West Sussex County Council

Local Flood Risk Management Strategy

Strategic Environmental Assessment: Environmental Report: Appendix C - Assessment of the draft LFRMS Measures and Actions

001
February 2025

Public

West Sussex County Council

Local Flood Risk Management Strategy

Strategic Environmental Assessment: Environmental Report: Appendix C - Assessment of the draft LFRMS Measures and Actions

Type of document (version) Public

Project no. 70123384

Our Ref. No. 001

Date: February 2025

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Quality control

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Draft for Consultation			
Date	February 2025			
Prepared by	IE			
Checked by	CT			
Authorised by	AP			
Project number	70123384			
Report number	001			

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Introduction

1.1.1. The assessment of Measures and Actions has been grouped by Objective and Measures and are shown in **Table C-2** to **Table C-12**, below.

1.1.2. **Table C-1** below shows the key to effects that have been used within the assessments below. It should be noted that where uncertain and neutral effects have been identified, it has not been possible to determine the nature of effect, the spatial extent, the reversibility or the duration of effect. In this instance, these cells have been left blank.

Table C-1 - Key to Effects

Effect Significance	Key
Potential for significant positive effects	++
Potential for minor positive effects	+
Potential for minor negative effects	-
Potential for significant negative effects	--
Potential for both positive and negative effects	+/-
Uncertain effects	?
Negligible / No effect	0
Nature of effect (direct / indirect)	D / I
Spatial extent (local / regional / national / international)	L / R / N / I
Reversibility of effect (reversible / irreversible)	R / I
Duration (short / medium / long term)	ST / MT / LT

1.1.3. Measures and Actions have been grouped as follows:

Table C-2 - LFRMS Measures and Actions

Objective 1

Measure	Action
1.1 - Establish a clear understanding of flood risk across West Sussex by catchment	1.1.1 - Refine a process to maintain historic flood risk data register in a mapping platform, looking at all flood sources
	1.1.2 - Develop catchment management plans for each catchment, delivery to be prioritised by action 1.2.3
	1.1.3 - Maintain a central point of collaboration between river trusts and partnerships.
1.2 - Utilise the best available data to prioritise flood risk management schemes	1.2.1- Review and analyse all data received as part of the public engagement survey, including GIS mapping.
	1.2.2 - Use all available data and a consistent risk driven approach for each catchment to identify priority areas.
	1.2.3 - Subject to funding, undertake local studies and assessments and generate new flood risk data to support strategic decision making.
	1.2.4 - Where suitable locations are identified, develop business cases to support funding of improvement schemes.
	1.2.5 – Conclude work on projects to reduce flood risk in Angmering, Parklands (West of Chichester), and Hassocks
1.3 - Develop collaborative opportunities for sharing data	1.3.1 - Establish a ‘report my flood’ system in addition to the system for reporting highway flooding, for local communities and partners.
	1.3.2 - Hold flood meetings twice a year, to be attended by all RMAs to encourage collaboration across partnerships.
	1.3.3 - Develop a programme tracker for all ongoing or planned flood risk management projects across all RMAs in West Sussex.

Objective 2

Measure	Action
2.1 - Promote a consistent approach across local planning authorities	2.1.1 - Review and update standard flooding and drainage guidance and advice for developers
	2.1.2 - Provide SuDS and drainage training for planning officers and local members
	2.1.3 - Promote the chargeable pre-application service on sustainable drainage and local flood risk management for new development proposals
	2.1.4 - Produce standard conditions on flooding and drainage for all planning authorities, including consideration of drainage implications within minor development
2.2 - Align and integrate with Local Nature Recovery strategies and biodiversity projects to maximise delivery of co-benefits	2.2.1 - Engage with WSCC services and partner organisations to establish synergies and opportunities for nature recovery by collating ongoing projects and strategies.
	2.2.2 - Promote the wider biodiversity benefits from SuDS and nature based-flood alleviation with updated online resources signposting to best practice and information shares at stakeholder meetings.

Objective 3

Measure	Action
3.1 Improve collaboration with partners in asset management	3.1.1 – Consolidate partnership working via a formalised collaboration agreement or MOU.
	3.1.2 - Working with partners, consolidate a spatial mapping application to map flood risk management assets across the county.
	3.1.3 - Engage relevant stakeholders in asset management conversations to encourage consistent record keeping.
3.2 – Improve how we manage existing assets	3.2.1 - Complete digitisation of highway asset data.
	3.2.2 - Adopt EA T98 condition grading system for inspecting assets affecting local flood risk (e.g. ditches, culverts and outfalls).
	3.2.3 – Agree methodology for defining priority assets, and undertake and record inspections of those assets, once identified.
	3.2.4 - Following the completion of 3.1.2 undertake gap analysis to identify missing or poor-quality asset data.
	3.2.5 - Implement programme of remedial or risk management projects for relevant high-risk assets, where cost-benefit justification exists.
	3.2.6 - Explore the feasibility of smart sensor implementation across WSCC highways and FCERM drainage assets and undertake initial pilot project(s).
3.3 - Support the implementation of Nature Based Solutions	3.2.1 - Educate communities and stakeholders on the benefits of nature-based solutions through online resources and in person meetings
	3.2.2 - Review and document barriers to implementation of nature-based solutions
	3.2.3 - Signpost and consolidate national and county-scale best practice nature-based solutions projects

