Research on using flood risk information in spatial planning

Evidence report: developing good practice criteria

Date: November 2021

Version: FRS18204/R2

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Executive summary

Effective planning is essential for getting the right kind of sustainable growth in the right places. This includes avoiding development in flood risk areas and creating and maintaining places that are resilient to flooding. This report describes how flood risk information is used in strategic spatial plans and decision making, and the barriers and opportunities to improve this.

This study is documented in 2 reports:

- FRS18204/R1: Project report
- FRS18204/R2: Evidence report: developing good practice criteria

Background

Local development plans and policies are the main strategic tools used to locate new development in areas with the lowest risk of flooding. They are also beneficial in identifying and creating opportunities to reduce the impacts of flooding in existing communities.

In England, the National Planning Policy Framework (Department for Levelling Up, Housing and Communities (DLUHC), 2021) requires that strategic flood risk assessments (SFRAs) are carried out and their findings used to inform local development plans and policies. They are used to apply a sequential approach that steers development away from areas of flood risk, and to develop tests and protocols for safe and resilient building design. In Wales, LPAs are encouraged to undertake a strategic flood consequences assessment (SFCAs) to inform their local development plans and polices. Planning policy in England and Wales also requires that all sources of flood risk (river, sea, surface water, groundwater, sewers, and reservoirs) are considered as part of this process.

In 2018, the Environment Agency, Natural Resources Wales, the Welsh Government and the Department for Environment, Food & Rural Affairs (Defra) commissioned AECOM to research how flood risk information is currently applied in spatial planning, and to compile, analyse and share good practice and innovative approaches. The research focuses on SFRAs to identify the extent that current local development plans in England considered all sources of flooding.

Approach

To undertake this research the project team:

- Reviewed national flood risk planning policies in England and Wales and guidance on how to implement them
- Reviewed the recommendations made in the Defra research on strategic flood risk assessments (Defra, 2009) and commented on the progress
- Collated examples of instances where LPAs in England had successfully used flood risk information to achieve flood risk management outcomes. Reference was also made to good practice examples from Scotland.
- Considered criteria to help provide a consistent definition of what 'good practice' means in relation to the strategic assessment of flood risk and the sequential approach, and used this to identify good practice examples for detailed analysis
- Carried out interviews and a questionnaire to gather further evidence on the good practice examples, to learn from experiences, and to identify strengths and opportunities to improve current guidance and practice.

Main findings

The evidence gathered and the findings relevant to this study have been summarised in this report. Whilst the project scope included Wales, the limitations in gathering relevant evidence and subsequent review was largely limited to England. The main findings for England, at the time of writing (2019), are presented here and discussed throughout this report.

- The content and availability of SFRAs has improved since the last review in 2009, with virtually all LPAs in England now having produced one.
- Planning policy in England on applying the sequential test to steer development away from areas of high flood risk mainly uses information on flood risk from rivers and the sea, but not other sources of flooding as the policy requires.
- Planning policy and SFRA guidance in England does not provide comprehensive guidance on how to apply all aspects of flood risk planning policy. In response, a variety of locally-derived approaches have been developed or the policy element has been left unaddressed. (It should be noted that currently, there is no equivalent SFCA guidance for Wales).
- There was a high level of awareness of the SFRA guidance for England, however the depth of understanding about it varied from rudimentary to detailed. Flood risk practitioners tended to have a more detailed understanding than spatial planners.
- Interview results showed opinions of the current SFRA guidance were evenly divided and comprised a broad spectrum of views, from it being too complex and technical to it not being comprehensive or detailed enough. There was no consensus on the merits of creating separate versions for planning and flood risk practitioners.

- Spatial planners and flood risk practitioners were not able to identify exemplary SFRAs, nor had consensus regarding what constituted good practice. This was later developed by the project.
- Of the examples reviewed in this study, not one of them met all of the good practice criteria. All examples contained a mix of one or more elements that were judged as meeting the good practice criteria and remaining elements of average quality.
- Recommendations have been made to update existing guidance, develop capacity building and encourage sharing of good practice examples of how to meet flood risk planning policy requirements.
- Overall, the current quality of SFRAs was mixed regarding how comprehensively they addressed all planning policy requirements.

How the research will be used

This research will help develop materials to share good practice where flood risk management outcomes have been successfully achieved through the spatial planning system. The project outcomes are described in FRS18204/R1, including informing future updates to English national policy and guidance.

The research has since been used to create an SFRA good practice guide endorsed by CIWEM and ADEPT.

Introduction

Context in England

In England, the National Planning Policy Framework[1] (NPPF) (DLUHC, 2021) sets out the government's planning policies regarding flood risk management and how these should be applied. It provides a framework that allows locally-prepared plans for housing and other developments to be produced. It must be considered in preparing local development plans and is a material consideration in planning decisions.

The Planning Policy Statement 25 Practice Guide [2] (PPG) (DLUHC, 2018) advises how to take account of the policies within the NPPF, and address the risks associated with flooding in the planning process. The planning practice guidance on the natural environment also sets out how using environmental net gains and enhancements to ecosystem services can help to alleviate flood risk.

The NPPF requires that strategic flood risk assessments (SFRAs) are carried out in England and their findings used to inform local development plans and policies. SFRAs are used to apply a sequential approach that steers development away from areas of flood risk and to develop tests and protocols for safe and resilient building design.

LPAs use the findings of an SFRA to inform:

- local flood risk policies within local development plans, their associated sustainability appraisal and supplementary planning guidance
- strategic Infrastructure Delivery Plans and subsequent capital spending and mitigation funded through planning obligations
- individual development management decisions

The Environment Agency's guidance on how to prepare a strategic flood risk assessment (Environment Agency, 2019) explains what information LPAs in England need to include in an SFRA and how it should be used.

[1] National Planning Policy Framework - GOV.UK (www.gov.uk)

[2] Flood risk and coastal change - GOV.UK (www.gov.uk)

Context in Wales

In Wales, the Planning Act Wales (2015) sets out a sustainable development duty and makes links to the Environment (Wales) Act (2016) and the Well-being of Future Generations (Wales) Act (2015) to deliver the sustainable management of natural resources. The national development framework, "Future Wales National Plan 2020", sets the strategic direction for development in Wales and for addressing key national priorities through the planning system. In Wales, Planning Policy Wales (Edition 11, 2021) sets out the land use planning policies of the Welsh Government and is supplemented by a series of Technical Advice Notes. The main purpose of Planning Policy Wales is to make sure that the planning system contributes towards achieving sustainable development and improves the social, economic, environmental and cultural wellbeing of Wales. These are key pieces that will help support the future of flood risk management in Wales.

Technical Advice Note 15 (TAN 15) on development and flood risk (Welsh Government, 2004) provides technical advice that supplements the policy set out in Planning Policy Wales in relation to development and flooding. It provides policy and technical advice on development and flood risk as this relates to sustainability principles, and a framework within which risks arising from both river and sea flooding and from additional run-off from development in any location can be assessed.

TAN 15 advises LPAs in Wales to assess the risks and consequences of flooding using a Strategic Flood Consequence Assessment (SFCA). Local development plans, policies and site allocations should be informed by evidence where an assessment is undertaken to demonstrate if the flood risks and consequences can be managed down to an acceptable level.

There is currently no specific guidance published on how to prepare a SFCA. TAN15 is currently subject to review following public consultation. It is anticipated the revised policy document will be published alongside a new flood map for planning in 2021.

Research aim

In 2018, the Environment Agency, Natural Resources Wales, the Welsh Government and the Department for Environment, Food & Rural Affairs (Defra) commissioned AECOM to research how flood risk information is currently applied to meet the current planning policy.

The aim of this project is to explore how flood risk information is currently applied in strategic spatial planning in England, and to compile, analyse and share good practice and innovative approaches.

The research has a particular focus on strategic tools used in England, such as SFRAs and on identifying the extent that current local development plans considered all sources of flooding, including rivers (main rivers and smaller watercourses), sea, surface water, groundwater, sewer, and reservoirs, canals and other artificial sources of flooding (referred to as 'reservoirs' in this report). Where possible, it aimed to explore approaches that make resource savings.

This report describes the work to review the national planning policies and to compile and analyse the good practice.

Research objectives

This report describes work carried out to meet the following research objectives:

Review the national context for planning and flood risk

a. Review national policy, guidance and practice to understand current processes, skills/knowledge capacity, barriers and opportunities for improving development decisions regarding flood risk.

b. Provide recommendations on how current guidance documents could be improved in England and Wales.

Compile and analyse local good practice examples

c. Compile and analyse examples where flood risk information has been applied in spatial planning in England.

d. Establish a set of criteria to define what is considered 'good practice' in how flood risk information is applied in spatial planning.

e. Consult with Local Planning Authorities (LPAs) and Lead Local Flood Authorities (LLFAs) to understand the processes, skills/knowledge capacity, barriers and opportunities to apply the good practice criteria.

f. Identify potential ways to improve development decisions regarding flood risk.

Method

Overview

The project team consulted with interested groups with national roles and perspectives that could inform the research, as well as local practitioners such as LPAs and LLFAs.

Error! Reference source not found. summarises the different elements of work that have been carried out to establish the national perspective to inform objective 1.

Figure 0-1 Analysis to establish the national perspective for England

Approach to reviewing national guidance

The project reviewed PPG (DLUHC), SFRA guidance (Environment Agency) and flood risk standing advice (Environment Agency) (versions publicly available in 2018). The review was carried out on the published versions current in October 2018 and assessed the extent of available guidance and information sources on each individual flood source that could be applied in meeting the policy and procedural requirements set out in the online documents.

The review was used to provide recommendations to the Environment Agency on how each document could be improved for their consideration and further

discussion with the Department for Levelling Up, Housing and Communities regarding the PPG.

The project team carried out a second review in spring 2019 on unpublished draft revised versions of the PPG and SFRA guidance. The extent to which the initial 2018 recommendations had been incorporated was assessed and additional comments were provided.

The Welsh Government had carried out a separate review of TAN15 and therefore a detailed review of TAN15 has not been included as part of this research. No specific SFCA guidance has been published in Wales, although it is worth noting that the review of TAN15 identified a specific recommendation to inform further research on SFCAs.

The project team reviewed other national level (England) documents relating to spatial planning and development in areas at flood risk. The review included general and technical guidance (including those superseded but still used), research studies and relevant consultations. Those documents reviewed included:

- Guidance on sustainable drainage systems (SuDS) and flood resilience
- Defra's review of approaches to surface water flood risk management
- FD2320 'Flood risk assessment guidance for new development'

Relevant documents from Wales and Scotland, were also included in the review to help identify good practice and to establish a Great Britain-wide context that could then inform an assessment of the available guidance in England.

A total of 58 documents were collated. A summary of the organisations that own the documents is recorded in Table 0-1. Of these, 37 were guidance documents, 17 were research reports and 4 were interactive websites. A full list of the national level documents that were reviewed is included in Appendix A.

Two of the documents were the subject of a focused review: the Defra research project FD2610 'Assessing the quality and influence of SFRAs' (Defra 2009); and the Construction Industry Research and Information Association's research project RP1057 'Delivering better water management' (CIRIA 2019).

Table 0-1 Summary of national documents

Owner of document reviewed	Number of documents reviewed
DLUHC	**5**
Welsh Government	**10**
Scottish Government	**1**
Environment Agency	**9**
SEPA	**15**
NRW	**1**
Defra	**2**
CIRIA	**11**
Other	**4**
Total	**58**

Approach to focused reviews

FD2610 ‘Assessing the quality and influence of SFRAs

This project team reviewed recommendations made in a previous national review of SFRA content and implementation in England: FD2610 ‘Assessing the quality and influence of SFRAs’ (Defra 2009).

The purpose of the review was to determine whether the recommendations were still relevant and comment on the extent to which they have been implemented.

Where the recommendations were identified as outstanding and still relevant, the project team suggested further steps to help implement them.

CIRIA RP1057 ‘Delivering better water management’

The project team worked closely with CIRIA, who, during 2017 to 2019 carried out a research study RP1057 ‘Delivering better water management through the

planning system' (CIRIA 2019) to review overlaps and prevent duplication of research.

The CIRIA study produced guidance for local government, particularly LPAs and other planning groups to help them develop policies and provide high quality developments with better water management. Managing flood risk is an integral element of the integrated water management approach and the CIRIA study. The project team reviewed the CIRIA draft guidance and good practice case studies. Relevant findings were used to inform the research project.

Approach to interviewing national interested groups

The project team held interviews with organisations across England to gain their views on the content of the documents they owned or had written and how they are used within the planning and flood risk management sectors. The organisations were:

- Department for Levelling Up, Housing and Communities (at the time this was the Ministry of Housing, Communities & Local Government (MHCLG))
- Environment Agency
- Construction Industry Research and Information Association (CIRIA)
- Peter Bide (joint project lead on CIRIA's 'Delivering better water management' study and lead author of the PPS25 Practice Guide)
- Royal Town Planning Institute (RTPI)
- Town and Country Planning Association (TCPA)
- Chartered Institution of Water and Environmental Management (CIWEM)

Interviews were requested with Defra and the Institution of Civil Engineers (ICE) but they were not available. Multiple interviews were carried out with Environment Agency staff to explore aspects such as development and flood risk and the flood risk management skills within local authorities. The interviews were semi structured to capture responses to a range of set questions and to explore the interviewees' views on key matters.

Approach to defining 'good practice' criteria

The project team used consultation to establish a set of criteria that define 'good practice' in how flood risk information is applied in spatial planning in England by an LPA, LLFA or partnership of local authorities. The different elements of work that have been carried out to identify local good practice examples is summarised below.

