Humber River Basin District Second Cycle Flood Risk Management Plan - Strategic Environmental Assessment: Non-Technical Summary

For external consultation October 2021

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Non-technical summary

This is a summary of the environmental report for the draft second cycle Humber Flood Risk Management Plan (FRMP). The environmental report presents the results of a strategic environmental assessment (SEA) carried out as part of the preparation of the draft second cycle FRMP. The environmental report and this summary must be published with the draft plan so that people can understand and comment on how the environmental effects should be considered in the development of the final flood risk management plan.

The draft Humber Flood Risk Management Plan

The draft second cycle FRMP is a plan to manage significant flood risks in the Flood Risk Areas (FRAs) identified in the Humber River Basin District (RBD). Producing the FRMP for these areas is a requirement of the Flood Risk Regulations (2009).

It is recognised, however, that there are areas at risk of flooding outside of these FRAs. The Environment Agency, lead local flood authorities (LLFA) and other risk management authorities (RMAs) will continue to plan for and manage the risk of flooding to all communities. The draft FRMP has therefore been expanded to also show what is happening in other areas of the RBD that are outside of FRAs.

The Environment Agency worked together with other RMAs in the RBD to develop the first cycle FRMP in 2015. This was to create a plan to manage the risk from all sources of flooding. The second cycle draft FRMP builds on this approach.

The Environment Agency has developed a new mapping tool called flood plan explorer for this second cycle of flood risk management planning. You can use flood plan explorer to find out information about all the plan's proposed measures.

Environmental context

Current state of the environment and its characteristics and the likely changes in the future

The Humber River Basin District (RBD) drains around a fifth of the area of England. It covers an area of around 26,000 square kilometres (km^2). Flood risk is comparatively high. Around 10% of those who live within the Humber RBD are at risk of flooding from rivers or sea. In catchments near to the low-lying areas of the Humber estuary or close to coastal areas, the risk is much greater. In the Hull and East Riding catchment, for instance, almost 60% of the population are at risk of flooding.

There are 16 management catchments that make up the Humber RBD. Some catchments remain in a more natural state, whereas others have been significantly altered by human activity to reduce the risk of flooding, or to drain the land for agriculture.

The main economic sectors within the RBD are wholesale and distribution, business services, and health. Manufacturing and mineral abstraction also contribute to the economy. Agriculture is the main rural land use.

The Humber RBD is one of the most diverse regions in England in terms of landscape. This diversity is reflected by the large number of different National Character Areas within the Humber RBD and by the range of designated landscapes. Within the Humber RBD there are also 3 national parks, 4 areas of outstanding natural beauty, and 3 heritage

coasts. These support the economy through tourism. Industrial decline and mining have left a legacy of neglected landscapes in some places.

The varied landscape supports a rich diversity of wildlife and habitats many of which are of national and global importance. This is reflected by the abundance of sites that are protected for their conservation value. There are a total of 31 Special Areas of Conservation (SAC), 9 Special Protection Areas (SPA) and 4 Ramsar sites in the Humber RBD. These include the Humber estuary, the Lower Derwent Valley, Malham Tarn, and Midland Meres and Mosses. There are also more than 2,750 sites of special scientific interest (SSSIs) and 23 National Nature Reserves (NNR). There are also 2 marine conservation zones adjacent to the Humber RBD's coast (Runswick Bay and Holderness Inshore).

The waterbodies and wetland areas support protected species such as otter and water vole, and priority species such as white-clawed crayfish. Invasive species, such as Himalayan balsam, giant hogweed, Japanese knotweed, mink, and signal crayfish, are present in many catchments across the Humber RBD.

Soils within the RBD range from shallow, well-drained, calcareous and silty soils over chalk and limestone to seasonally wet and deep clays and loams within the river valley bottoms. In the middle of the RBD, soils are sandy and coarse due to the presence of the underlying sandstone geology. Within the highland areas to the northwest there are very acid, raw peat soils. 85% of the Humber estuary's floodplain is farmed. This agricultural land is among the most productive in the UK.

Climate change is likely to bring about changes which could put pressure on various aspects of the environment, such as water quality and water resources, soils, landscape, heritage and biodiversity. Urbanisation and population growth, particularly in urban fringes, is also likely to add to the pressures on locally valued landscapes and habitats. Key infrastructure developments within the Humber RBD include HS2, energy parks and offshore wind farms that could have landscape and seascape impacts.