Objective 4

Measure	Action
4.1 - Create mechanisms for communities to influence flood risk management	4.1.1 - Identify the significant landowners, community groups, stakeholders by catchment
	4.1.2 - Engage with identified landowners regarding riparian watercourse management responsibilities, requirement for watercourse consents and best practice agricultural land management to influence surface water runoff.
	4.1.3 - Continue focused enforcement by Riparian Drainage Project Officers of riparian asset owners to ensure watercourses which are contributing to highway flooding are maintained.
	4.1.4 - Develop a flooding toolbox with guidance and communication material for Parish Councils
	4.1.5 - Promote and advocate for community flood wardens in ‘at-risk’ communities, through coordinated engagement activities such as Parish Council Meetings
	4.1.6 - Continued promotion and collaboration of Operation Watershed to deliver community-led flood projects
4.2 - Improve understanding and adoption of flood preparedness at a community scale	4.2.1 - Signpost guidance for community-level preparedness in vulnerable areas, including property level resilience on WSCC website and community hubs
	4.2.2 - Attend community events via collaboration with WSCC Engagement and Communities teams and encourage attendance of RMAs
	4.2.3 - Collaborate with schools to develop awareness around flood risk through STEM events
	4.2.4 - Implement learning outcomes from the Rapid Adaptation Pathway Assessment pilot study for better adaptation planning

Objective 1

Measure 1.1

Table C-3 - Assessment of Measure 1.1 and Actions

Objective	Objective 1: Use a catchment-based approach to understand and manage flood risk.
Measure	1.1 - Establish a clear understanding of flood risk across West Sussex by catchment
Actions	1.1.1 - Refine a process to maintain historic flood risk data register in a mapping platform, looking at all flood sources. 1.1.2 - Develop catchment management plans for each catchment, delivery to be prioritised by action 1.2.3 1.1.3 - Maintain a central point of collaboration between river trusts and partnerships.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA1: Population, Equalities & Human Health	+	L	I	R	R	T	LT	A digitised mapping platform that holds data on historic flooding and flood sources in West Sussex may indirectly benefit the regional population through the improved knowledge of flood risk. With increased knowledge on historic flood risk at catchment level, it is anticipated that this may result in improvements when predicting future flood risk and mitigating against effects on future communities. However, it is unclear how the river trusts will work with partners on the LFRMS.
SEA2: Economy	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA3: Biodiversity	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA4: Landscape and Townscape	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA5: Historic Environment	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA6: Water Environment	+	L	D	R	R	T	LT	This measure is likely to result in minor positive effects for the water environment by implementing catchment management plans. This could identify areas with higher surface runoff and lead to improvements which reduce the amount of pollutants entering water bodies, improving the water quality.
SEA7: Flood Risk	+	M	D	R	R	P	LT	The development of a record of historic flooding and sources of flood risk is likely to result in improvements to flood risk resilience within West Sussex. Knowledge of past flood events is likely to inform predictions of areas susceptible to future flooding and lead to improved risk assessment and decision making, reducing flood risk within West Sussex.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA8: Climatic Factors	+	L	I	R	R	P/T	LT	This measure could result in minor positive effects by indirectly improving the resilience of assets and infrastructure to climate change through a mapping platform. Increased knowledge of historic flooding and sources of floods at catchment scale may improve the potential to predict future flood risk and mitigating against the effects. Catchment management plans would also consider the effect of climate change which could lead to solutions to mitigate the effects.
SEA9: Material Assets	+	M	D	R	R	P	LT	The South Downs National Park Authority is a partner of the LFRMS and this data could indirectly have positive impacts if shared with this partner. The South Downs National Park covers the majority of catchments in the LFRMS and the flood mapping could identify flood sources and areas frequently flooded. Increased knowledge of these areas could lead to future mitigation against soil erosion in the park and surrounding farmland.

Potential Cumulative / Synergistic Effects	**SEA1:** Potential for positive cumulative effects arising from improved food risk mitigation and community engagement, reducing effects of flooding on communities and reducing stress. **SEA7:** Potential for positive cumulative effects arising from improved decision making and reduced flood risk in West Sussex. **SEA8:** Potential for positive cumulative effects arising from improved flood risk mitigation, reducing effects of climate change on transport and critical infrastructure. **SEA9:** Potential for positive cumulative effects arising from improved flood risk mitigation, reducing effects of flooding in West Sussex.
Mitigation and Enhancement Measures	No mitigation or enhancement measures identified
Recommendations	The LFRMS could be expanded to include the following stakeholders: local and regional transport bodies.

Measure 1.2

Table C-4 - Assessment of Measure 1.2 and Actions

Objective	Objective 1: Use a catchment-based approach to understand and manage flood risk.
Measure	1.2 - Utilise the best available data to prioritise flood risk management schemes
Actions	1.2.1- Review and analyse all data received as part of the public engagement survey, including GIS mapping. 1.2.2 - Use all available data and a consistent risk driven approach for each catchment to identify priority areas. 1.2.3 - Subject to funding, undertake local studies and assessments and generate new flood risk data to support strategic decision making. 1.2.4 - Where suitable locations are identified, develop business cases to support funding of improvement schemes. 1.2.5 - Conclude work on projects to reduce flood risk in Angmering, Parklands (West of Chichester), and Hassocks.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA1: Population, Equalities & Human Health	+	M	I	R	R	P	LT	The development of all available data and generating new data, will identify higher risk flood locations and may indirectly benefit the population through the improved knowledge of regional flood risk. Utilising public engagement survey data will help to improve knowledge and awareness and reduce stress caused by flooding. With increased flood risk knowledge it is anticipated that this may result in improvements when predicting future flood risk and mitigating against the effects. Completion of projects undertaken to reduce flooding in Angmering, Parklands and Hassocks will also reduce the effects on future communities.
SEA2: Economy	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA3: Biodiversity	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA4: Landscape and Townscape	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA5: Historic Environment	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA6: Water Environment	+	M	I	R	R	P	LT	Identification of priority areas and completion of projects to reduce flooding could improve water management, reducing surface runoff within West Sussex. This would likely reduce the amount of pollutants entering water bodies, improving the water quality.
SEA7: Flood Risk	+	M	D	R	R	P	LT	Completion of projects to reduce flooding will therefore reduce flood risk. The use of all available data and generating new data to inform on high priority areas in each catchment is likely to result in improvements to flood risk management within West Sussex. Knowledge of past flood events is likely to inform predictions of future flood risk and lead to improved decision making, reducing flood risk.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA8: Climatic Factors	+	L	I	R	R	P	LT	The use of all available data to identify higher areas of flood risk may indirectly increase the resilience of transport and critical infrastructure against the effects of climate change. Increased knowledge on historic and new flood risk data is anticipated to result in improvements when predicting future flood risk and mitigating against the effects of climate change.
SEA9: Material Assets	+	L	I	R	R	P	LT	This measure could have minor positive effects on material assets through using all available data to identify higher flood risk locations. Improved river management could indirectly improve soils across the region.