1. Through consultation with the Environment Agency, NRW and SEPA, gather a long list of examples that stakeholders identify as good practice (without any specific criteria)
    - Examples identified by the Environment Agency, NRW, SEPA and AECOM
    - Examples identified from analysing the 58 national documents
    - Task informed by the national interested groups' interviews and knowledge from AECOM and its project team partners.
    - Examples categorised by geography, flood source, topic and format
    - Reasons analysed for why examples considered as good practice
2. Use analysis to develop good practice criteria
    - Criteria drawn up to define 'good practice' for the purpose of this research, developed from the requirements of the PPG, SFRA guidance and TAN15, supplemented by the good practice reasons for the long list examples
3. Using the long list of examples, identify where further examples needed to enhance evidence
    - Gap analysis carried out and consultation with the Environment Agency
    - Additional examples identified to fill gaps
    - Revised long list of potential good practice examples established
4. Create a short list of examples against the good practice criteria
    - Criteria applied to create the shortlist of confirmed good practice examples
    - Shortlist moderated to make sure a representative sample was selected within and across the categories of geography, flood source, topic and type of document/tool
5. Carry out further analysis on the short list. This was undertaken in two stages:
    - Tranche A: For 17 shortlisted examples selected, the document / website/tool was analysed and a deep-dive interview carried out with authors/owners. A gap analysis carried out to identify any under representation of examples for the good practice criteria
    - For Tranche B: An additional 14 examples were selected for analysis and deep-dive interviews with authors/owners

Approach to analysis of shortlisted examples

For each of the shortlisted good practice examples, a detailed analysis of the document(s) was carried out.

Details of the project example were recorded, such as title, date of preparation, lead contact, a description of the project example, its context, the size of the document or the type of tool and its structure. A description of the elements that are considered 'good practice' was then provided, with details of how they were considered to meet the relevant criteria.

These findings were recorded along with any questions for further discussion during the deep-dive interviews.

Approach to deep-dive interviews on shortlist examples

Deep-dive interviews were held with individuals from the relevant LPA and/or LLFA for 12 of the tranche A and 4 of the tranche B local good practice examples (these are identified later in Table 0-6 and Table 0-77). In some cases, the interviewees were the individuals involved in commissioning or producing the document. In other cases, the interviewees had worked with the document in the implementation phase. Interviewees for the remaining shortlisted examples were unavailable.

The interviews were semi-structured and responses were recorded in written notes. The following topics were covered during the deep-dive interviews:

- views on the national framework of policy and existing technical guidance
- experience with the good practice example and applying policy and technical guidance locally
- details of the successes, challenges, and lessons learnt
- the extent to which the SFRA led to local policies, wider flood risk strategies or activities
- how well the project example is understood and used by other departments in the LPA
- how the sequential test was applied, considering all flood sources
- opportunities to bring about reduction in flood risk, and achieve net gain
- the level of need and suggested format for a good practice evidence base

Five of the questions required the interviewee to provide a scored response from 1 to 5, so numerical metrics could be prepared.

The interviews completed for the tranche B project examples were carried out to provide a particular focus on the benefits of collaborative working and preparing SFRAs over a wider spatial scale. Additional questions were incorporated into these interviews to address:

- how they worked collaboratively to prepare the evidence base
- what their collaboration enabled with respect to wider flood risk management outcomes
- any impact on project costs
- how differing programme needs were managed

Potential local authority interviewees from Wales were approached, however they were not available to participate. The deep-dive interview exercise therefore comprised only participants from England, and the findings consequently relate only to views expressed on spatial planning and flood risk arrangements in England.

Findings

Overview

This section presents the findings from the analysis carried out on research objectives 1 and 2, as follows:

- Review of the PPG, Environment Agency SFRA guidance and flood risk standing advice versions current in 2018
- Review of the recommendations made in the 2009 SFRA review report (FD2610)
- Review of the CIRIA RP1057 ‘Delivering better water management’ study
- The good practice long and short lists
- General findings and recommendations from collating the long list, shortlisting, document analysis and deep-dive interviews
- Specific findings and recommendations relating to each of the good practice criteria

The review of TAN15 was not included in the scope of this research and there were no available participants from planning authorities in Wales for the deep-dive interviews. Therefore, the findings outlined below focus on spatial planning and flood risk arrangements in England.

Review of PPG, SFRA guidance and standing advice

The review of the documents (publicly available in 2018) highlighted a number of key issues that were common across the PPG, SFRA guidance and flood risk standing advice (referred to below as current guidance), particularly about where the content and links to supporting information sources could be improved. These findings and initial recommendations are presented below.

1. There is no available guidance on how flood risk from reservoirs and groundwater should be assessed in an SFRA and taken account of in a local development plan. Guidance should be produced to address this.
2. Current guidance on explaining how surface water flood risk should be assessed in an SFRA, for example the sequential test, and taken account of in a local plan is inadequate. Guidance should be revised to address this.
3. Current guidance on how LPAs should develop locally specific flood policy (not just reproduce what is included in the NPPF) is inadequate. Additional guidance should be produced to address this.
4. There is a current lack of data on surface water, groundwater and reservoir flood sources from Environment Agency flood maps for

planning. Current guidance on explaining what information on flood extent and flood depths should be considered for planning purposes is inadequate. Other data is available, for example the Environment Agency 'Risk of flooding from surface water and risk of flooding from reservoirs', groundwater susceptibility maps or maps produced by local authority flood models. However, there is no guidance on how these should be used for planning purposes. All references within the guidance documents to 'flood maps' should be reviewed to clarify what data on surface water, groundwater and reservoir information should be used and how to use it.

5. Current guidance on explaining how opportunities to reduce existing flood risk (net gain) should be considered is inadequate, in particular with relation to guidance on the exception test, which has an explicit requirement to reduce flood risk overall. Guidance should be produced to address this.
6. Review if and how the Environment Agency's normal requirement for freeboard should be taken into account in setting appropriate ground floor levels for properties.
7. Current guidance on what climate change allowances should be applied to surface water, groundwater and reservoir flood risk is inadequate. Guidance should be produced to address this, even if the position is 'no allowance is required/available'.
8. Current guidance does not clearly highlight that LPAs can incorporate flood risk into s106 and Community Infrastructure Levy policies for strategic solutions (as opposed to ad hoc piecemeal mitigation). Guidance should be revised to address this.
9. Current guidance does not clearly highlight that the PPS25 Practice Guide has been superseded by the PPG and SFRA guidance (as confirmed during the interview with DLUHC). Guidance should be revised to address this.

Recommendations based on the above points were provided to the Environment Agency's national Flood and Coastal Risk Management and Sustainable Places teams to consider during future revisions to the SFRA guidance and flood risk standing advice, and to inform their advice to DLUHC on future revisions to the PPG. These recommendations are presented later in this report.

Review of FD2610 'Assessing the quality and influence of SFRAs' study

The recommendations made in the research project FD2610 'Assessing the quality and influence of SFRAs' (Defra 2009), referred to in this report as the '2009 SFRA review', were reviewed to determine whether they have been implemented, superseded or remain outstanding as of December 2019.

The findings from this project are detailed in Appendix C: Review of recommendations in FD2610 study (2009). In summary, of the 6 core 2009 recommendations 3 are judged to have been adequately implemented (although further work would be beneficial for some of them), 2 partially implemented and 1 has had minimal implementation. Three of the 14 supplemental recommendations are judged to have been adequately implemented (although further work would be beneficial for some of them), 10 have been partially implemented and 1 has had minimal implementation.

Using this current research's outputs to promote good practice examples is a generic recommendation and therefore not comprehensively repeated in the recommendations.

Review of CIRIA RP1057 'Delivering better water management' study

This research into flood risk and spatial planning ran concurrently with CIRIA's 'Delivering better water management' study. The focus of the CIRIA study was to support effective planning for water by providing integrated water management (IWM). IWM is a collaborative approach to managing land and water that delivers coordinated management of water storage, supply, demand, wastewater, flood risk, water quality and the wider environment.

It reported that maintaining an adequate supply of water and drainage capacity especially during extreme rainfall events is getting much more difficult. It requires careful and integrated planning, with LPAs working closely with water companies, LLFAs, Internal Drainage Boards and other Flood Risk Management Authorities, and highways authorities.

The work looked at approaches for LPAs to avoid and mitigate the risks of water pollution, too little water, and too much water (flooding). The resulting guidance identifies 5 critical success factors to achieve good IWM. These critical success factors are:

- understanding IWM
- supportive local policy
- early engagement
- partnerships
- good management

The guidance provides case studies of how these critical success factors are applied in practice against a number of topics, including 'reduced risk of flooding'.

The guidance identifies 3 significant constraints to the process. These are:

1. LPAs may not have enough resources to prioritise this work over competing demands
2. National policy may not be coherent or specific enough to support the process, and may be open to interpretation by developers with different objectives to those of the LPA and the local community
3. A lack of appropriate statutory technical requirements. The guidance advises that these constraints can be overcome by applying the critical success factors to and through partnership working.

The CIRIA study was analysed to identify relevant findings and case studies related to how IWM contributes to reducing the risk of flooding from a range of sources, at different scales (landscape to property), and through various intervention measures (including natural flood management and sustainable drainage systems).

From the analysis of the CIRIA study and the case studies produced, its findings as outlined in the 5 critical success factors above, were broadly in common with the good practice criteria from this research. The number and prescriptive nature of the NPPF and PPG requirements mean that there are a larger number of critical success factors for SFRAs, which this research defines as good practice criteria.

IWM case studies such as Cambridge city, Brighton and Hove city, Arun district and Hull city illustrated the wider value that SFRAs can have in helping to make sustainable development decisions. For example:

- Cambridge City's SFRA provided evidence that there is no capacity in Cambridge's watercourses to cope with additional surface water run-off from new development. This helped create planning policy to make sure that all new developments used SuDS to manage surface water.
- Hull City's SFRA identified that much of the city is at combined risk of river, sea and surface water flooding and heavily reliant on flood defences. The SFRA helped the city council's ambition to make a positive net gain on the city's environment and water systems. It also helped create an effective partnership to progress common flood risk, water management and biodiversity goals between the city council, the Environment Agency and Yorkshire Water.

Good practice criteria and examples

Collating a long list of potential good practice examples

First, as described earlier in the approach, a long list of examples were identified to demonstrate what stakeholders considered good practice, and what would be considered good practice against national planning requirements and guidance.

Examples included projects that demonstrated good partnership working between organisations, projects with comprehensive assessment of flood risk or new modelling techniques, projects that had led to specific flood risk policies being developed, innovative ways of carrying out the England PPG's sequential test considering all sources of flooding, and those where the SFRA was considered to provide more than the minimum policy requirements.

The examples were recorded in a data register and categorised based on the type of document (for example, PDF document or website), geography, the flood source(s) assessed and type of tool. This helped to facilitate how the documents were then assessed and to make sure the examples covered a suitable breadth of all categories.

A total of 117 potential local good practice examples were identified. A breakdown of the examples within each category is included in Table 0-1 – 2-4. A full list is provided in Appendix B.

Table 0-1 Summary of local good practice examples by document type

Document type	Number of examples
SFRA/SFCA	26
Local plan and policy	38
Flood risk management	34
SuDS guidance	19
Total	**117**

Table 0-3 Summary of local good practice examples by location

Location	Number of examples
Scotland	8
Wales	11
Northern Ireland	2
North West England	4
North East England	10
East England	19
Midlands	7
South East England	46
South West England	10
Total	**117**

Table 0-4 Summary of local good practice examples by flood source

Flood sources	Number of examples
All sources	37
River	25
Sea	8
Surface water only	18
Groundwater only	1
Two or more sources	28
Total	**117**

Developing the good practice criteria

The long list was further analysed to identify and summarise the reasons for the local examples being proposed as potential good practice. In consultation with the national stakeholders the project team created consistent rationale for defining good practice.

The good practice criteria are based on a range of factors including:

- the requirements for an SFRA or sequential test as set out in the PPG
- the extent to which the SFRA or sequential test addressed all the policy requirements
- the way the tools have been used by LPA officers to implement flood risk policy or development management

The criteria are not intended to be exhaustive. It was also deemed unlikely to all be found within any one good practice example. However, they provide an indication of the variety of aspects of an example that may be considered ‘good practice’ against national planning policy and within the scope of this research.

The good practice criteria are presented in Table 0-5.

Table 0-5 Good practice criteria

Criteria	Definition of good practice (basic)	Definition of good practice (aspirational)	Requirement of the PPG
A Flood source	To assess surface water risk, includes SuDS provision.	To apply the sequential test specifically to surface water flood risk.	Yes
B Flood source	To assess groundwater risk.	To apply the sequential test specifically to groundwater flood risk	Yes
C Flood source	To assess risk from reservoirs and other artificial sources.	To apply the sequential test specifically to reservoir flood risk	Yes
D Flood source	Integrated or innovative way of assessing all sources of flood risk.	To apply the sequential test in an integrative way to all flood sources	Yes
E Cumulative risk	To assess cumulative risk, for example, how much flood storage has been lost historically; and identify development limits to protect flood plain capacity to store flood water. To develop specific policy, approach and requirements in urban infill and regeneration areas at risk of increasing flood risk due to cumulative development.	LPA decision makers and committees actively discuss the potential cumulative impacts for all sites within flood risk zones and to make use of strategic scale surface water data (e.g. SuDs opportunity maps to secure cumulative benefits over wider areas).	Yes
F Accounting for future changes in flood risk	To identify areas of land to be safeguarded for current and future FCERM use, for example, identify space for new or enlarged flood defences and future expansion of flood zones. To incorporate climate change allowances into land allocation decisions.	To prepare and implement a relocation policy, which can be used to identify locations that could be unsustainable in the future due to climate change and identify sites for relocating development outside of unsustainable areas.	Yes
G Comprehensive scoping	Other LPA teams, risk management authorities (RMAs) and interest groups to be consulted early to identify all known data, flood issues and opportunities that can be explored when		No

Criteria	Definition of good practice (basic)	Definition of good practice (aspirational)	Requirement of the PPG
	producing the SFRA, which will inform development planning decisions.		
H Wide spatial scale assessment	To assess flood risk at a river catchment or other flood catchment scale that is larger than a single LPA.	To demonstrate clear benefits (for managing flood risk), including efficiencies (for example, budget and time) from assessing flood risk at a spatial scale larger than a single LPA.	No
I Collaborative working	To take a collaborative and holistic approach between LPA and RMAs to define the scope of a SFRA so that it captures multiple opportunities to assess and address FCERM-related issues.	To adopt close working between LPA planning policy teams and development management teams to establish policy approach and ensure implementation through future development.	No
J Addressing specific local flooding characteristics	To implement an approach that takes account of, for example, rapid speed of onset (flashy river or surface water run-off), and barriers to drainage (community being in a bowl or below sea level).		No
K Emergency planning	To develop specific policies for establishing the need for a development to be made safe and how this can be achieved given the requirements of the exception test, including how to consider access and egress routes and how to implement a response procedure for occupants. A blanket approach cannot be applied as it will vary depending on flood risk and nature of development.	To ensure that emergency planners, emergency service providers and local resilience forums are involved in preparing the SFRAs to agree and deliver key outputs.	Yes
L Governance	To ensure that appropriate governance is in place to make sure that the SFRA/ findings are shared with, and used by, appropriate teams,		No

Criteria	Definition of good practice (basic)	Definition of good practice (aspirational)	Requirement of the PPG
	individuals or organisations in their plans, initiatives and policies.		
M Informing other plans and strategies	To ensure that SFRA informs strategy, allocations and development management policies from the outset. To ensure that the SFRA and its findings are integrated into parallel processes, such as housing and economic land availability assessments and sustainability appraisals.	To ensure the SFRA informs future infrastructure planning, for example, Green Infrastructure Plans, Community Infrastructure Levy, and Infrastructure Funding Statement.	Yes
N Net flood risk reduction	To explore opportunities through the development planning and management processes to reduce the causes and impacts of existing flood risk.	To adopt and deliver a specific policy, approach or requirements, which identify geographic areas that could be used to achieve environmental net gain, for example, areas that would benefit from SuDS, river restoration or other natural flood management methods.	Yes
O Windfall development	To sets out requirements for windfall sites with respect to sequential testing and improved flood risk management.	To set out requirements for windfall sites where there is a particular flood risk issue or an opportunity to improve the management of flood risk and consequences.	Yes
P Document format and accessibility	To allow easy access to information for a range of users, for example, interactive PDFs or online mapping available at several scales. To ensure that users are able to update flood risk information and maps easily.	To apply the information in the document (e.g. SFRA) to topics beyond its original remit if relevant to do so.	No

Shortlist of good practice examples

An initial shortlist of the local good practice examples was proposed, to focus the deep-dive interviews and further analysis.