Existing environmental problems and issues

Whilst many SSSIs within the RBD are in a favourable condition, some are in an unfavourable condition. Water abstraction, water shortages, flooding and coastal erosion are the main threats.

The Humber contains a disproportionally high number of deprived neighbourhoods which is reflected in lower average life expectancies than for other areas of the UK. Numerous town and cities in the Humber RBD had a thriving industrial past, but have experienced a steep reduction in employment. In rural areas, areas of deprivation are characterised by low incomes alongside poor access to services.

Soil is a limited resource and is under pressure from climate change, population growth, urban development, waste, pollution. The demand for more (and cheaper) food. Across the UK and within the Humber RBD, intensive agriculture has caused arable soils to lose 40 to 60% of their organic carbon, and the impacts of climate change pose further risks (Environment Agency, 2019).

There are a range of pressures on groundwater quality and surface waters across the Humber RBD. For example, mining in some areas has effects on groundwater quality whilst agriculture and industry negatively affects surface waters. Contamination of water bodies and pollution into rivers, streams and seas is also an issue in the Humber.

Landscapes and heritage that are already protected are likely to retain their statutory protections. Many strategies and local plans also aspire to improve the landscape character of damaged or degraded locations. However, as there is increased demand for housing and infrastructure, there will be pressures on the ability to protect these areas.

Relevant plans, programmes, policies and objectives

A review of relevant plans, programmes and policies at a national and local level was undertaken as part of the SEA. Plans, programmes and policies that could interact with the draft second cycle FRMP are identified.

At a national level, the government's approach to delivering the Global Goals for Sustainable Development sets out how the government is delivering against the goals. One of the 17 Sustainable Development Goals (SDGs) is to make cities and human settlements inclusive, safe, resilient and sustainable. The Defra group will contribute to this goal through actions to reduce the risk of flooding. In addition, the government's 25 Year Environment Plan sets out goals for improving the environment within a generation. One of its goals is to reduce the risk of harm from environmental hazards such as flooding and drought. The draft National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England is a collective vision for future flood and coastal risk management. The surface water management action plan (SWMAP) sets out the steps the government is taking, with the Environment Agency and others, to manage the risk of surface water flooding. The National Planning Policy Framework (NPPF) outlines several broad policies in relation to flood risk.

Other national plans, policies and programmes that could interact with the draft FRMP include:

- UK Marine Strategy
- Biodiversity Net Gain
- Nature Recovery Network
- Environmental Land Management System
- English Trees Action Plan
- English Peat Action Plan
- UK Shared Prosperity Fund
- National Infrastructure Delivery Plan
- Water Framework Directive
- Clean Growth Strategy
- UK Climate Change Act

Local plans, policies and programmes were also identified including:

- within the Humber, strategic flood risk assessments (SFRA) have been prepared by local planning authorities (LPAs) which can inform future flood management and emergency planning decisions
- the Humber flood risk management strategy (2008) outlines a strategy for managing tidal flood risk across the Humber estuary. The strategy is currently being reviewed to ensure that it still meets future needs
- 2 shoreline management plans identify the most sustainable approach to managing coastal flood and erosion risks in the short, medium and long term. These are: The Tyne to Flamborough Head Shoreline Management Plan, and The Flamborough Head to Gibraltar Point Shoreline Management Plan

- there are several plans and policies that operate at a local level. Through the SEA process the ones that are most relevant in terms of potential interactions with the draft second cycle FRMP have been identified and are presented here. The Living with Water project, for instance, aims to reduce the risk of flooding in Hull. It takes a partnership approach and focusses on community-level initiatives. It draws on expertise from Hull City Council, East Riding of Yorkshire Council, Yorkshire Water, the Environment Agency, and the University of Hull

Other local plans, programmes, policies that could interact with the FRMP include:

- 2008 Humber Flood Risk Management Strategy 'Planning for the Rising Tides'
- Humber River Basin Management Plan (RBMP)
- Biodiversity Net Gain in local plans and policies
- environmental land management schemes (ELMS)
- the 'Northern Forest' initiative
- Humber Industrial Strategy (being developed by Humber Local Enterprise Partnership - LEP)
- Hull lagoon infrastructure project
- drainage and wastewater management plans
- Environment Agency Asset Management Strategy 2017-22
- historic landscape characterisation studies
- green infrastructure strategies
- biodiversity action plans
- open space strategies
- community forest plans
- water companies' 5-year resource plans
- air quality management areas (AQMA)
- local development plans