Potential Cumulative / Synergistic Effects	**SEA1:** Potential for positive cumulative effects arising from improved food risk mitigation, reducing effects of flooding on communities. **SEA6:** Potential positive cumulative effects as a result of improved flood risk resilience and improved water quality. **SEA7:** Potential for positive cumulative effects arising from improved decision making and reduced flood risk. **SEA8:** Potential for positive cumulative effects arising from improved flood risk mitigation, reducing effects climate change effects on transport and critical infrastructure. **SEA9:** Potential for positive cumulative effects arising from improved flood risk mitigation, reducing effects on material assets.
Mitigation and Enhancement Measures	No mitigation or enhancement measures have been identified for this measure.
Recommendations	No recommendations have been identified for this measure.

Measure 1.3

Table C-5 - Assessment of Measure 1.3 and Actions

Objective	Objective 1: Use a catchment-based approach to understand and manage flood risk.
Measure	1.3 - Develop collaborative opportunities for sharing data
Actions	1.3.1 - Establish a 'report my flood' system in addition to the system for reporting highway flooding, for local communities and partners. 1.3.2 - Hold flood meetings twice a year, to be attended by all RMAs to encourage collaboration across partnerships. 1.3.3 - Develop a programme tracker for all ongoing or planned flood risk management projects across all RMAs in West Sussex.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA1: Population, Equalities & Human Health	+	M	D	R	R	T	LT	This measure is anticipated to have minor positive effects on population and human health. Implementing a reporting system may indirectly benefit the regional population by improving knowledge of flood risk to communities and partners. Flood meetings with communities and partners is anticipated to enhance community engagement and reduce the levels of distress caused by flooding. There is also potential that this may reduce inequalities in terms of flooding exposure, ensuring that communities and residents most at risk are considered within the LFRMS and any arising actions.
SEA2: Economy	+	M	D	R	R	T	LT	Minor positive effects are anticipated for the economy as it is likely that sharing data and collaboration will provide an increased understanding of flooding, resulting in improved flood risk resilience, and reducing economic damage in the long term.
SEA3: Biodiversity	+	M	D	R	R	P	LT	The South Downs National Park Authority and South East Coastal Group are both key partners to the LFRMS, subsequently there are anticipated improvements from data sharing and a programme tracker for projects to aid flood resilience measures. Indirectly, there is potential for this to benefit biodiversity within the South Downs and along the shoreline. However, it is currently uncertain whether the partners will implement measures that benefit biodiversity.
SEA4: Landscape and Townscape	+	M	D	R	R	P	LT	The South Downs National Park Authority and South East Coastal Group are included as a key Partner to the LFRMS. Therefore, communicating to this partner has potential to result in improvements to the landscape across the region, as partners may focus on improving flood risk resilience within the landscape, subsequently preventing flood damage.
SEA5: Historic Environment	?	N/A	N/A	N/A	N/A	N/A	N/A	Uncertain effects have been identified for the historic environment as none of the heritage managers/organisations within West Sussex are included as partners or stakeholders within the LFRMS. It is therefore uncertain if data sharing will benefit any heritage assets located within the region. Sharing information with these additional stakeholders may improve flood risk resilience and reduce the likelihood of damage to assets.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA6: Water Environment	+	M	D	R	R	P	LT	The Environment Agency, Southern Water and Thames Water are partners of the LFRMS. Promoting collaboration through flood meetings and data sharing has potential to increase flood risk resilience between these partners and may result in improved measures to manage sewer flooding, drainage, sewage outfall, groundwater and surface runoff during flood events and minimise subsequent pollution to regional water bodies.
SEA7: Flood Risk	+	M	D	R	R	P	LT	Minor positive effects are anticipated for flood risk as a result of this measure. Programme trackers for projects will help to create a joined up approach across the county and RMA flood meetings will encourage shared knowledge to influence the development of physical flood risk resilience measures, both actions helping reduce the effects of flooding across the region.
SEA8: Climatic Factors	+	M	D	R	R	P	LT	Minor positive effects have been identified for this measure. It is anticipated that a system reporting highway floods and data sharing will benefit the transport and infrastructure assets and increase resilience to climate change within the region.
SEA9: Material Assets	+	M	D	R	R	P	LT	The South Downs National Park Authority are included as a key Partner to the LFRMS. Communicating to this partner through a flood system has potential to result in improvements to soil quality and drainage within the parks, increasing resilience against climate change.