The shortlist was first divided into 2 groups: tranche A, which focused on SFRAs; and tranche B, which included other types of documents or tools and collaborative working approaches (Table 0-6 and Table 0-77).

It was then moderated to represent the different regions (as identified in Table 2-3) and countries, sources of flooding and types of documents. Lastly, it was reviewed and finalised, making sure the detailed analysis focused on spatial planning tools and examples of collaborative working between LPAs when preparing local development plan evidence base documents.

Table 0-6 Shortlist of local good practice examples, tranche A

Example	Type	Location	Flood source	Deep-dive interview
Brighton and Hove Adopted Local Plan (Policy CP 11)	Local plan and policy	South East England	All sources	Y
Cambridgeshire Flood and Water Supplementary Planning Document (SPD)	SuDS guidance	East England	All sources	Y
Conwy SPD LDP27: Coastal Flood Risk Protocol	Local plan and policy	Wales	Sea	N
Hart SFRA addendum - sequential test document	SFRA	South East England	Fluvial, surface water and groundwater	Y
Hull Local Plan (Policies 37 to 41, 43-44)	Local plan and policy	North East England	All sources	Y
Joint West London SFRA	SFRA (interactive website)	South East England	All sources	Y
North Glasgow Integrated Water Management System (IWMS): A Review	Flood risk management	Scotland	Surface water	N

Example	Type	Location	Flood source	Deep-dive interview
North West Cambridge Area Action Plan (AAP)	Sustainable drainage systems (SuDS) guidance	East England	Surface water	Y
Partnership for Urban South Hampshire SFRA	SFRA (interactive website)	South East England	Fluvial, surface water and groundwater	Y
Shawfield SFRA and Surface Water Management Plan	SFRA	Scotland	All sources	N
South Downs National Park Authority Level 2 SFRA	SFRA	South East England	All sources	Y
South East England SuDS guidance	SuDS guidance	South East England	Surface water	N
South East Lincolnshire SFRA	SFRA	Midlands	Fluvial and sea	N
Southampton Level 2 SFRA	SFRA	South East England	Fluvial and sea	Y
Waverley Level 2 SFRA	SFRA	South East England	Fluvial and surface water	Y
Wiltshire Groundwater Management Strategy	Local plan and policy	South West England	Groundwater	Y
Worcestershire Minerals Local Plan	Flood risk management	Midlands	Fluvial	Y

Table 0-7 Shortlist of local good practice examples, tranche B

Example	Type	Location	Flood source	Deep-dive interview
Cornwall Level 1 SFRA	SFRA (interactive website)	South West England	Sea	N
Cornwall Local Plan Strategies Policies 2010 to 2030	Local plan and policy	South West England	Sea	N
Dover SFRA – Site-specific guidance for managing flood risk	SFRA	South East England	All sources	N
East Riding of Yorkshire Council Local Plan flood risk note for the planning application process	Local plan and policy	North East England	Fluvial	N
Gloucester City, Cheltenham and Tewkesbury Joint core strategy	SFRA	South West England	All sources	Y
Huntingdonshire SFRA and associated mapping	SFRA	East England	Fluvial and surface water	N
Leicestershire County and Leicester City SFRA	SFRA	Midlands	All sources	N
Norfolk Council SFRA	SFRA	East England	All sources	Y
Northamptonshire Flood Toolkit	Flood risk management (interactive website)	Midlands	All sources	N
Manchester, Salford and Trafford Level 2 Hybrid SFRA	SFRA	North West England	All sources	Y
Sheffield City core strategy	Local plan and policy	North East England	All sources	N

Example	Type	Location	Flood source	Deep-dive interview
Shoreham Harbour Flood Risk Management SPD	Local plan and policy	South East England	Surface water	N
Wandsworth Local Plan core strategy policies PL 2: Flood Risk & PL 9: River Thames and the riverside	Local plan and policy	South East England	Fluvial	N
Waveney Development and Coastal Change SPD	Local plan and policy	South East England	Sea	Y

Findings and recommendations on each good practice criteria

The following sections set out the good practice criteria that this research developed to provide a consistent framework of factors in both producing and using SFRAs. Example projects and documents are included in the tables from short list. The findings and recommendations developed through the analysis and interviews are described for each good practice criteria.

Criteria A-D: Incorporating surface water, groundwater and reservoir flood sources and an integrated assessment of all flood sources

Criteria description: A: Flood source – surface water

Good practice (basic): Assesses surface water risk; includes SuDS provision

Good practice (aspirational): Specifically applies the sequential test to surface water risk

Examples

- West London SFRA
- North Glasgow IWMS
- Waverley Level 2 SFRA
- South Downs SFRA
- Hart SFRA addendum
- Huntingdonshire SFRA online mapping
- East Riding of Yorkshire Flood Risk Note
- Gloucester, Cheltenham, Tewkesbury SFRA
- Brighton and Hove Adopted Local Plan

Criteria description: B: Flood source - groundwater

Good practice (basic): Assesses groundwater risk

Good practice (aspirational): Specifically applies the sequential test to groundwater risk

Examples

- Wiltshire Groundwater Management Strategy
- Waverley Level 2 SFRA
- Hart SFRA Addendum

Criteria description: C: Flood source: reservoirs and other artificial sources

Good practice (basic): Assesses risk from reservoirs and other artificial sources

Good practice (aspirational): Specifically applies the sequential test to risks from reservoirs and artificial sources

Examples

- Waverley Level 2 SFRA

- Hart SFRA addendum
- Manchester, Salford, Trafford Level 2 SFRA

Criteria description: D: Flood source: Integration

Good practice (basic): Integrated or innovative ways of assessing all sources of risk

Good practice (aspirational): Specifically applies the sequential test in an integrated way

Examples

- North Glasgow IWMS
- Waverley Level 2 SFRA
- South Downs SFRA
- Hart SFRA addendum
- Huntingdonshire SFRA online mapping
- East Riding of Yorkshire Flood Risk Note
- Gloucester, Cheltenham, Tewkesbury SFRA

Findings

- Interviews demonstrate that LPAs understand the role of the SFRA to inform the sequential test and exception test.
- Within the shortlist, the sequential test and exception test was widely applied using river and sea flood risk information.
- Within the shortlist, there are 9 examples where the sequential test has been applied to surface water and/or groundwater flood sources. Different approaches were used to rank the sites. However, adopting a sequential approach *within* the potential development sites was still considered the main method of managing surface water and groundwater flood risk rather than the sequential test, which resulted in excluding potential sites from accommodating new development.
- Within the shortlist, there are 3 examples of the sequential test being applied to reservoir flood risk and one to canals (Manchester-Salford-Trafford).
- Interviews found that further guidance is desired on how the sequential test and exception test should be applied to surface water, groundwater and reservoir flood sources. Some interviews also noted that a comparative approach between surface water and fluvial flood risk is hindered because there is no national definition of Flood Zone 3b.

What's needed to mainstream good practice?

Additional guidance, support or clarity on

- Defining flood zone 3b for fluvial flood risk, especially in areas of existing or planned development
- Whether the zones defined as areas of high, medium and low risk in the Environment Agency mapping 'Risk of flooding from surface water flooding' could correspond to the

equivalent planning zones (flood zones) used in the Flood Map for Planning (risk from rivers and the sea)

- How surface water, groundwater and reservoir sources of flood risk should be included in applying the sequential test
- How to rank sites at risk of flooding from multiple flood sources, so that the sequential test can be applied.

This prompted this research to then assess the viability of creating a national approach for applying the sequential test to surface water, groundwater and reservoir flood risk which is described below.

Exploring a national approach in England for applying the sequential test to surface water, groundwater and reservoir flood sources

Further analysis explored whether a national approach could be identified from the good practice found, for how to apply the sequential test to surface water, groundwater and reservoir sources of flood risk. The work also explored whether information could be developed for these flood sources equivalent to the flood zones for river and sea flood risk.

Interview findings demonstrated that LPAs understand the role of the SFRA to inform the sequential test. Of the shortlisted examples, 9 had applied the sequential test to surface water and/or groundwater flood sources, 2 examples applied the sequential test to reservoir flood risk, and 1 example applied it to artificial sources of flood risk (canals).

There was considerable variation in the approaches used by the 11 examples to rank potential development sites' risk from surface water, groundwater and/or reservoir flood risk. This reflected factors specific to each example's locality and the nature of the different sources of flood risk. These factors can be summarised as:

- The severity of the flood risk from each flood source - for example, the risks from reservoir flooding and surface water flooding are different in terms of both likelihood and resulting flood depths, velocity and damage
- The perceived ease with which the risk from each flood source could be mitigated - for example, there is a perception among practitioners that flooding from surface water or groundwater is easier to mitigate and therefore doesn't need as much weight given to it during site selection and strategic planning
- The robustness of the data used to assess the risk - for example, hydraulic modelling carried out to determine the risk of fluvial and sea flooding is more detailed and robust at a site-specific level than national or regional scale mapping of groundwater flood risk based on a high-level understanding of geology

In the examples, several LPAs (for example West London and Waverley) had sought to define what level of surface water or groundwater flood risk they considered to be equal to the fluvial flood risk in their local area defined by the published flood zones. Such examples covered both urban and rural locations. However, these examples were the exception and overall there was no strong reason to establish equivalent zones for surface water, groundwater or reservoir flooding and flood zones for river and sea flooding.

Instead, using a sequential approach within potential development sites was considered the main method of assessing flood risk rather than the sequential test that could result in excluding potential sites from accommodating new development.

The extent of the local level variation meant that, at this time, the research was not able to identify a robust, nationally consistent approach for applying the sequential test to surface water, groundwater and reservoir flood sources from the examples found. Nor was it able to identify any robust, nationally consistent equivalence between river and sea flood zones and zones for surface water, groundwater and reservoir flood sources. However, there is enough data available to apply a sequential approach for surface water, groundwater and reservoir flood risk in every SFRA, using an approach that is suitable to the local conditions.

To support this the existing SFRA guidance for England could better clarify that a sequential approach should be applied for surface water, groundwater and reservoir flood risk in all SFRAs, and the approach should be locally defined, clearly documented and implemented using the best available data. The LPAs should consult LLFAs and the Environment Agency on the proposed sequential approach.

Good practice criteria E: Cumulative impact of development on flood risk

Criteria description

Good practice (basic): Assesses cumulative risk, for example, how much flood storage has been lost historically; and/or

Identifies development limits to protect floodplain capacity to store flood water.

Specific policy/requirement/approach regarding urban infill/regeneration in areas at risk of increasing flood risk due to cumulative development.

Good practice (aspirational): LPA decision makers and committees actively discuss the potential cumulative impacts for all sites within flood risk zones and use interactive tools.

Examples

- Hart SFRA addendum
- Southampton Level 2 SFRA
- West London SFRA
- Manchester, Salford, Trafford Level 2 SFRA
- Leicestershire County and Leicester City SFRA
- Brighton and Hove Adopted Local Plan

Findings

Within the shortlist there were 6 examples where an approach had been established to either assess or address the cumulative impact of development. Differing approaches were adopted in each, with varying levels of detail and purpose.

The potential for cumulative impact of development on flood risk needs to be assessed, so an informed and appropriate strategy for any required measures can be developed to address the cumulative impact.

The interview results reported that assessing cumulative risk was not considered to be critical to inform housing allocation decisions nor in producing a local development plan and therefore was not seen by LPAs as an essential part of an SFRA.

Interviews found further guidance is desired on how cumulative impacts should be assessed and addressed.

What's needed to mainstream good practice?

- Guidance to clarify how an SFRA should assess the cumulative impact of development on flood risk and clarify an LPA's role in managing it
- Consider removing permitted development rights in areas that contribute to locations of high surface water flood risk
- Examine whether the SFRA is the best tool to meet the NPPF flood policy requirement to manage the cumulative impacts of flooding.
- Examine whether an LPA or an RMA is best placed to monitor and assess the cumulative impact of development on flood risk at a practical level, which can then be used to inform plan making.

Good practice criteria F: Accounting for future changes in flood risk

Criteria description

Good practice (basic): Identifies land that needs to be safeguarded for current and future FCERM use, for example, space for new/enlarged flood defences and/or recognition of future expansion of flood zones.

Incorporates climate change allowances into land allocation decisions.

Good practice (aspirational): Includes relocation policy – identifying locations that could be unsustainable in the future due to climate change and sites for relocating development in these areas.

