUSH LPAs contain areas at risk of flooding from rivers and watercourses, with the Rivers Test, Itchen, Hamble, Meon, Wallington, Medina, Eastern and Western Yar Hermitage Stream and Lavant Stream passing through existing developed areas.

The sub-region is at reduced risk of flooding from the sea through defences along the majority of its coastal frontages. The level of protection afforded by the defences along each frontage varies considerably, with areas such as Portsea Island, parts of Gosport and Southampton, and Hayling Island generally defended to a higher level than other frontages in the sub-region.

There are no significant flood defences on rivers in the sub-region, although localised flood protection measures such as bank protection and maintenance of structures provide benefits in terms of flood risk in a number of locations.

Climate change poses a significant risk to the sub-region. Predicted sea-level rise over the coming century will reduce the level of protection provided by most of the sub-region's flood defences and result in the inundation of larger areas by extreme tidal floods. In addition, increasing severity of storm events is predicted to result in an increase in river flood flows, which will subsequently increase the risk of flooding from rivers.

In particular, the administrative areas of Portsmouth, Southampton and Gosport are significantly constrained by the extent of Flood Zones 2 and 3. Since the publication of the 2007 PUSH SFRA a greater understanding of flood risk in the sub-region has been fostered and significant expenditure is proposed in flood risk management infrastructure is proposed within these urban areas.

- The PUSH SFRA update has considered all sources of flooding, including fluvial, pluvial, groundwater, reservoir and sewer flooding, within the partner authority areas considered as being part of PUSH.
- The update has included signposting to SFRA work undertaken by the Isle of Wight Council that was not originally included within the original 2007 outputs as it was not part of the PUSH group of authorities at that time.
- An assessment of the flood defences in the PUSH SFRA area has been undertaken, including defence condition and standard and the residual risk.
- Guidance for the requirements for a site specific Flood Risk Assessment for partner local authority areas is provided in updated local authority specific guidance included within Appendix, as well as general guidance on flood risk assessment for any development proposals within the PUSH SFRA area.
- This review and update project has included latest GIS mapping for all mapped sources of flooding including the latest flood map for surface water, indicating the likelihood of surface water flooding SFRA area.
- Green Infrastructure within the joint SFRA area has been assessed and the Water Framework Directive status of the joint SFRA area's watercourses assessed.

7.0 References and Bibliography

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