Potential Cumulative / Synergistic Effects	**SEA1:** Potential positive cumulative effects as a result of reduced distress, flood risk inequalities, and improved community engagement. **SEA2:** Potential positive cumulative effects as a result of reduced economic damage. **SEA3/SEA4/SEA6/SEA7/SEA8/SEA9:** Potential positive cumulative effects as a result of improved flood risk resilience. **SEA7:** Potential positive cumulative effects as a result of reduced flood risk within West Sussex.
Mitigation and Enhancement Measures	**SEA1:** Communication should not be limited to an online flood system. Measures should ensure that all groups can report a flood and in a timely manner. Consideration should be given to those who may not have access or the knowledge to access the internet and/or a smart phone.
Recommendations	The LFRMS could be expanded to include the following stakeholders: Managing organisations of heritage assets and local and regional transport bodies. Alternative methods could be explored to allow non computer users to report a flood in their community. The flood reporting system could also consider expanding to include both social media and phone/text alerts for flood events and possibly extend warnings to transport network providers.

Objective 2

Measure 2.1

Table C-6 - Assessment of Measure 2.1 and Actions

Objective	Objective 2: Create a common, informed framework for sustainable development that improves safety and resilience for people, property, infrastructure, and the environment through long-term thinking.
Measure	2.1 - Promote a consistent approach across local planning authorities
Actions	2.1.1 - Review and update standard flooding drainage guidance and advice for developers. 2.1.2 - Provide SuDS and drainage training for planning officers and local members. 2.1.3 - Promote the chargeable pre-application service on sustainable drainage and local flood risk management for new development proposals. 2.1.4 - Produce standard conditions on flooding and drainage for all planning authorities, including consideration of drainage implications within minor development.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA1: Population, Equalities & Human Health	+	M	D	R	R	P	LT	This measure is anticipated to have minor positive effects through the application of drainage guidance and advice for developers. This is likely to result in new housing developments having higher flood resilience from improved drainage. However, this is dependent on the implementation of drainage and SuDS in proximity to residential areas in the region.
SEA2: Economy	+	M	D	R	R	P	LT	Minor positive effects are anticipated for this measure. Business developers using drainage guidance and advice is likely to result in developments having higher flood resilience from improved drainage measures. Therefore, any new business developments will be more resilient.
SEA3: Biodiversity	?	N/A	N/A	N/A	N/A	N/A	N/A	This measure has uncertain effects. Providing SuDS within developments has potential to improve biodiversity and the ecological value of developments. However, this is dependent on the implementation from developers to determine the scale of this effect.
SEA4: Landscape and Townscape	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA5: Historic Environment	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA6: Water Environment	+	M	D	R	I	P	LT	This measure is anticipated to result in positive effects for the water environment. Standardised guidance for developers and production of standard conditions across the region of West Sussex has potential for this measure to result in improved flood resilience. SuDS and drainage training could increase implementation of SuDS. Increased utilisation of SuDS would result in controlled runoff of surface water during flood and heavy rainfall events. This is likely to positively affect water quality through controlled storage and release of water, reducing the quantity of pollutants washed into water bodies during rainfall and flood events.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA7: Flood Risk	+	M	D	R	I	P	LT	Standardised guidance for developers and production of standard conditions across the region of West Sussex has potential for this measure to result in reduced flood risk and improved flood resilience. SuDS and drainage training could increase the implementation of SuDS. Increased utilisation of SuDS would result in controlled runoff of surface water during flood and heavy rainfall events. This contributes to reducing the risk of flooding in areas where SuDS are present.
SEA8: Climatic Factors	+	M	D	R	R	P	LT	There is potential for this measure to result in improvements to climate change resilience within critical infrastructure by applying SuDS as well as guidance and standard conditions within development designs.
SEA9: Material Assets	+	M	D	R	I	P	LT	There is potential for this measure to result in improvements to material assets such as drainage in soils by applying SuDS alongside guidance and standard conditions on flood and drainage.

Potential Cumulative / Synergistic Effects	**SEA1:** Potential positive cumulative effects upon population and human health through flood resilience and improved drainage. **SEA2:** Potential positive cumulative effects upon economy through flood resilience and improved drainage. **SEA6:** Potential positive cumulative effects upon water quality through reduced surface runoff and pollutants. **SEA7:** Potential positive cumulative effects upon flood risk through improved drainage and flood risk mitigation methods. **SEA8:** Potential positive cumulative effects upon effects of climate change resilience on transport and critical infrastructure through improved drainage and sustainable developments. **SEA9:** Potential positive cumulative effects upon material assets through improved drainage and use of sustainable materials.
Mitigation and Enhancement Measures	**SEA3:** Opportunity to promote used of SuDS in standard drainage guidance to work with natural processes to manage flood risk and enhance biodiversity and ecosystem resilience through habitat creation, green engineering and natural management techniques. **SEA4/SEA5:** Measures should incorporate Construction Industry Research and Information Association's (CIRIA) guidance on SuDS design[1] to ensure high-quality design that will minimise the effects on the historic environment. **SEA4/SEA5:** A consistent approach should be applied to developments as they should be well-designed and screened to ensure that their effects on the townscape, landscape and historic setting are minimised. **SEA6:** Care should be taken during construction regarding the potential for contaminants such as silt, concrete or fuel oil to pollute water courses via surface run off. All construction activities should be undertaken in accordance with relevant best practice pollution prevention guidance. Pollution Incident Control Management Plans should be developed to limit adverse effects arising from pollution events. **SEA6:** Dependent on the nature of proposed flood risk schemes, natural hydromorphological functions could be impacted, resulting in negative effects.
Recommendations	No recommendations have been identified for this measure.

[1] Construction Industry Research and Information Association's (CIRIA) Guidance on the construction of SuDS (C768). 2017. Illman, S, Wilson, S.