Examples

- Hart SFRA Addendum
- Conwy SPD Coastal Flood Risk Protocol
- Southampton Level 2 SFRA
- Norfolk SFRA
- Huntingdonshire SFRA Online Mapping
- Waveney SPD
- Hull Local Plan SFRA

Findings

- Interviews and document analysis found widespread application of climate change allowances to river and sea flood risk in line with the Environment Agency guidance for flood risk assessments and climate change allowances (Environment Agency 2019). In many cases, where it is available, this is provided within the modelling outputs supplied by the Environment Agency for hydraulic modelling to use in SFRAs and flood risk assessments.
- The impact of climate change is routinely considered for flood risk from rivers by using model scenarios where defences present are included. However, it cannot be considered as showing “the extent of the flood zone including climate change” as requested in national planning policy because flood zones do not include the presence of defences and instead show the extent of the natural flood plain.
- To determine the impact of climate change on flood risk from surface water, a more extreme flood scenario (for example, the 0.1% AEP (1 in 1,000 chance of occurring each year) event) is routinely referred to, rather than carrying out any additional hydraulic modelling.
- No examples were found of accounting for climate change in assessing groundwater or reservoir flood risk.
- Interviews found that guidance is required on how climate change should be applied to groundwater and reservoir flood risk.

- There would be value in having a single national website where climate change mapping of future flood risk could be displayed.

What's needed to mainstream good practice?

- Guidance on if and how climate change should be applied to groundwater and reservoir flooding
- If 'future flood zones' taking into account climate change are to be a requirement of SFRAs, consider how this will impact the scope of river modelling studies in defended areas and make provision to include climate change scenarios for undefended scenarios
- Consider the best place for 'future flood zones' to be displayed; the SFRA or the Environment Agency Flood Map for Planning.

Good practice criteria G: Comprehensive scoping

Criteria description

Good practice (basic): Other LPA teams, RMAs and interested groups are consulted early to identify all known data, flood issues and opportunities that can be explored when producing the SFRA.

Examples

- Hull Local Plan SFRA
- Southampton Level 2 SFRA
- West London SFRA
- Hart SFRA Addendum
- Cambridgeshire SPD
- Norfolk SFRA
- North Glasgow IWMS

Findings

- Interviews and document analysis identified that the ultimate success of an SFRA depends on the quality of the work carried out in scoping and commissioning it.
- The research identified that a ‘produce first, consult later’ approach risks missing issues and opportunities that can be more challenging and expensive to incorporate later.
- Consulting with other LPA and LLFA teams during the scoping exercise (for example, on infrastructure planning, management of green spaces and development management), meant that ideas and information could be shared and cost and time savings made.
- The value of the flood risk information an SFRA and associated tools provides is greater than just informing a local development plan and development allocations. For example, it can be used to inform green space and SuDS strategies or criteria for raising and using funds from a Community Infrastructure Levy. Consulting with the LPA early helped inform other LPA teams and RMAs’ own work before, during and after the SFRA was produced.

What’s needed to mainstream good practice?

- Guidance on who to contact and how to engage with relevant partners.
- LPAs need to consult early and comprehensively on the scope of an SFRA.

Good practice criteria H-I: Wide spatial scale and collaborative working

Criteria description: H: Wide spatial scale assessment

Good practice (basic): Assesses flood risk at a river catchment or other flood catchment scale that is larger than a single LPA.

Good practice (aspirational): Demonstrates SFRA output quality and/or production efficiencies from assessing flood risk at a spatial scale wider than an LPA's boundary.

Examples

- Worcestershire Mineral Plan Technical Document
- West London SFRA
- Cambridgeshire SPD
- Leicestershire County and Leicester City SFRA
- Gloucester, Cheltenham, Tewkesbury SFRA
- Partnership for Urban South Hampshire (PUSH) SFRA
- Manchester, Salford, Trafford Level 2 SFRA

Criteria description: I: Collaborative working

Good practice (basic): Collaborative and holistic approach between LPA and RMAs to define the scope of an SFRA /other example so that it captures multiple opportunities to assess and address FCERM-related issues.

Good practice (aspirational): Close working between LPA planning policy team and development management teams to establish policy approach and ensure implementation through future development.

Examples

- Hart SFRA addendum
- North Glasgow IWMS
- West London SFRA
- Cambridgeshire SPD
- Norfolk SFRA
- Manchester, Salford, Trafford Level 2 SFRA
- Leicestershire County & Leicester City SFRA
- Gloucester, Cheltenham, Tewkesbury SFRA

Findings

- Collaboration between LPAs to produce an SFRA drives consistency in assessing flood risk where it goes beyond LPA boundaries, for example, large rivers, and facilitates more effective catchment management (Environment Agency, unpublished).
- How effectively an SFRA or sequential test assesses and manages flood risk often relies on how familiar the SFRA's lead within the LPA is with the available flood risk information and the SFRA guidance.
- Where an LPA's flood risk team leads the SFRAs, there is better understanding of what the SFRA is trying to achieve as well as the technical terminology used. Several interviewees highlighted that they were much more likely to manage the production of the SFRA well, whether in house or via external consultants, if they had previously worked for the Environment Agency (or potentially an LLFA or IDB) and therefore knew what was required and who to consult for advice.
- How successfully a SFRA is developed and implemented depends on the quality of the work carried out in its commissioning phase. Proactive, informed leadership that coordinates the input of data and advice from RMAs can create a comprehensive scope that captures all the known flood issues and opportunities that can be explored when producing the SFRA. A 'produce first, consult later' approach risks missing issues and opportunities that can be more challenging and expensive to incorporate later.
- There are potential opportunities to be gained from RMAs shifting from a reactive to a proactive role in supporting an LPA on its SFRA. For example, the LLFA, Environment Agency, water and sewerage companies and IDBs (where they exist in the LPA's area) can plan ahead to produce a future SFRA by gathering data and issues to explore that they can then provide to the LPA early in the commissioning phase so that a comprehensive scope to produce the SFRA can be prepared.
- One interviewee also identified that "the loss of local authority drainage teams has greatly reduced their flood risk knowledge and potentially impacted the quality of SFRAs and other flood risk policy".
- In some cases consultees charge for their time and data which can prevent early engagement. Staff availability present also presented a significant challenge, especially where the LLFA role is within a different department/council to the one preparing the SFRA.
- Differing timetables for councils preparing their LDPs are sometimes seen as a barrier to a number of LPAs working together to produce SFRAs. Moving to online SFRAs that are easier to keep up to date may make this more achievable.
- There is potential for other council departments and external partners to contribute funding for SFRAs and share costs where each derives tools and benefits for their own longer term uses.

What's needed to mainstream good practice?

- Those with roles and responsibilities for steering, commissioning, producing and using the SFRA understand how they can support collaboration
- Raise awareness of the opportunities associated with the role of leading SFRA commissioning and the role of RMAs in supporting how SFRAs are commissioned and produced
- Encourage SFRAs to be produced across catchments.

- Consider how consultees can better collaborate with LLFAs and LPAs, and how this could be made more efficient.
- Build on established flood risk forums/partnerships to encourage closer and earlier discussion between LPAs, LLFAs and the Environment Agency to plan in advance for future SFRA work.
- Use the research findings to inform skills/knowledge/capacity building with LPAs and LLFAs.

Good practice criteria J-N: Informing other plans, emergency planning, governance, net flood risk reduction

Criteria description: J: Addressing specific local flooding characteristics

Good practice (basic): Uses an approach that takes account of the context of flooding, for example, rapid speed of onset (flashy river or surface water run-off), and barriers to drainage (community being in a bowl or below sea level)

Examples

- South Downs SFRA
- Conwy SPD Coastal Flood Risk Protocol
- Southampton Level 2 SFRA
- Manchester, Salford, Trafford Level 2 SFRA
- East Riding of Yorkshire Flood Risk Note
- Wandsworth Local Plan Policy
- Shoreham Harbour SPD
- Hull Local Plan

Criteria description: K: Emergency planning

Good practice (basic): Specific policy/ requirement/approach for establishing whether a development is 'safe' (as defined in PPG: Flood risk and coastal change - GOV.UK (www.gov.uk)) to meet the requirements of the exception test. Should include requirements regarding access and egress, and response procedure from development occupants. Approach will vary depending on flood risk and nature of development.

Good practice (aspirational): Emergency planners, emergency service providers and Local Resilience Forums are consulted when the SFRA is being prepared, and can make use of the output.

Examples

- Southampton Level 2 SFRA
- Hull Local Plan

Criteria description: L: Governance

Good practice (basic): Governance is in place to make sure that the SFRA/ findings are shared with, and used by, appropriate teams, individuals or organisations in their plans, initiatives and policies.

Examples

- North Glasgow IWMS
- Southampton Level 2 SFRA
- West London SFRA
- Cambridgeshire SPD
- East Riding of Yorkshire Flood Risk Note
- Hull Local Plan (Policies 37-41, 43-44)

Criteria description: M: Informing other plans and strategies

Good practice (basic): The document/tool informs strategy, allocations and development management policies from the outset and is integrated into parallel processes, such as housing and economic land availability assessments and sustainability appraisals.

Good practice (aspirational): The document/tool is coordinated with future infrastructure planning, for example Green Infrastructure Plans, Community Infrastructure Levy.

Examples

- Hart SFRA addendum
- Worcestershire Mineral Plan Technical Document
- Southampton Level 2 SFRA
- West London SFRA
- North West Cambridge AAP
- Leicestershire County & Leicester City SFRA
- Northamptonshire Flood Tool Kit
- Cornwall SFRA and Local Plan Policy

Criteria description: N: Net flood risk reduction

Good practice (basic): Explores opportunities through development to reduce the causes and impacts of existing flood risk.

Good practice (aspirational): Has specific policy/requirement/approach.
Identifies geographic areas that could be used to achieve net gain, for example areas that would benefit from SuDS, river restoration of other natural flood management methods.

Examples

- North Glasgow IWMS
- Worcestershire Mineral Plan Technical Document
- Norfolk SFRA
- East Riding of Yorkshire Flood Risk Note
- Wandsworth Local Plan Policy
- Shoreham Harbour SPD
- Hull Local Plan (Policies 37-41, 43-44)
- Wiltshire Groundwater Management Strategy

Findings

- Interviewees presented conflicting views on the extent to which SFRAs should be used to develop specific local flood risk policies.
- Interviews found that SFRA recommendations need to be clearly written and easily understandable to enable planners to use them to write policy.
- Where drainage or flood risk specialists within the LPA worked closely with planners, the result was more useful recommendations and subsequently more useful policy.
- Interviews found that some development management officers are not suitably equipped to address flood risk issues as they arise in planning applications. Close working between the development management team and those involved in the LLFA role is required; this is often achieved more successfully in unitary authorities than across two-tier local authority structures.
- Interview and document analysis found good examples of local supplementary planning documents (SPDs) or advice notes where LPAs had established guidance for a specific area with specific flood risk issues. However, not all LPAs recognise the need for these.
- Interviews and document analysis found that some, but not all, SFRAs and SPDs clearly present the criteria that are required to demonstrate safe development.
- Interviews found relatively limited evidence of SFRAs being used to inform other plans and strategies; Infrastructure Delivery Plans, Green Infrastructure, Community Infrastructure Levy, and Suitable Alternative Natural Greenspaces.
- There was a perceived lack of coordination across three pieces of overarching legislation (the Flood and Water Management Act, Building Act, and Land Drainage Act), which hinders successful flood risk management. In order to achieve net reduction in flood risk and address the risk of cumulative impacts, all the infrastructure in any one development/area needs to be improved, for example, changes to drains/sewers considered alongside implementing SuDS to facilitate new developments.
- The current process of the 12 month LPA funding cycle was perceived to reduce the ability to produce plans for net flood risk reduction, as there is not enough time to put forward multiple developments at once.

What’s needed to mainstream good practice?

- LPAs establish local policies that go further than the requirement for ‘no increase in flood risk’ and achieve tangible net flood risk reductions.

- Examine whether there needs to be a trigger mechanism (in PPG or SFRA guidance) to provide a clear driver for when SPDs or a specific flood policy is required, so LPAs can see the need.
- There is a need to more coherently use flood risk information to inform other plans, to identify opportunities and funding mechanisms that can be used to achieve wider flood risk management and net gain in the local area. Examine whether this should be the role of the SFRA. Consider how this fits with the role of the local flood risk management strategies (LFRMS) prepared by LLFAs.
- Consider adding a bullet point in PPG Paragraph 010 to include ‘identify requirements for safe development’.

Good practice criteria O: Windfall development

Criteria description: O: Windfall development

Good practice (basic): Sets out requirements for windfall sites with respect to sequential testing and flood risk management.

Good practice (aspirational): Sets out requirements for windfall sites where there is particular flood risk or particular opportunities for improvement.

Examples

- Dover SFRA - Site Specific Guidance for Managing Flood Risk
- Sheffield City Core Strategy Policy CS67

Findings

- There were very few examples where an LPA had set out an approach for windfall sites.
- There was a perception that Level 2 SFRAs focus on an LPA's preferred allocation sites rather than all potential sites that may be proposed.
- Interviews identified the need for more guidance on the sequential test approach for windfall sites.
- One example (Dover) was identified where the LPA set out specific requirements for applying the sequential test to windfall sites. The guidance produced by the LPA included a map of the geographical areas of search that should be used, a list of documents from which applicants should identify alternative sites for comparison, and requirements for comparator assessments considering all sources of flooding.
- One example (Sheffield) was identified where the LPA had included a clause within its policy that prevented future residential development in high flood risk areas until a particular date, effectively applying the sequential approach for a particular time period.

What's needed to mainstream good practice?

- LPAs set out specific flood risk requirements for windfall applications in their administrative areas, including in the form of additional guidance.
- LPAs use time-bound policies that prevent new development in those highest flood risk areas.

Good practice criteria P: Document format and accessibility

Criteria description: P: Document format and accessibility

Good practice (basic): Easy access mapping at suitable scales for a range of users, for example, interactive PDFs or online mapping. Ability to easily update flood risk information and maps.

Good practice (aspirational): Document or tool has been applied to topics beyond the Local Development Plan.