Measure 2.2

Table C-7 - Assessment of Measure 2.2 and Actions

Objective	Objective 2: Create a common, informed framework for sustainable development that improves safety and resilience for people, property, infrastructure, and the environment through long-term thinking.
Measure	2.2 - Align and integrate with Local Nature Recovery strategies and biodiversity projects to maximise delivery of co-benefits
Actions	2.2.1 - Engage with WSCC services and partner organisations to establish synergies and opportunities for nature recovery by collating ongoing projects and strategies. 2.2.2 - Promote the wider biodiversity benefits from SuDS and nature based-flood alleviation with updated online resources signposting to best practice and information shares at stakeholder meetings.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA1: Population, Equalities & Human Health	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA2: Economy	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA3: Biodiversity	++	H	D	R	R	P	LT	The South Downs National Park Authority, South East Coastal Group and the Environment Agency are key partners to the LFRMS, engaging in ongoing projects and improving opportunities for nature recovery is likely to result in significant positive enhancement of biodiversity across West Sussex. This may also result in improved opportunities for biodiversity net gain within developments arising from the LFRMS. Improving biodiversity is likely to result in enhanced habitats within the region, providing opportunities for species and ecological networks. There is potential that the implementation of SuDS and nature based flood alleviation may include measures that also benefit biodiversity.
SEA4: Landscape and Townscape	+	M	D/I	R	R	P	LT	Improvements to biodiversity is likely to result in indirect enhancements across the West Sussex regional natural landscape. Additionally, providing opportunities for urban greening is likely to enhance the visual amenity and landscape setting.
SEA5: Historic Environment	+	M	I	R	R	P	LT	Indirectly, it is anticipated that improving biodiversity, ecosystem services and urban greening is likely to benefit heritage assets through the enhancement of their settings, improving the natural environment surrounding heritage assets.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA6: Water Environment	++	H	D	R	I	P	LT	This measure is anticipated to result in significant positive effects for the water environment. Utilising SuDS and nature based flood alleviation is likely to result in controlled and reduced surface water runoff during flood and heavy rainfall events. Nature recovery may also improve the water environment through reconnection of wetlands to rivers. Both actions are likely to positively affect water quality through controlled storage and release of water, reducing the quantity of pollutants washed into West Sussex's water bodies during rainfall and flood events, improving water quality.
SEA7: Flood Risk	++	H	D	R	I	P	LT	Improving biodiversity and implementation of SuDS is likely to result in significant positive effects upon flood risk resilience. Increased planting results in improved drainage within soils and increased absorption of waters. Therefore, it is anticipated that this will reduce surface standing water during rainfall and flood events, resulting in significant positive effects.
SEA8: Climatic Factors	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA9: Material Assets	+	L	I	R	R	P	LT	Minor positive effects have been identified for material assets as a result of this measure. Improving biodiversity will help to enhance the function of soils, with both plants and species contributing to improved drainage and reduced soil erosion. This will allow controlled surface water runoff during heavy rainfall and flood events, increasing flood resilience. However, this measure does not consider waste, infrastructure or agricultural land.

Potential Cumulative / Synergistic Effects	**SEA3:** Potential positive cumulative effects arising from increased biodiversity and ecosystem services. **SEA4:** Potential positive cumulative effects arising from improved green spaces and landscape setting. **SEA5:** Potential positive cumulative effects upon the setting of heritage assets. **SEA6:** Potential positive cumulative effects on water quality through reduced surface runoff. **SEA7:** Potential positive cumulative effects upon flood risk through improved flood risk resilience and improved drainage. **SEA9:** Potential positive cumulative effects upon soils through improved drainage and reduced erosion.
Mitigation and Enhancement Measures	**SEA1:** New developments should present opportunities for new areas of green infrastructure and green space which can be accessed by the community. **SEA3:** Biodiversity targets should exceed mandatory biodiversity net gain of 10% where possible. **SEA3:** Biodiversity measures that are implemented should aim to contribute to reducing flood risk where possible, with improved tree planting for drainage measures.
Recommendations	No recommendations have been identified for this measure.

Measure 3.1

Table C-8 - Assessment of Measure 3.1 and Actions

Objective	Objective 3: Adopt collaborative approaches to understanding and managing flood risk assets and systems, prioritising the implementation of nature-based solutions.
Measure	3.1 - Improve collaboration with partners in asset management
Actions	3.1.1 – Consolidate partnership working via a formalised collaboration agreement or MOU. 3.1.2 - Working with partners, consolidate a spatial mapping application to map flood risk management assets across the county. 3.1.3 - Engage relevant stakeholders in asset management conversations to encourage consistent record keeping.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA1: Population, Equalities & Human Health	+	M	D	R	R	P/T	LT	The development of a spatial mapping application to aid flood risk management in West Sussex may indirectly benefit the regional population through the improved knowledge of flood risk. With increased asset knowledge it is anticipated that this may result in improvements when predicting future flood risk and mitigating against the effects and could reduce the levels of distress caused by flooding.
SEA2: Economy	+	L	D/I	R	R	P/T	LT	Minor positive effects are anticipated for the economy as it is likely that mapping assets and partnership collaboration will provide an increased understanding of flooding, resulting in improved flood risk resilience, and reducing economic damage in the long term.
SEA3: Biodiversity	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA4: Landscape and Townscape	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA5: Historic Environment	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA6: Water Environment	+	M	D	R	R	P	LT	The Environment Agency and South East Coastal Group are partners of the LFRMS. Promoting collaboration and consolidate spatial mapping could improve resilience and reduce surface runoff during flood events and minimise subsequent pollution to regional and coastal water bodies.
SEA7: Flood Risk	++	H	D	R	R	P	LT	Significant positive effects are anticipated for this measure. The use of a spatial mapping application is likely to result in improved flood risk by identifying missing or poor quality asset data which could inform predictions of future flood risk and lead to improved decision making within West Sussex.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA8: Climatic Factors	+	M	D	R	R	P	LT	Minor positive effects are likely with spatial mapping and consistent record keeping. With increased flood risk knowledge, it is anticipated that this could result in improvements when predicting future flood risk and mitigating against the effects of climate change.
SEA9: Material Assets	+	M	D	R	R	P	LT	This measure is anticipated to minor positive effects on material assets. Engaging with stakeholders in asset management could improve soil drainage across the South Downs National Park and surrounding agricultural land.

Potential Cumulative / Synergistic Effects	**SEA1:** Potential for positive cumulative effects arising from improved food risk mitigation, reducing effects of flooding on communities and increasing flood mitigation. **SEA2:** Potential positive cumulative effects as a result of reduced economic damage. **SEA6:** Potential positive cumulative effects upon water quality through increased flood resilience and reduced pollutants entering the water course. **SEA7:** Potential for positive cumulative effects arising from improved decision making and reduced flood risk. **SEA8:** Potential for positive cumulative effects arising from improved flood risk mitigation, reducing effects of climate change on transport and critical infrastructure. **SEA9:** Potential for positive cumulative effects arising from improved flood risk resilience.
Mitigation and Enhancement Measures	No mitigation or enhancement measures have been identified for this measure.
Recommendations	The LFRMS could be expanded to include the following stakeholders: local and regional transport bodies.

Measure 3.2

Table C-9 - Assessment of Measure 3.2 and Actions

Objective	Objective 3: Adopt collaborative approaches to understanding and managing flood risk assets and systems, prioritising the implementation of nature-based solutions.
Measure	3.2 - Improve how we manage existing assets
Actions	3.2.1 - Complete digitisation of highway asset data. 3.2.2 - Adopt EA T98 condition grading system for inspecting assets affecting local flood risk (e.g. ditches, culverts and outfalls). 3.2.3 – Agree methodology for defining priority assets, and undertake and record inspections of those assets, once identified. 3.2.4 - Following the completion of 3.1.2 undertake gap analysis to identify missing or poor-quality asset data. 3.2.5 - Implement programme of remedial or risk management projects for relevant high-risk assets, where cost-benefit justification exists. 3.2.6 - Explore the feasibility of smart sensor implementation across WSCC highways and FCERM drainage assets and undertake initial pilot project(s).

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA1: Population, Equalities & Human Health	+	M	D	R	R	P/T	LT	The development of a directory holding asset data and a spatial mapping application and gap analysis to aid flood risk management in West Sussex may indirectly benefit the regional population through the improved knowledge of flood risk. With increased asset knowledge it is anticipated that this may result in improvements when predicting future flood risk and mitigating against the effects and could reduce the levels of distress caused by flooding.
SEA2: Economy	+	L	D/I	R	R	P/T	LT	Minor positive effects are anticipated for the economy as it is likely that sharing asset data and collaboration will provide an increased understanding of flooding, resulting in improved flood risk resilience, and reducing economic damage in the long term.
SEA3: Biodiversity	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA4: Landscape and Townscape	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA5: Historic Environment	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA6: Water Environment	++	M	D	R	R	P	LT	The Environment Agency and South East Coastal Group are partners of the LFRMS. Promoting collaboration through the implementation of FCERM for drainage assets has the potential to increase flood risk resilience and may result in improved measures to coastal flooding, manage sewer flooding, drainage, groundwater and surface runoff during flood events and minimise subsequent pollution to regional and coastal water bodies.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA7: Flood Risk	++	H	D	R	R	P	LT	Significant positive effects are anticipated for this measure. The use of an asset directory grading system for flood risk and identification of high risk assets to inform risk assessments is likely to result in improved flood risk management within West Sussex. Remedial projects have the potential to improve existing flood risk assets, reducing flood risk. A mapping application to identify missing or poor quality asset data is likely to inform predictions of future flood risk and lead to improved decision making, reducing flood risk.
SEA8: Climatic Factors	+	M	D	R	R	P	LT	Minor positive effects are likely if smart sensors on highways are implemented alongside poor quality assets identified near transport infrastructure. With increased flood risk knowledge, it is anticipated that this could result in improvements when predicting future flood risk and mitigating against the effects of climate change of. However, there are currently no traffic and transport stakeholders in the LFRMS. I
SEA9: Material Assets	+/-	M	D	R	R	P	LT	This measure is anticipated to have both positive and negative effects on material assets. Locating areas suitable to develop cases for funding assets will increase the resilience of flood protection. However, there is no specification of what type of assets will be developed and where they may be located. If placed poorly this could have negative impacts on the South Downs National Park affecting soils or agricultural land.

Potential Cumulative / Synergistic Effects	**SEA1:** Potential for positive cumulative effects arising from improved food risk mitigation, reducing effects of flooding on communities and increasing flood mitigation. **SEA2:** Potential positive cumulative effects as a result of reduced economic damage. **SEA6:** Potential positive cumulative effects upon water quality through increased flood resilience and reduced pollutants entering the water course. **SEA7:** Potential for positive cumulative effects arising from improved decision making and reduced flood risk. **SEA8:** Potential for positive cumulative effects arising from improved flood risk mitigation, reducing effects of climate change on transport and critical infrastructure. **SEA9:** Potential for positive cumulative effects arising from improved flood risk resilience.
Mitigation and Enhancement Measures	No mitigation or enhancement measures have been identified for this measure.
Recommendations	The LFRMS could be expanded to include the following stakeholders: local and regional transport bodies.