Examples

- Hart SFRA addendum
- West London SFRA
- Conwy SPD Coastal Flood Risk Protocol
- Southampton Level 2 SFRA
- Cambridgeshire SPD
- Norfolk SFRA
- Manchester, Salford, Trafford Level 2 SFRA
- Northamptonshire Flood Tool Kit
- Huntingdonshire SFRA Online Mapping
- Cornwall SFRA and Local Plan Policy
- Waveney SPD

Findings

- The interviews found that SFRA formats that are easily understandable and accessible are potentially much more valuable to LPAs, RMAs, developers and communities.
- Web-based SFRAs and their associated mapping and checklists can be viewed and updated more easily. Moving to an online format makes these much more obvious to applicants as links can be provided in suitable locations on the LPA's website.
- Making SFRAs 'live documents' was seen as a challenge due to the costs of initially producing them (whether as a result of lots of hard copy mapping the costs to host an online mapping platform, and/or the costs for engagement). It can also be an issue if the maps are updated close to getting the Local Plan approved at examination, and the SFRA evidence base reporting versions correctly.
- Interviews found that the costs associated with online mapping platforms can be shared between LPA departments and/or external partners where SFRAs are prepared collaboratively.
- Other departments within the LPAs, such as those preparing Infrastructure Delivery Plans and Green Infrastructure Plans are more likely to use web-based SFRA products. This approach may also reduce the number of inappropriate planning applications and the associated LPA and RMA resource requirements.

What's needed to mainstream good practice?

- LPAs adopt online mapping for SFRAs.
- Maps of historic flooding and other data used by LLFAs for local flood risk management strategies should be shared to help LPAs produce SFRAs and avoid duplicating work and outputs.
- Consider how to create closer collaboration on flood-related spatial planning and RMAs' flood risk management work.

A summary of findings from deep-dive interviews

Findings from the analysis of examples and deep-dive interviews highlighted the following:

- In general, the current quality of SFRAs and sequential test examples was mixed
- There was no single outstanding example of a good practice SFRA or 'top 5' SFRA good practice examples identified in England
- There was no consensus among either planning or flood risk management practitioners in England or Scotland on what constituted good practice
- There were no particular clusters of good practice examples identified geographically or by local partnerships
- No good practice examples met all of the good practice criteria identified in Table 0-
- Relatively few good practice examples are considered exemplar for all of the good practice criteria identified in Table 0-
- The good practice examples that were identified had some elements that were judged as meeting the good practice criteria and the remaining elements judged as of average quality
- Good practice extended across 3 SFRA phases – commissioning, production and implementation

A summary of findings about skills, knowledge and guidance

Interviewees were asked a series of questions to ascertain feedback that could help inform the findings and recommendations from this study regarding skills, knowledge and guidance (existing or new).

The findings about the knowledge capacity among the LPAs were as follows:

- The quality of SFRAs and sequential tests often relies on a) how familiar the LPA is with local flood risk management issues and available information and b) the extent and timeliness that flood risk management authorities (RMAs) were requested to input to the SFRA process and provide supporting data and advice
- Where SFRAs were led within a LPA by the team with flood risk management skills and experience (for example, flood risk management teams in unitary authorities), there were often higher quality outputs than those led by another team
- The inadequate amount of guidance on how to apply the PPG and SFRA guidance and absence of associated training (such as webinars and workshops) formed a significant

obstacle to LPA staff learning or improving their skills and knowledge on how to apply the PPG and SFRA guidance in the real-life situations they regularly encounter

- The current strengths and obstacles to LPA staff having adequate skills and knowledge on how to effectively produce and use SFRAs mirrored those identified in the research FD2680 ‘Evaluation of the arrangements for managing local flood risk in England’ (Defra, 2017), which focused on LLFAs and their local flood risk management roles. Examples of current strengths identified included skills on partnership working, data and information sharing and communication with the public. Examples of obstacles identified included inadequate staff and budget resources to gain and maintain the required skills and knowledge.

The findings regarding SFRA guidance were as follows:

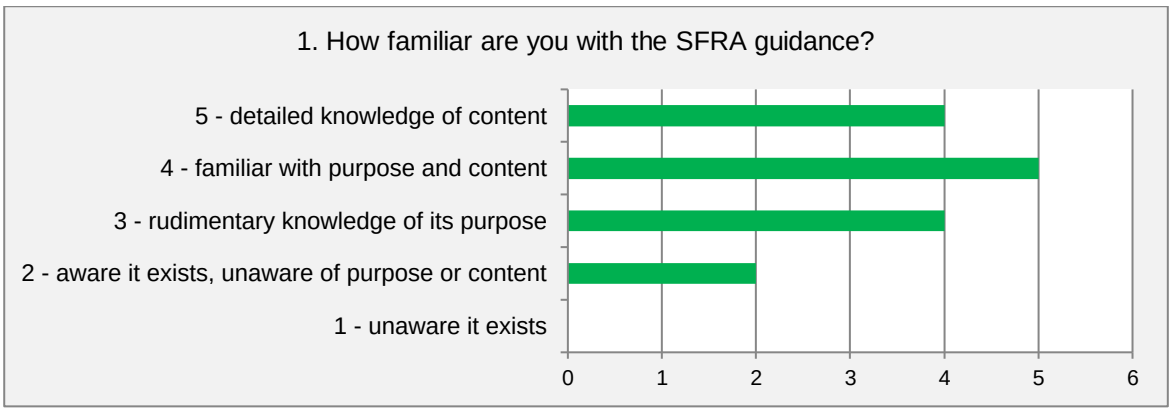
- Overall, the now withdrawn PPS25 Practice Guide was viewed favourably both in its scope and level of detail. It was frequently noted in interviews that the current NPPF and PPG do not provide the same level of detailed guidance on a range of SFRA-related topics and additional guidance was desired. However, the Practice Guide was seen as a large and complex document to follow. As PPS25 Practice Guide has been superseded by the NPPF and PPG, interviewees requested clarification on the status and relevance of the PPS25 Practice Guide.
- The existing guidance (PPG and Environment Agency’s SFRA Guidance) does not explain to planners how to use SFRAs to secure flood risk benefits. Wider sustainability benefits in relation to the sequential and exception tests are also often not communicated.
- The majority of sequential tests are based solely on river and sea flood risks. Some SFRAs seek to consider other flood sources but each adopts a different approach. The guidance states that the sequential test should consider all sources of flooding but there is no tool in the sequential test to make sure all sources of flood risk are considered. All SFRA authors stated that there is little clarification on applying the test to all sources of flooding. It is noted that, overall, data sets for the other flood sources contain less detail and/or less robust data. This could make it difficult to produce effective guidance on applying the sequential test to those other flood sources (surface water, groundwater, reservoir and sewer).
- There is not enough guidance in the PPG for windfall sites, therefore this is often not incorporated into SFRAs. There is a perception that an SFRA’s purpose is to focus on the LPA’s housing allocations rather than also assessing the potential for other housing proposals. There is pressure to meet the housing targets and allow for windfall developments, despite the flood risk.
- Guidance and training in forms like webinars and/or face-to-face workshops would help improve knowledge and fully embedded good practice.

Additional evidence gathering on needs for guidance

The interviewees were asked 5 further quantitative questions about guidance to explore the findings. The responses are shown in Figures 3-1 to 3-5 and bullet points below.

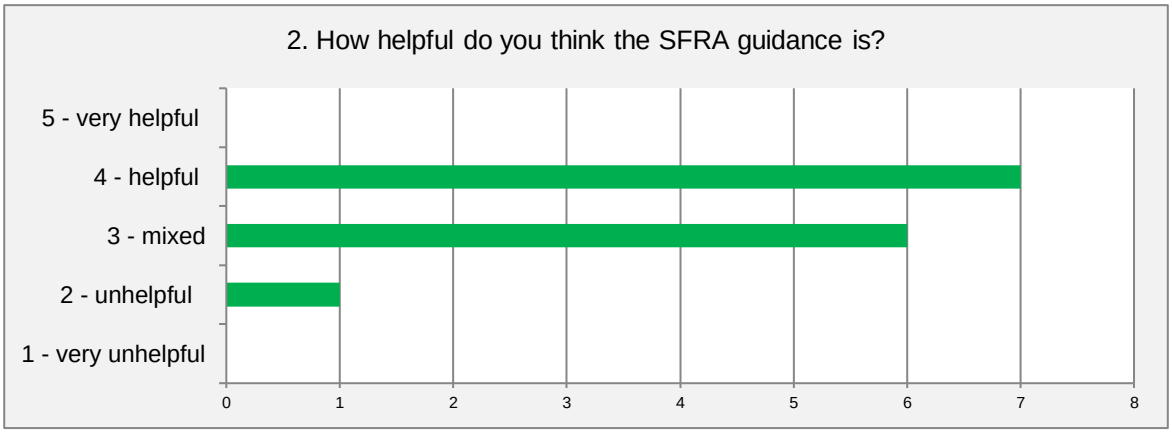
Some interviewees felt unable to provide an informed answer to certain questions and therefore the total number of responses for each question varies.

Figure 0-1 Results from interview question 1



Question1. All the interviewees were aware of the Environment Agency's SFRA guidance webpage[3]. The level of familiarity with it varied. Local authority flood risk management practitioners tended to have a more detailed understanding than spatial planners.

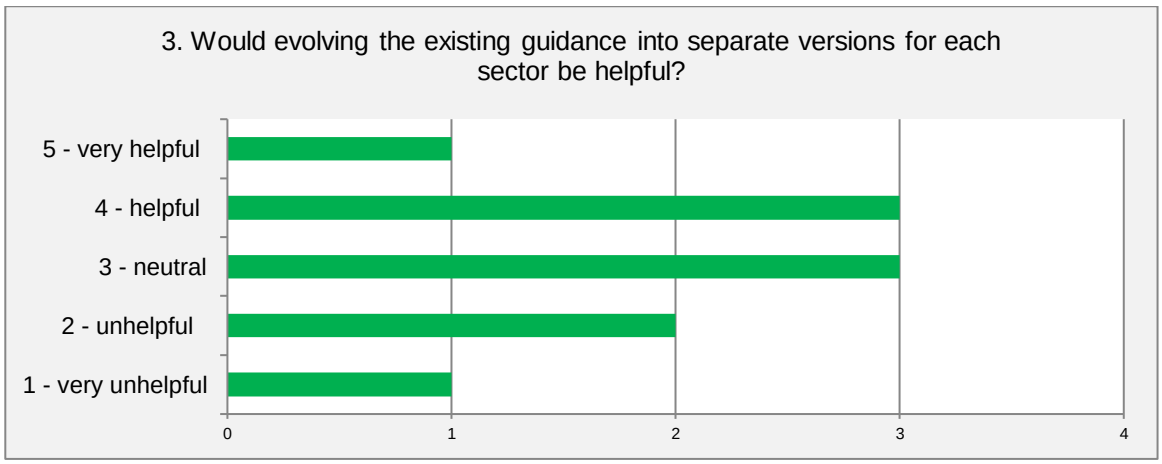
Figure 0-2 Results from interview question 2



Question 2. Approximately half of the people questioned felt the current SFRA guidance was helpful, while the other half considered it 'mixed' or unhelpful. The reasons for this included that the language was too technical, the guidance was too complex, and not comprehensive nor detailed enough compared to the previous PPS25 Practice Guide.

Figure 0-3 Results from interview question 3

[3] How to prepare a strategic flood risk assessment, https://www.gov.uk/guidance/local-planning-authorities-strategic-flood-risk-assessment

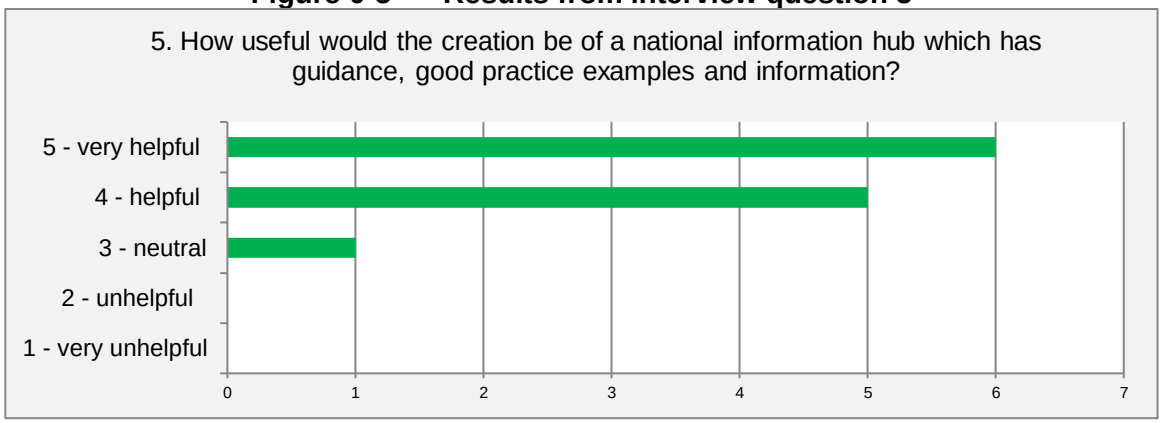


Question 3. Views were mixed as to whether 2 separate versions of the SFRA guidance should be produced; one for a spatial planning audience and one for a flood risk management practitioner audience. In general, it was considered that the guidance does need to be technical, but that there were particular elements that were missing or needed to be improved and clarified. However, there was no consensus whether creating separate versions was the best way to address those points.

Figure 0-4 Results from interview question 4

Question 4. Overall, the interviewees considered their LPA's SFRA had been adequately understood and implemented. SFRA implementation appears to currently focus on informing the local plan. Only one example (Hull) had done more than that to date. However several interviewees considered that their SFRAs could possibly do that in the longer term, for example informing green space and SuDS strategies or criteria for raising and using funds from a Community Infrastructure Levy.

Figure 0-5 Results from interview question 5



Question 5. There was a strong consensus in favour of creating easily accessible information, sharing good practice examples and techniques for commissioning, developing and implementing SFRAs.

What's needed to improve guidance and enhance capacity building?