Measure 3.3

Table C-10 - Assessment of Measure 3.3 and Actions

Objective	Objective 3: Adopt collaborative approaches to understanding and managing flood risk assets and systems, prioritising the implementation of nature-based solutions.
Measure	3.3 - Support the implementation of nature-based solutions
Actions	3.3.1 - Inform communities and stakeholders on the benefits of nature-based solutions through online resources and in person meetings. 3.3.2 - Review and document barriers to implementation of nature-based solutions. 3.3.3 - Signpost and consolidate national and county-scale best practice nature-based solutions projects.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA1: Population, Equalities & Human Health	+/-	M	I	R	R	P	LT	This measure is likely to have both positive and negative effects for population and human health. Nature-based solutions will contribute to reducing the effects of flooding in West Sussex. This could be achieved through urban greening, meadows or coastal wetlands which may may improve recreational amenity depending on what is implemented whilst reducing distress caused by flooding on the community. However, there are costs associated with implementing nature-based solutions in individual homes so this may not be accessible for all members of the community, increasing flood inequalities.
SEA2: Economy	+/-	M	I	R	R	P	LT	This measure is likely to have both positive and negative effects on economy. Sharing knowledge of best practice and if urban green spaces among other nature-based Solutions are implemented by businesses, it could increase flood risk resilience however this would come at a financial cost.
SEA3: Biodiversity	++	H	D	R	R	P	LT	This measure could have significant positive effects on biodiversity through improved natural habitat to encourage diverse flora and fauna when applying best practice nature-based solutions.
SEA4: Landscape and Townscape	++	H	D	R	R	P	LT	This is likely to have significant positive effects if nature-based solutions are applied such as urban greening, improvements to native woodland and meadows for example, decreasing surface runoff and improving flood resilience. This is likely to contribute to improving the landscape character and visual amenity of West Sussex's landscapes.
SEA5: Historic Environment	+	M	I	R	R	P	LT	This is likely to have an indirect positive effect on the historic environment based on improved flood resilience which would provide protection to heritage assets and enhancements to the settings of assets as a result of the wider benefits to the landscape.
SEA6: Water Environment	++	H	D	R	R	P	LT	This is likely to have a significant positive effect on the water environment as Nature Based Solutions will slow the flow of water, preventing flash flooding and minimising pollution entering water bodies in West Sussex, improving water quality.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA7: Flood Risk	++	H	D	R	R	P	LT	Significant positive effects are anticipated as a result of this measure. Passing knowledge of nature-based solutions through communities and stakeholders, and consolidating best practice solutions will, in turn, reduce flood risk within West Sussex.
SEA8: Climatic Factors	?	N/A	N/A	N/A	N/A	N/A	N/A	This measure currently has uncertain effects. If nature-based solutions are implemented using best practice this could improve climate resilience across West Sussex, through implementing green spaces within critical infrastructure, improving drainage in soils and reducing surface runoff. However, there is uncertainty as to whether where and what scale this would be introduced.
SEA9: Material Assets	+	L	D	R	R	P	LT	If best practice nature-based solutions are implemented this could improve drainage in the South Downs National Park soils, meadows and agricultural fields, allowing controlled surface water runoff during heavy rainfall and flood events.

Potential Cumulative / Synergistic Effects	**SEA1:** Potential positive cumulative effects through improved knowledge, increased flood resilience and improvement to recreational amenity **SEA2:** Potential positive cumulative effects arising from improved knowledge and increased flood resilience. **SEA3:** Potential positive cumulative effects arising from increased biodiversity and ecosystem services. **SEA4:** Potential positive cumulative effects arising from improved green spaces and landscape setting. **SEA5:** Potential positive cumulative effects upon the setting of heritage assets. **SEA6:** Potential positive cumulative effects on regional water quality through reduced surface runoff. **SEA7:** Potential positive cumulative effects as a result of reduced flood risk. **SEA9:** Potential positive cumulative effects as a result of improved drainage, reduced flood risk and increased flood resilience
Mitigation and Enhancement Measures	**SEA1:** Online educational materials should not be limited to social media with resources publicly available and free to access for those who may not have access to a computer or smartphone. **SEA1:** Measures should ensure information is accessible to all and delivered in a non-technical manner for all members of the community. **SEA3:** Biodiversity targets should exceed mandatory biodiversity net gain of 10% where possible.
Recommendations	The LFRMS could be expanded to include the following stakeholders: local and regional transport bodies.