There are opportunities to share good practice collated in this work and share this to support skills development, knowledge sharing and encourage collaboration. It is intended that this research will be used to inform updates to the Environment Agency's SFRA guidance, supported by a good practice user guide to enhance capacity building. The following observations from this project should be used to help improve guidance and capacity building:

- Guidance on how to produce and use SFRAs needs to better integrate engineering design advice and technical flood advice.
- Guidance is needed on the types and reliability of data that can be used to assess sources of flooding other than fluvial and coastal risks.
- Clearer guidance is needed for a national coherent approach to considering all sources of flooding in the sequential test, assessing cumulative impact, achieving net risk reduction, incorporating climate change and protecting and enhancing biodiversity. This would allow each flood source across different SFRAs to be consistently assessed, with particular benefits for those within the same catchment area (be it a river or surface water catchment, groundwater aquifer).
- The sequential approach for flood sources other than fluvial and coastal should be locally defined, clearly documented and implemented using the best available data. The LPAs should consult LLFAs and the Environment Agency on the proposed sequential approach.
- Support (guidance/training/capacity building) should be provided to LPAs for better using the findings to feed into other plans and strategies, for example, Infrastructure Delivery Plans, Funding Statements and Green Infrastructure.
- Any SFRA or planning guidance should have a strong status in the planning system and with the Planning Inspectorate, for example by having 'recognised guidance' status.
- To cater for different audiences guidance or training should be tailored and widely available (e.g. if a guidance document it should have an easy to use navigation between and within sections similar to that used in the SuDS Manual).

- Any new or revised guidance on how to produce and use SFRAs should be published and accompanied by awareness raising and training initiatives to embed the associated skills and knowledge within LPA staff and RMA partners, where relevant.
- SFRA skills and knowledge requirements of LPAs should be included alongside LLFAs in future flood risk management skills/knowledge/capacity surveys.

Conclusions

The conclusions from this research (conducted in 2018 and 2019) are summarised below. They focus on spatial planning and flood risk arrangements in England. They should help to inform the National Flood and Coastal Erosion Risk Management Strategy for England (Environment Agency 2020), specifically the objective of getting the right kind of development in the right places to achieve sustainable growth and communities that are resilient to flooding now and in the future.

The limited sample of documents reviewed and lack of deep dive interviews relating to Wales meant that a representative analysis could not be carried out on the content and implementation of SFCAs in Wales. This is discussed earlier.

Current tools

The findings identify that SFRAs and sequential tests are being prepared throughout England to support the preparation of Local Development Plans. Significantly more SFRAs have been produced since the 2009 review and a notable level of detailed information is often produced, with widespread consideration of climate change.

LPA officers understand the need for an improved flood risk evidence base to support the local plan and robust testing of potential development sites prior to allocation. The need to consider all sources of flooding and the impact of climate change is also well known. However, the ability of LPAs to consider them fully is constrained by a lack of guidance relevant to surface water, groundwater and reservoir flood sources.

This research found that there was no national or regional consensus on what comprised ‘good practice’ for either the process of producing an SFRA or the resulting outputs (for example, maps and reports). The lack of consensus of any recognised ‘top 5’ or even single good practice SFRA was also notable among national and local spatial planning and flood risk management practitioners.

Applying the good practice criteria defined by this research, relatively few SFRAs - approximately 20% of those reviewed - were found to meet a good or very good standard of practice. Of those SFRAs that were identified, only a number of elements in each were found to comprise good practice, with the remaining elements deemed of average quality. No single SFRA reviewed displayed all of the 16 good practice criteria. However, while this research found that planning and flood risk management practitioners did not know of any definitive list of ‘go to’ exemplar SFRAs, there were enough SFRAs that displayed one or more of the good practice criteria. The reasons for this were described earlier in this report. Lack of skills and resources, limited guidance or relatively recent changes to NPPF and PPG that change requirements for certain SFRA elements from discretionary towards mandatory, are some of the reasons given.

No large suite of ‘tried and tested’ good practice SFRAs was identified, as had been anticipated by the Environment Agency at the start of this research. This finding informed

further questioning in interviews about the need for a good practice evidence base for using flood risk information in spatial planning.

SFRA purpose

The interviewees generally considered the SFRA's main purpose is to support the LPA prepare and apply the Local Development Plan. This is used to apply the sequential test and where relevant the exception test.

As well as this, the current PPG and SFRA guidance sets a number of requirements for the SFRA, which are more far reaching and less well understood. This is either because supporting information is not readily available or because the approach to address these issues has not been implemented or communicated widely. These issues include considering the cumulative impact of development on flood risk, identifying opportunities to achieve a net reduction in flood risk and applying the sequential test for windfall development.

While it is clear that it may be useful to consider these issues, LPA officers producing or commissioning SFRAs do not often prioritise them because they do not directly inform the application of the sequential test and/or there is limited guidance available on how to do it efficiently and effectively.

Greater collaboration with the LLFA or Environment Agency in the early scoping phase, and re-use of data held by others, could support the LPAs to establish the local flood risk context, assess cumulative impacts and identify net flood risk reduction opportunities. Datasets could be established for any strategic plan or risk assessment at a catchment, LLFA or LPA scale so that these can be used by the LPA in their SFRA, as opposed to the SFRA being the delivery tool for this information.

Available guidance

The findings show how much LPA officers rely on the PPG and guidance published by the Environment Agency when they prepare an SFRA. While many were aware of the SFRA guidance, fewer officers understood it well and applied it effectively. This was more notable among LPA planning officers than flood risk management officers within a unitary council. A need for updated or additional guidance was identified, particularly for a range of issues such as how to consider the impact of climate change for groundwater and reservoir flood risks, methods for considering all sources of flood risk when applying the sequential test, assessing the cumulative impact of development on flood risk, and providing requirements for applying the sequential test to windfall development.

DLUHC and the Environment Agency regularly revise the PPG and SFRA guidance. Interim findings from this research have been used to inform DLUHC's ongoing (2019 to 2020) review of PPG. It also informed the Environment Agency's revised version of the SFRA guidance published in August 2019.

Flood risk knowledge and capability

The evidence from this research identifies varying levels of flood risk expertise among those involved in commissioning SFRAs.

The SFRA is mainly used to support the preparation of the LDP as part of the strategic spatial planning process. Therefore, those in charge of commissioning SFRAs do not always have a flood risk background or fully understand PPG's aim for an SFRA to go beyond the requirements of informing the sequential and exception tests. Considering other elements within their scope is therefore more limited, such as for development management and opportunities to reduce existing levels of flood risk.

A number of previous surveys and subsequent analysis (for example FD2680 Evaluation of the arrangements for managing local flood risk in England (2017)) have looked at the range of flood risk management skills and capacity within the local authority sector. Examining the influence of current local authority sector flood risk management skills and capacity is outside the scope of this research. However, the findings indicate that it would be beneficial to include LPAs and topics such as effective commissioning, developing and using SFRAs within future surveys and training materials.

The research identified that, where the LPA is also the LLFA, there was flood risk expertise to help with scoping and commissioning the SFRA. There was also capability to implement the SFRA so that the findings were translated into policy and/or supplementary planning guidance, and subsequently enforced.

Benefits to time, budget and quality were realised where LPAs had consulted other RMAs early in the SFRA process and used their technical advice and data. Early engagement was beneficial to all parties. LPAs could benefit from the range of evidence, data and advice from RMAs, and the RMAs, by investing time to develop SFRAs, could deliver good outcomes for flood risk management.

However, there were also some perceptions that some RMAs, particularly the Environment Agency charging for non-statutory activity, prevented some LPAs from consulting with them effectively to seek advice when commissioning an SFRA, beyond their request for data. In two-tier local authority situations where the LPA is not an RMA there is an additional layer of complexity for data sharing and collaboration. However, there were examples where this has been successful.

Evidence to quantify the value of early engagement in the SFRA process to both LPAs and the RMAs, should be gathered and shared to encourage this practice.

Roles and responsibilities

District Councils are planning authorities and are responsible for developing the local plan, evidenced by a Strategic Flood Risk Assessment (SFRA).

The Environment Agency are not statutory consultees on SFRAs, but can provide data and information to support the SFRA process. Time for non-statutory work (resources at meetings for example) may be chargeable.

PPG outlines that LPAs should work with LLFAs to secure local development plan policies that are compatible with the local flood risk management strategies (LFRMS) to manage the local sources of flood risk, including from surface water, groundwater and ordinary watercourses. The findings from this research reinforced the benefit of LPAs and LLFAs liaising early on this matter.

Furthermore, the LLFA often has a lot of practical knowledge and expertise about the flooding mechanisms in the area, and details of planning applications for proposed new development. During interviews carried out for this research, the role of the LLFA in helping to achieve a number of the elements of the SFRA (and to a good practice standard) was discussed. For example, the LLFA can consider the cumulative impact of development on flood risk and identify areas that should be safeguarded for future flood risk management schemes. Benefits and efficiencies were identified by the LLFA being involved in the ongoing assessment and management of these issues. This allowed the LPA spatial planning team to come and take a ‘snapshot in time’ to inform their local plan production, rather than the SFRA driving the approach and timetable. Resources to provide this advice differ between LLFAs and, where it is limited, is often a constraint to providing support to LPAs.

The research found the quality of an SFRA improves if the LPA leads and consults early with RMAs to capture all known flood issues and opportunities. This can then inform how the SFRA is produced. A ‘produce first, consult later’ approach risks missing issues and opportunities that can be more challenging and expensive to incorporate later.

There are also quality and efficiency benefits to be gained from RMAs taking a more proactive role in supporting an LPA with its SFRA. For example, the RMAs can anticipate when an SFRA will be produced or updated and prepare data (including confidence information) to input early into the LPA’s SFRA commissioning phase.

Importance of commissioning phase

The research identified that the success of an SFRA in terms of how it is scoped, produced and subsequently implemented greatly depends on its commissioning phase. The LPA, LLFA, Environment Agency and other relevant RMAs working together early on significantly improves the quality and comprehensiveness of the scope for producing an SFRA (whether in-house by an LPA or externally) and helps save time and money.

SFRA accessibility and usability

Flood risk data and SFRAs are now much more accessible and easy to use since the 2009 SFRA review (Defra 2009). The Environment Agency, LLFAs and other RMAs have made many more national data sets and maps available. More SFRAs are being produced with online mapping platforms or interactive PDF documents that make navigating reports

and extensive data sets over large geographic areas much simpler. Being able to keep data up to date also provides SFRA outputs that can be kept ‘live’.

Where SFRA information is accessible and displayed clearly, it can improve usability and understanding which then facilitates better engagement with communities and interested groups in flood risk areas. This can increase awareness and uptake of resilience measures by other sectors in their work and plan making. This may particularly be the case where SFRA outputs include flood risk maps that show future flood risk areas that are predicted to result from climate change, something not currently available nationally.

Short and long-term SFRA implementation

The interviews highlighted the need for LPA officers to take the recommendations of the SFRA and make sure they are fully implemented. Recommendations must be appropriately translated into policy and development management requirements in order to achieve results.

It was found that where LPAs worked closely with LLFAs there was often more success in establishing local flood risk policy, as well as subsequently enforcing the policies on individual planning applications.

Producing supplementary planning guidance documents that had been prepared by or on behalf of LPAs were seen as good practice in setting out the specific flood risk requirements for new development or redevelopment in a particular area. However, it was noted during the interviews that the need for, and value of, supplementary guidance was not consistently identified by LPAs and guidance on when it should be prepared would be helpful to them.

The research identified that most interviewees felt that SFRAs could be applied more widely to flood risk management work (beyond its main purpose of informing the sequential test, local development plan and its associated housing allocation) in the local area. Carefully considering the scope of an SFRA means it can potentially be a tool that address a range of flood risk issues over a longer time period and wider geographic scale (for example, river catchment) than those used to inform a local development plan. Producing an SFRA that both LPAs and RMAs can use could save time and money if it is clearly presented indicating which information is needed for managing risks to and from new development (SFRA), and managing existing risks (RMAs).

Recommendations

The Environment Agency will consider the following overall recommendations in the context of spatial planning and flood risk in England. The recommendations are based on the findings from this research, completed in 2018-2020. It should be noted that these combine some of the detailed recommendations from earlier sections and those from the reviews of the PPG and SFRA guidance.

These were later reviewed and updated as the project progressed. Some changes were made to the Environment Agency SFRA guidance (Environment Agency 2019) based on these recommendations. The final recommendations are made in the project report FRS18204/R1 (Appendix A).

A separate report on recommendations for Wales has been produced as part of this research. These recommendations are set out in the project report FRS18204/R1 (Appendix B).

Guidance on producing and using SFRAs

The project team who prepared the report make the following recommendations for updating or providing new guidance based on the findings of this report:

1. Revise existing PPG and SFRA guidance to provide equal guidance for all flood sources.

2. Provide guidance on how climate change allowances are to be applied to groundwater and reservoir flood sources.

3. Provide guidance on how the sequential approach and/or the sequential test is applied to surface water, groundwater and reservoir flood sources and to locations with multiple sources of flood risk.

4. Consider if strengthening the status of SFRA guidance in the planning system would improve the quality of SFRAs and local plan housing allocation decisions.

5. Provide guidance on how LPAs should assess and address reducing existing flood risk (net gain) and the cumulative impact of development on flood risk within an SFRA.

6. Provide guidance on how LPAs should address windfall sites within SFRAs and how to apply the sequential test to windfall sites.

7. Review the benefits of adding future flood zones that include climate change allowances and other flood sources into the national Flood Map for Planning.

8. Improve links within PPG and SFRA guidance to flood risk research publications FD2320 & FD2321 for information on defining flood hazard and safe development.

9. Examine the benefits of introducing a trigger mechanism in PPG or SFRA guidance to clarify for LPAs when supplementary planning guidance or a specific local flood policy (including SuDS) is required.

10. Highlight the benefits of using SFRAs to inform other plans and strategies, for example, Infrastructure Delivery Plans and Green Infrastructure Plans.

11. Raise awareness that the PPS25 Practice Guide has been withdrawn and should no longer be used.

12. Improve awareness and interpretation of existing guidance and share good practice examples.

Roles and working together

The project team who prepared the report make the following recommendations for providing evidence for improving working practices based on the findings of this report:

1. Explore how to raise awareness of the opportunities arising from LPAs consulting early and comprehensively with partners on the scope of an SFRA.
2. Explore how the role of RMAs can be improved in supporting LPAs in SFRA commissioning and production.
3. Provide evidence and advice on the benefits and dis-benefits of LPAs working in partnership to commission and produce joint SFRAs.
4. Review the options for the most effective arrangements and tools to assess the cumulative impact of development and opportunities for net reductions in flood risk to best inform SFRAs delivered by LPAs.

SFRA format

The project team who prepared the report make the following recommendations for providing evidence and advice for improving SFRAs based on the findings of this report:

1. Provide evidence and advice on the benefits and efficiencies of producing SFRAs in an easily accessible, online format.

2. Provide advice on how SFRA online formats can improve awareness of them and uptake by developers to inform their development proposals.

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List of abbreviations

ADEPT	Association of Directors of Environment, Economy, Planning & Transport
CIRIA	Construction Industry Research and Information Association
CIWEM	Chartered Institution of Water and Environmental Management
Defra	Department for Environment, Food & Rural Affairs
DLUHC	Department for Levelling Up, Housing and Communities
FCERM	Flood and coastal erosion risk management
ICE	Institution of Civil Engineers
IDB	Internal drainage board
IWM	Integrated water management
LFRMS	Local flood risk management strategy
LDP	Local development plan
LPA	Local planning authority
LLFA	Lead local flood authority
MHCLG	Ministry of Housing, Communities & Local Government
NDF	National Development Framework (Wales)
NPPF	National Planning Policy Framework
NRW	Natural Resources Wales
PPG	Planning practice guidance
PPS25	Planning Policy Statement 25
PPW	Planning Policy Wales
RMA	Risk management authority
RTPI	Royal Town Planning Institute
SEPA	Scottish Environment Protection Agency
SFCA	Strategic flood consequences assessment
SFRA	Strategic flood risk assessment
SPD	Supplementary Planning Document
SPG	Supplementary Planning Guidance

SuDS	Sustainable drainage systems
TAN	Technical Advice Note (Wales)
TCPA	Town and Country Planning Association

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Contributors and reviewers:

- The local council officers who were interviewed as part of this research
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- National Flood Forum: Paul Cobbing
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Appendix A: National documents reviewed

Document name	Owner	Topic	Tool
Planning Policy Statement 25: Development and Flood Risk Practice Guide	Department for Communities and Local Government (now Ministry of Housing, Communities & Local Government)	Flood risk planning policy	Planning guidance document
Planning Policy Statement 25 Supplement: Development and Coastal Change Practice Guide	Department for Communities and Local Government (now Ministry of Housing, Communities & Local Government)	Coastal flood risk planning policy	Planning guidance document
Environment Agency objections to planning	Environment Agency	Planning decisions granted in flood risk areas	Flood guidance document
FD2320 - Flood Risk Assessment Guidance for New Development - Phase 2	England-Wales FCERM R&D Programme	Flood risk assessment guidance	Research
National Planning Policy Framework 2018	DLUHC	Planning policy	Planning guidance document
Planning practice guidance - Flood risk and coastal change	DLUHC	Flood risk planning policy	Planning guidance document
FD2603 - Risk assessment and risk management in small urban catchment areas	England-Wales FCERM R&D Programme	Non-structural measures for flood mitigation of a small urban catchment	Research

Document name	Owner	Topic	Tool
		(Heywood, Greater Manchester)	
FD2605 – Social justice in the context of flood and coastal erosion risk management: a review of policy and practice	England-Wales FCERM R&D Programme	Review of policy against social justice principles	Research
FD2010 - Flood Plain Management Manual (Phase 1)	England-Wales FCERM R&D Programme	Flood plain management	Research
SC070059 - Framework and Tools for Local Flood Risk Assessment	England-Wales FCERM R&D Programme	Calculating flood risk metrics	Research
FD2610 - Land Use Planning - Quality and Influence of Strategic Flood Risk Assessments in the Planning Process	England-Wales FCERM R&D Programme	Assessment of the quality of SFRAs since the introduction of PPS25	Research
RP1055 - Code of Practice and guidance for property flood resilience	CIRIA	Property flood resilience	Flood guidance document
C751 Communication and engagement in local flood risk management	CIRIA	Engagement in flood risk management	Research
FRA guidance - flood risk assessment for planning applications	Environment Agency	Flood risk assessment guidance	Flood guidance document
SFRA guidance - local planning authorities: strategic flood risk assessment	Environment Agency	Strategic flood risk assessment guidance	Flood guidance document

Document name	Owner	Topic	Tool
FRA guidance - flood risk assessments: climate change allowances	Environment Agency	Flood risk assessment guidance	Flood guidance document
A review of the application and effectiveness of planning policy for sustainable drainage systems (SuDS)	DLUHC	SuDS	Research
BS 8533:2017 Assessing and managing flood risk in development. Code of practice	British Standards Institute	Flood risk assessment guidance	Flood guidance document
Susdrain	Susdrain	SuDS	Flood guidance document
RP1057 Delivering better water management study (C787F)	CIRIA	Integrated water management	Research
C624 Development and flood risk - guidance for the construction industry	CIRIA	Flood risk assessment guidance	Research
C752 Communication and engagement techniques in local flood risk management: companion guide	CIRIA	Engagement in flood risk management	Research
C738a Managing urban flooding from heavy rainfall - encouraging the uptake of designing exceedance: recommendations and summary	CIRIA	Urban flood management (based on case studies)	Research
C635 Designing for exceedance in urban drainage - good practice	CIRIA	Urban sewerage and drainage	Research

Document name	Owner	Topic	Tool
C724 Creating water sensitive places - scoping the potential for water sensitive urban design in the UK	CIRIA	Integrated water management	Flood guidance document
Land Use Planning for Urban Flood Risk Management	Urban Floods Community of Practice	Integrated water management	Flood guidance document
Welsh Government Local Development Plan Manual Edition 2	Welsh Government	Planning policy	Planning guidance document
Planning Policy Wales, Edition 9 and Edition 10 (Now withdrawn and replaced with Edition 11)	Welsh Government	Planning policy	Planning guidance document
Planning Policy Wales: Edition 11 (February 2021)	Welsh Government	Planning policy	Planning guidance document
Draft National Development Framework 2020 to 2040	Welsh Government	National spatial plan	Planning guidance document
Future Wales: the national plan 2040	Welsh Government	National Development Framework	Planning policy
Technical Advice Note (TAN) 14: Coastal Planning	Welsh Government	Flood risk planning policy	Flood guidance document
Technical Advice Note (TAN) 15: Development and Flood Risk	Welsh Government	Flood risk planning policy	Flood guidance document
The Town and Country Planning (Notification) (Wales) Direction 2012	Welsh Government	Planning policy	Planning guidance document

Document name	Owner	Topic	Tool
Welsh Government Letter to Chief Planning Officers: Planning Policy on Flood Risk and Insurance Industry Changes & Annex: Summary of what TAN15 requires for highly vulnerable development (houses) to be considered acceptable	Welsh Government	Flood risk planning policy	Flood guidance document
PJ/CPO04032015TAN2015 NRW Letter to Chief Planning Officers: TAN15: Development and Flood Risk	Natural Resources Wales	Flood risk planning policy	Flood guidance document
Evaluation of Technical Advice Note (TAN) 15: Development and Flood Risk	Welsh Government/ BA Consulting	Evaluation of flood risk policy	Research
Welsh Development Advice Maps (DAMs)	Welsh Government	Flood risk interactive map	Interactive website
Review of local approaches to surface water flood risk management	Defra	Surface water flood risk management	Research
SEPA - Planning Authority Protocol (Policy 41)	SEPA	Flood risk planning policy	Flood guidance document
Land Use Planning System SEPA Guidance Note 9	SEPA	Planning policy	Planning guidance document
SEPA Planning Background Paper: Flood Risk	SEPA	Flood risk planning policy	Flood guidance document
Surface water management planning guidance	SEPA	Flood risk planning policy	Flood guidance document

Document name	Owner	Topic	Tool
Groundwater flooding summary: Methodology and Mapping	SEPA	Flood risk assessment guidance	Flood guidance document
SEPA Flood Maps	SEPA	Flood risk assessment guidance	Interactive website
Land Use Planning System SEPA Guidance Note 8	SEPA	Planning policy	Planning guidance document
Assessing the consideration of flood risk by Scottish local planning authorities	ClimateXChange	Flood risk assessment guidance	Research
Scottish Planning Policy	Scottish Government	Planning policy	Planning guidance document
Flood risk management strategies	SEPA	Flood risk planning policy	Flood guidance document
Strategic Flood Risk Assessment: SEPA technical guidance to support development planning	SEPA	Flood risk assessment guidance	Flood guidance document
Flood risk planning advice note	SEPA	Flood risk planning policy	Flood guidance document
Flood Risk and Land Use Vulnerability Guidance	SEPA	Flood risk planning policy	Flood guidance document
SEPA Planning Information Note 4	SEPA	Flood risk planning policy	Flood guidance document

Document name	Owner	Topic	Tool
The Scottish Flood Defence Asset Database	SEPA	Flood defence database	Interactive website
National Flood Risk Assessment 2	SEPA	Flood risk assessment guidance	Flood guidance document
National Coastal Change Assessment	SEPA	Coastal change	Interactive website
C753 The SuDS Manual	CIRIA	SuDS	Flood guidance document
W045 Benefits of SuDS Tool	CIRIA	SuDS	Flood guidance document
C768 Guidance on the construction of SuDS	CIRIA	SuDS	Research

Appendix B: Good practice examples

The table below shows the good practice examples collated for the long list, ranked in the shortlist and analysed further with research and interviews.

Name	Owner/ client	Tool
A1 Dishforth to Barton upgrade to motorway standards	Highways England	Project example
Anchwood Bank, Barnstaple	North Devon District Council	Planning guidance document
Arun Local Plan (Policies G1 SP1, WSP1, WDM1, WDM3 and HSP2c)	Arun District Council	Planning guidance document
Arun Stage 1 and Stage 2 Strategic Surface Water Management Study	Arun District Council	Flood guidance document

Name	Owner/ client	Tool
Asda Supermarket, Leicester	Asda, Leicester City Council, ISG and ACO Water Management	Project example
Bedford SuDS SPD	Bedford Borough Council	Flood guidance document
Belfast Flood Alleviation Improvement project	Belfast City Council	Project example
Belfast Green and Blue Infrastructure Plan	Belfast City Council	Planning guidance document
Brighton and Hove Adopted Local Plan (Policy CP 11)	Brighton and Hove City Council	Planning guidance document
Brighton and Hove breaking silo thinking (LP7 of Adopted Local Plan)	Brighton and Hove City Council	Planning guidance document
Broads Flood Risk SPD	Broads Authority	Planning guidance document
Cambridge Draft Local Plan (Policy 31)	Cambridge City Council	Planning guidance document
Cambridge SuDS Design and Adoption Guide	Cambridge City Council	Flood guidance document
Cambridgeshire Flood and Water SPD	Cambridgeshire County Council	Flood guidance document
Canal and North Gateway	Glasgow City Council	Project example

Name	Owner/ client	Tool
Central Bedfordshire SuDS Guidance	Central Bedfordshire Council	Flood guidance document
Channel Naturalisation on Swindale Beck	RSPB, United Utilities, Environment Agency and Natural England	Project example
Chichester Level 1 SFRA	Chichester District Council	Flood guidance document
City of York SFRA	City of York Council	Flood guidance document
Clay Farm, Cambridge	Cambridge City Council	Project example
Clwyd St, Rhyl, Decision Notice	The Planning Inspectorate Wales	Planning guidance document
Conwy SPD LDP27: Coastal Flood Risk Protocol	Conwy County Borough Council	Flood guidance document
Cornwall Level 1 SFRA	Cornwall Council	Interactive website
Cornwall Local Plan Strategies Policies 2010 to 2030	Cornwall Council	Flood guidance document
Cranbrook and Sherford Garden Towns built around the watercourse and SuDS	East Devon District Council	Project example
Denbighshire Strategic Flood Consequence Assessment update	Denbighshire County Council	Flood guidance document
Designing Rain Gardens: A practical guide	Urban Design London	Flood guidance document

Name	Owner/ client	Tool
Development Framework for Blindwells New Settlement	East Lothian Council	Planning guidance document
Dover District Council SFRA - Site Specific Guidance for Manging Flood Risk	Dover District Council	Planning guidance document
Dundee City Council SFRA	Dundee City Council	Flood guidance document
East Hampshire SFRA	East Hampshire District Council	Flood guidance document
East Renfrewshire SPD: Maidenhill Master Plan	East Renfrewshire Council	Planning guidance document
Elmbridge Borough Council Flood Risk SPD	Elmbridge Borough Council	Flood guidance document
Exeter Science Park growth area built around the watercourse and SuDS	East Devon District Council	Project example
Fletton Quays, Peterborough	Peterborough City Council	Project example
Flintshire SPD LPGN 29 - Management of surface water for new development	Flintshire County Council	Flood guidance document
Greater Exeter Strategic Plan	Local planning authorities of East Devon, Exeter, Mid Devon and Teignbridge with Devon County Council	Planning guidance document
Greenwich SFRA - Appendix F: Guidance for housing development in areas of high residual flood risk	London Borough of Greenwich	Planning guidance document

Name	Owner/ client	Tool
Hadnock Rd, Monmouth, Decision Notice	The Planning Inspectorate Wales	Planning guidance document
Harrow SFRA and associated mapping	Harrow Council	Flood guidance document
Hart SFRA Addendum - Sequential Test document	Hart District Council	Planning guidance document
Hillingdon Draft Local Plan (DMEI 8-11)	London Borough of Hillingdon	Planning guidance document
Hinksey Flood Alleviation Scheme	Network Rail	Project example
Hull Local Plan (Policies 37-41, 43-44)	Hull City Council	Planning guidance document
Huntingdonshire SFRA and associated mapping	Huntingdon District Council	Interactive website
Joint West London SFRA	Joint West London	Interactive website
Lewisham Core Strategy 2011 (Policies 7, 10 and 11)	London Borough of Lewisham	Planning guidance document
Lewisham Gateway	London Borough of Lewisham	Project example
Lincoln Western Growth Corridor	Lincoln City Council & Environment Agency	Project example
Lincolnshire Development Road and Sustainable Drainage Design Approach	Lincolnshire County Council	Flood guidance document