Objective 4

Measure 4.1

Table C-11 - Assessment of Measure 4.1 and Actions

Objective	Objective 4: Empower our communities to increase their resilience and ability to adapt to flood risk now, and in the future
Measure	4.1 - Create mechanisms for communities to influence flood risk management
Actions	4.1.1 - Identify the significant landowners, community groups, stakeholders by catchment. 4.1.2 - Engage with identified landowners regarding riparian watercourse management responsibilities, requirement for watercourse consents and best practice agricultural land management to influence surface water runoff. 4.1.3 - Continue focused enforcement by Riparian Drainage Project Officers of riparian asset owners to ensure watercourses which are contributing to highway flooding are maintained. 4.1.4 - Develop a flooding toolbox with guidance and communication material for Parish Councils. 4.1.5 - Promote and advocate for community flood wardens in 'at-risk' communities, through coordinated engagement activities such as Parish Council Meetings. 4.1.6 - Continued promotion and collaboration of Operation Watershed to deliver community-led flood projects.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA1: Population, Equalities & Human Health	++	H	D	R	R	P	MT	Significant positive effects have been identified for population and human health. This measure includes a flooding toolbox with guidance and communication material for Parish Councils as well as promoting flood wardens within at-risk areas, both measures are likely to result in a more informed community, in turn reducing the levels of distress during flood events. Operation Watershed in particular focusses on community support to grant funding for flood measures related to drainage infrastructure. This measure could help reduce flood inequalities in terms of flooding exposure to communities and residents in vulnerable areas.
SEA2: Economy	?	N/A	N/A	N/A	N/A	N/A	N/A	It is currently unclear if the engagement of landowners and risk management stakeholders will extend to businesses within the local area. Therefore, uncertain effects have been identified.
SEA3: Biodiversity	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA4: Landscape and Townscape	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA5: Historic Environment	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA6: Water Environment	++	L	I	R	R	P	MT	There is potential for Operation Watershed to continue collaborating with the community and mitigate flooding. Engaging the land owners regarding riparian watercourse management and best practice for agricultural land management could reduce surface water runoff, resulting in less of water pollution entering water bodies during flash flooding and benefit water quality.
SEA7: Flood Risk	++	M	D	R	R	P	LT	Significant positive effects are anticipated for flood risk as a result of this measure. Operation Watershed works to address issues with ditches and roads, this additional engagement with communities aims to contribute to flood risk resilience within homes, businesses and highways across the region.
SEA8: Climatic Factors	+	L	I	R	R	P	MT	Minor positive effects have been identified for this measure. Engagement with communities will result in increased awareness to the effects of flooding, especially Operation Watershed which aims to resolve damage to roads and improve resilience to highways and businesses through funding better drainage infrastructure. Continued work on watercourses by Riparian Drainage Project Officers also contribute to reducing highway flooding. This will help to mitigate the effects of climate change on transport infrastructure and lead to reduced customer disruption during flood events.
SEA9: Material Assets	?	N/A	N/A	N/A	N/A	N/A	N/A	The effects of this measure are currently uncertain as it will through individuals and landowners to implement best practice to protect soils and agricultural land from the effects of flooding.

Potential Cumulative / Synergistic Effects	**SEA1:** Potential positive cumulative effects from improved community engagement initiatives. **SEA6:** Potential positive cumulative effects upon water quality. **SEA7:** Potential positive cumulative effects on flood risk resilience. **SEA8:** Potential positive cumulative effects on the impact of climate change.
Mitigation and Enhancement Measures	**SEA1:** Communication should not be limited to social media. Measures should ensure that all groups are reached inclusively and in a timely manner. Consideration should be given to those who may not have access or the knowledge to access the internet and/or a smart phone.
Recommendations	The LFRMS could be expanded to include the following stakeholders: local and regional transport bodies.

Measure 4.2

Table C-12 - Assessment of Measure 4.1 and Actions

Objective	Objective 4: Empower our communities to increase their resilience and ability to adapt to flood risk now, and in the future
Measure	4.2 - Improve understanding and adoption of flood preparedness at a community scale
Actions	4.2.1 - Signpost guidance for community-level preparedness in vulnerable areas, including property level resilience on WSCC website and community hubs. 4.2.2 - Attend community events via collaboration with WSCC Engagement and Communities teams and encourage attendance of RMAs. 4.2.4 - Collaborate with schools to develop awareness around flood risk through STEM events. 4.2.5 - Implement learning outcomes from the Rapid Adaptation Pathway Assessment pilot study for better adaptation planning.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA1: Population, Equalities & Human Health	+	M	D	R	R	P	LT	This measure is anticipated to have minor positive effects on population and human health. Engaging with communities through multiple outlets is anticipated to reduce the levels of distress caused by flooding, particularly within children. There is also potential that this may reduce inequalities in terms of flooding exposure, ensuring that communities and residents in vulnerable areas are provided with guidance, including property level resilience.
SEA2: Economy	+	M	D	R	R	P	LT	Minor positive effects are anticipated for economy as it is anticipated that increased understanding and adoption of flood preparedness is likely to result in improved flood risk resilience and reduced economic damage in the long term.
SEA3: Biodiversity	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA4: Landscape and Townscape	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA5: Historic Environment	?	N/A	N/A	N/A	N/A	N/A	N/A	It is currently uncertain if organisations managing heritage assets will also be engaged with as part of this measure, Although it would likely result in improved resilience of heritage assets to flooding.
SEA6: Water Environment	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA7: Flood Risk	+	M	D	R	R	P	LT	Minor positive effects are anticipated for flood risk as a result of this measure. It is anticipated that engagement with flood preparedness and community activities for all ages will, in turn, reduce flood risk within West Sussex and inform flood risk resilience within the region.

SEA Objective	Significance	Magnitude	Nature of effect	Spatial Extent	Reversibility	Permanence	Duration	Description of potential Effects
SEA8: Climatic Factors	+	M	D	R	R	P	LT	This measure is anticipated to have minor positive effects on mitigating the effects of climate change using outcomes from the RAPA pilot study. This may help susceptible transport and critical infrastructure respond to climate change. The adaptation pathway approach monitors certain indicators influencing climate change and tracks changes to consider a range of future scenarios to plan accordingly the best mitigation to climate effects.
SEA9: Material Assets	?	N/A	N/A	N/A	N/A	N/A	N/A	It is currently uncertain if organisations managing the South Downs National Park will also be engaged with as part of this measure. If groups are engaged with, this may result in improved resilience to flooding over the region.

Potential Cumulative / Synergistic Effects	**SEA1:** Potential positive cumulative effects as a result of reduced distress, flood risk inequalities, and improved community engagement. **SEA2:** Potential positive cumulative effects as a result of reduced economic damage. **SEA7:** Potential positive cumulative effects as a result of reduced flood risk within West Sussex. **SEA 8:** Potential positive cumulative effects as a result of improved resilience to climate change.
Mitigation and Enhancement Measures	**SEA1:** Measures should consider those who may not have access or the knowledge to access the internet and/or a smart phone and be freely available.
Recommendations	This measure could be expanded to include the following groups/organisations: South Downs National Park Authority, Environment Agency, Historic England, transport links across the region.

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