Name	Owner/ client	Tool
Lincolnshire Development Road and Sustainable Drainage Specification and Construction documentation	Lincolnshire County Council	Flood guidance document
Lincolnshire Highways and Flood Authority Governance and Structure	Lincolnshire County Council	
Llanmaes Flood Alleviation Scheme	Vale of Glamorgan Council	Project example
Local Plan (adopted) Policy LP 21	Richmond Council	Planning guidance document
Local Plan (allocated land for a flood alleviation scheme): Policy I7 Phoenix Green Flood Alleviation	Hart District Council	Planning guidance document
Local Plan Core Strategy (adopted) policy CS 24: Flood Risk	Dartford Borough Council	Planning guidance document
Local Plan Core Strategy (adopted) policy PL 2: Flood Risk & PL 9: River Thames and the riverside	Wandsworth Council	Planning guidance document
Local Plan Development Management Policies, DMS 7	Wandsworth Council	Planning guidance document
Local Plan flood risk note for the planning application process	East Riding of Yorkshire Council	Flood guidance document
Manor Fields Park, Sheffield	Sheffield City Council, Sheffield Wildlife Trust, The Green Estate Company, Manor and Castle Development Trust, Yorkshire Water, Robert Bray	Project example

Name	Owner/ client	Tool
	Associates and Bellway Homes	
Medmerry flood management scheme	Environment Agency	Project example
Mount Oswald, Durham	Durham County Council	Project example
New Forest Level 1 and 2 SFRA	New Forest District Council	Flood guidance document
New South Quarter and Wandle Park, Croydon	Croydon Council	Project example
Nine Elms, London South Bank	Southbank Partnership (Wandsworth Council, Lambeth Council, the GLA and local developers)	Project example
North Northamptonshire Joint Planning Unit Core Strategy (Policies, 1, 4, 5, 8, 9, 10 and 19)	North Northamptonshire Joint Planning and Delivery Unit	Planning guidance document
North West Cambridge	Cambridge City Council/ Cambridge University	Project example
North West Cambridge Area Action Plan (AAP)	Cambridge City Council	Planning guidance document
Northamptonshire Flood Toolkit	Northamptonshire County Council	Interactive website
Northwich Area Flood Risk Assessment	Vale Royal Borough Council	Project example

Name	Owner/ client	Tool
Nottinghamshire Level 1 Minerals SFRA	Nottinghamshire County Council	Flood guidance document
Partnership for Urban South Hampshire SFRA	Partnership for Urban South Hampshire	Interactive website
Peterborough SuDS	Peterborough City Council	Interactive website
Planning Application Approval Process for Southwark Council	Southwark Council	Project example
Policy ARNA 1 of the Anglesey and Gwynedd joint Local Development Plan (Coastal change management area)	Isle of Anglesey County Council and Gwynedd Council	Planning guidance document
Renfrewshire SFRA	Renfrewshire Council	Flood guidance document
Rising Brook, Storage Dam and Flood Risk Management Scheme	Rising Brook, Rugeley	Project example
Salford Flood Risk SPD	Salford City Council	Planning guidance document
Scottish Borders Council SFRA	Scottish Borders Council	Flood guidance document
Shawfield SFRA and SWMP	Glasgow City Council (on behalf of South Lanarkshire Council, Clyde Gateway and Scottish Enterprise)	Flood guidance document

Name	Owner/ client	Tool
Sheffield City Council Core Strategy	Sheffield City Council	Planning guidance document
Shoreham Harbour Flood Risk Management Guide SPD	Adur and Worthing Councils	Flood guidance document
Small Scale SuDS Tool	London Borough of Kensington and Chelsea	Interactive website
South Downs Local Plan Policy	South Downs National Park Authority	Planning guidance document
South Downs National Park Authority Level 2 SFRA	South Downs National Park Authority	Flood guidance document
South East England SuDS guidance	Susdrain (multiple LLFAs)	Flood guidance document
South East Lincolnshire SFRA	South East Lincolnshire Joint Strategic Planning Committee	Planning guidance document
South West London SFRA	Sutton, Croydon, Wandsworth and Merton Councils	Planning guidance document
Southampton Coastal Flood and Erosion Risk Management Strategy	Southampton City Council	Flood guidance document
Southampton FRA Template	Southampton City Council	Flood guidance document
Southampton Level 2 SFRA	Southampton City Council	Flood guidance document
Southern Fringe Surface Water Strategy - EA/LPA Protocol and Compliance Checklist	Environment Agency	Flood guidance document

Name	Owner/ client	Tool
Southwark Core Strategy CD88 Strategic Flood Risk Sequential Test	London Borough of Southwark	Planning guidance document
Specter Garden Centre, Decision Notice	The Planning Inspectorate Wales	Planning guidance document
Spelthorne Flooding SPD	Spelthorne Borough Council	Project example
St Andrews Park, Uxbridge	London Borough of Hillingdon, Atkins, Allen Pyke and VSM Estates	Project example
St Austell Bay Resilient Regeneration (STARR) Project	Cornwall Council	Flood guidance document
St Helens Local Plan (Policies LPA09, LPC05-LPC10 and LPC12)	St Helens Council	Planning guidance document
SuDS Decision Support tool for small-scale development	East Sussex County Council	Planning guidance document
Swansea Local Development Plan	City and County of Swansea Council	Planning guidance document
Test Valley SFRA	Test Valley Borough Council	Flood guidance document
The North Glasgow Integrated Water Management System (IWMS): A Review	CREW	R&D
University of York St John student accommodation upstream of Foss Barrier	University of York	Project example
Walk Mills, Keighley	Confidential	Project example

Name	Owner/ client	Tool
Warwick Local Plan (Policies FW1-FW4)	Warwick District Council	Planning guidance document
Waveney Development and Coastal Change SPD	Waveney District Council	Flood guidance document
Waverley Level 2 SFRA	Waverley Borough Council	Flood guidance document
West Wight Coastal Flood and Erosion Risk Management Strategy	Isle of Wight Council	Flood guidance document
Wiltshire Council Groundwater Management Strategy	Wiltshire County Council	Flood guidance document
Wiltshire Level 1 SFRA	Wiltshire County Council	Flood guidance document
Winchester SFRA	Winchester City Council	Flood guidance document
Windsor & Maidenhead Local Policy F1 and SPD	Royal Borough of Windsor and Maidenhead	Planning guidance document
Witton Gilbert Flood Alleviation Scheme	Durham County Council	Project example
Worcestershire Mineral Plan (Technical Document)	Worcestershire County Council	Flood guidance document
Wrexham Local Planning Guidance on Management of Surface Water Generated from New Development	Wrexham County Borough Council	Flood guidance document
York Flood Alleviation Scheme	City of York Council	Project example
Ystrad Barwig Isaf, Decision Notice	The Planning Inspectorate Wales	Planning guidance document

Appendix C: Review of recommendations in FD2610 study (2009)

Core recommendations

Core recommendations from 2009 are presented in the table below. We have reviewed the status of these and made additional comments on whether they have been adequately implemented. Note: The + and – symbols have been used to indicate positive or negative comments. We make further comments on additional improvements.

Recommendations in 2009 study	2019 status	Implementation improvements
Clarify the role (and requirement for) SFRAs in the spatial planning process.	Adequately implemented + SFRAs now routinely produced to inform local development plans. + SFRAs well implemented with respect to sequential and exception tests for fluvial and sea flood risk. - Not all SFRAs lead to development of a specific local flood risk policy.	Examine whether the SFRA is the best vehicle to implement wider NPPF flood policies such as assessing cumulative impact and achieving net gain in flood risk reduction.
DLUHC, the Environment Agency and others should clarify processes and responsibilities for data management and sharing; the Environment Agency should incorporate SFRA outputs into its national mapping.	Adequately implemented + Flood and Water Management Act implementation has clarified responsibilities. + National flood risk data sets improved and easily accessible online. + LLFAs have collated more flood risk data. + Online mapping more widely accessible. + PPG includes list of mapped outputs.	Examine how best to incorporate SFRA data into Environment Agency flood maps.

Recommendations in 2009 study	2019 status	Implementation improvements
	+/- SFRA data can be incorporated into Environment Agency maps but whether level of usage is appropriate requires confirming.	
Use surface water management plan guidance to facilitate sewer and surface water risk assessment within SFRAs.	Adequately implemented + The updated national 'Risk of flooding from surface water' mapping is considered appropriate to use in SFRAs. + Surface water management plan outputs are regularly used in SFRAs. + Drainage and wastewater management plans provide an additional data source to incorporate in SFRAs.	None.
DLUHC and Environment Agency to improve integration of sequential approach in LDP core strategies and sustainability appraisals.	Partially implemented +/- Application of sequential approach process varies between LPAs, for fluvial and sea flood risk it is broadly considered to be implemented except for within flood zone 3 (3a vs 3b). Application for other flood sources is intermittent.	Use revisions to NPPF, PPG and SFRA guidance to clarify application of sequential test to all flood sources and within flood zone 3.
DLUHC and Environment Agency to clarify and communicate parameters for safe development. SFRAs should include local 'what is safe' recommendations.	Partially implemented + PPG (Paragraphs 038 to 042, 054 to 060) sets out what needs to be considered to demonstrate that a development will be safe, to satisfy the second part of the exception test.	Consider adding a bullet point in PPG Paragraph 010 to include 'identify requirements for safe development'. Consider defining under what conditions a SPD is

Recommendations in 2009 study	2019 status	Implementation improvements
	- A list of local criteria for safe development is sometimes found in an SFRA, particularly in areas of high fluvial or sea flooding. However, this is not consistently found in SFRAs.	required by LPAs to provide further detail on what constitutes safe development.
All future SFRA studies should include a communications plan between LPA departments and with interested groups.	Minimal implementation - There is no formal requirement for a communication plan. Effective and timely communication still relies on good working partnerships within LPAs and with external interested groups.	Build on established flood risk forums/partnerships to encourage closer and earlier discussion between LPAs, LLFAs and the Environment Agency to plan in advance for future SFRA work.

Supplementary recommendations

Recommendations in 2009 study	2019 status	Implementation improvements
LPAs and consultants should make sure SFRAs and other studies contain an accessible data register to maximise benefit of existing data.	Partially implemented +/- No specific requirement. In general, the quality of SFRAs and associated data management is considered to have improved.	None.
DLUHC and Environment Agency should clarify definition of functional flood plain for all flood	Minimal implementation + Some LPAs are choosing to define areas of surface water flood risk as flood zone 3a.	Clarify definition of flood zone 3a and 3b including for surface water flood risk. Provide guidance and

Recommendations in 2009 study	2019 status	Implementation improvements
sources, particularly surface water.	- There is no comprehensive or consistent approach across LPAs. - No national approach has been produced.	examples on how to do this.
SFRAs should state their definition of functional flood plain. Further policy and process work is required on safeguarding functional flood plains/flow routes for all sources.	Partially implemented + Generally the need to safeguard areas of fluvial functional flood plain is well understood. - Further work still needed on safeguarding active flow routes for all sources.	Clarify definition of flood zone 3a and 3b including for surface water flood risk. Provide guidance and examples on how to do this.
DLUHC should provide further guidance on incorporating climate change into SFRAs.	Partially implemented + Climate change allowances guidance updated and regularly maintained by Environment Agency for fluvial, sea and surface water. - No guidance available for groundwater and reservoir flood risk.	Future climate change allowance guidance should include how it should be applied to for groundwater and reservoir flood risk.
Guidance should be issued on assessing and mitigating residual risk and on risk to life, for example, emergency planning and water depth thresholds.	Adequately implemented + Defra-Environment Agency publications FD2320 and FD2321 still considered useful guidance, albeit large technical documents.	Consider extracting key diagrams/info into shorter standalone guidance.
Best practice examples of SFRA mapping and	Partially implemented Ad hoc approach, mostly at a local level and by word of mouth.	Promote examples via 2020 UFRISP research.

Recommendations in 2009 study	2019 status	Implementation improvements
reporting should be provided.		
Provide further guidance to LPAs on how sequential test should be applied to more detailed SFRA outputs and within flood zones 3a & 3b.	Partially implemented - PPG only states that the sequential test should be applied considering all sources. No further guidance on how is provided.	Consider providing more guidance on how to rank sites at risk of flooding from all sources, so sequential test can be applied.
Future SFRAs should provide a clear hierarchical approach to collecting and using data for assessing flood risk for all flood sources.	Partially implemented + Examples of online mapping enable users to view multiple layers of flood risk data simultaneously. - Online mapping is not adopted by all LPAs for their SFRAs.	None.
Further guidance with case studies should be issued on aligning data sets with the Avoid, Substitute, Control and Mitigate flood risk management hierarchy.	Partially implemented Ad hoc approach, mostly at a local level and by word of mouth.	Promote examples via UFRISP research.
LPAs should make SFRAs available online to interested groups and developers.	Adequately implemented - Widely available online, but not comprehensively, however this should be addressed as LPAs progress through their next local development plan cycle.	None.
DLUHC should consider developing	Partially implemented	Depends if the trigger is planning

Recommendations in 2009 study	2019 status	Implementation improvements
guidance on triggers/timescales for updating SFRAs.	- No explicit guidance available except to tie in with the local development plan cycle. + Triggers and timelines often identified by authors of SFRAs and noted in the documents themselves.	related or more LLFA-focused NPPF/PPG policies such as net benefit or cumulative assessment.
There should be regular meetings between LPAs, LLFAs, Environment Agency and other interested groups on current and future flood risk issues and SFRA implications.	Partially implemented -/+ Varies from area to area. - Evidence suggests it is happening but not as early or regularly as required to optimise the commissioning phase of a SFRA.	Build on established flood risk forums/partnerships to encourage closer and earlier discussion between LPAs, LLFAs and Environment Agency to plan in advance for future SFRA work.
LPAs should use the SFRA process to identify if and how a flood risk or water management SPD is needed and consult the Environment Agency on this.	Partially implemented -/+ Varies from area to area.	Discuss whether there should be criteria in the PPG to define when SPGs are expected.
A national set of indicators should be established to demonstrate flood management performance.	Adequately implemented + Not explicitly addressed to date, however major performance issues can be reflected in the Environment Agency-Defra National Strategy reporting process.	None.

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