Strategic Environmental Assessment

Assessment of alternatives

As part of the assessment consideration was given to possible alternatives to the draft strategy. This included looking at a 'do nothing' alternative that assumed no action is taken to revise the first cycle FRMPs. This alternative was rejected because the Flood Risk Regulations 2009 (FRRs) require the FRMPs to be reviewed and revised every 6 years.

The assessment of alternatives also considered options for developing FRMPs. In preparing the first cycle FRMPs a three month consultation on how the plans should be developed was undertaken. The consultation presented three strategic options relating to development of the FRMPs including. As a result of the consultation it was agreed that a consolidated plan would be developed in partnerships with LLFAs and other RMAs. As the FRRs require the second cycle FRMPs to review, update and build on the first cycle plans, the same strategic approach has been taken to develop the second cycle FRMPs.

At the individual plan level place based alternatives were considered. The approach to developing and agreeing the objectives and the measures to be included in the draft FRMP differed between RBDs. Some held face to face or virtual workshops while others developed and refined measures via technical correspondence. In all cases the views of

environmental and SEA specialists were central to this process, helping to shape and influence the plans and the measures which they comprise.

The proposed measures of the draft FRMP for the Humber river basin district aim to build on first cycle FRMPs in setting out the future flood risk management needs. At the RBD scale they tend to set preliminary actions for the future investigation and development of business case appraisals and options. As such, further planning processes and supporting environmental assessments will focus on alternatives at these programme and project levels

Summary of significant environmental effects and mitigation actions and enhancement opportunities by each environmental topic

Biodiversity, including flora and fauna

The implementation of the draft second cycle FRMP is likely to result in both positive and negative effects on biodiversity. Due to the existence of sensitive habitats in the Humber, some of the effects could be significant. It is likely that the greatest benefits to biodiversity (for example habitat creation, restoration and management) resulting from the draft plan will be delivered in the medium to long term. It is anticipated that most of the proposed measures that are likely to offer these benefits involve the investigation, planning and delivery of flood and coastal risk management interventions.

Measures that include working with natural processes are expected to offer the greatest benefits. These comprise natural flood management approaches (NFM), land management and sustainable drainage systems (SuDS). These measures could lead to the establishment of new habitats and ecological networks whilst offering protection to existing habitats. These measures are planned to be delivered in both urban and rural environments. In urban environments, these types of measures could offer significant benefits by establishing and improving blue/green infrastructure and SuDS. This could help to improve urban ecology of strategically important urban areas including Birmingham, Hull and Nottingham. Many authorities will need to consider biodiversity net gain for the delivery of flood and coastal risk management interventions. When delivering these works there could be the potential for biodiversity loss in the short-term due to the need to access and deliver changes. For example, re-naturalisation of the watercourse could require some excavation and disruption to river-based habitats. However, it is expected that biodiversity should recover, be enhanced and be protected by these measures.

Measures in the draft plan which investigate risk management approaches that work with nature could lead to positive benefits in the future if the work informs subsequent planning and delivery of schemes. New approaches and research could support better place-based decision making for the delivery of schemes that could boost outcomes for the environment and biodiversity.

Some measures have the potential for negative effects on biodiversity, for example those measures involving the construction of flood alleviation schemes. This is particularly the case where they need to be delivered in or if they could impact environmental sensitive areas such as sites of special scientific interest (SSSIs), Special Areas of Conservation (SACs) and Ramsar sites. Additionally, some measures are implemented in areas that are

susceptible to coastal squeeze where priority coastal and wetland habitats and SSSIs are located. This is particularly true for the Hull Estuary. For these measures it is particularly important to seek to avoid impacts, or if not possible adopt suitable mitigation measures and enhancement opportunities.

It is important to note that at this stage and given the strategic nature of the draft second cycle FRMP, the details available on the type and scale of many measures delivering flood alleviation interventions are very limited. This means that there are uncertainties regarding the potential effects on biodiversity likely from the implementation of the draft plan.

When implementing measures involving construction, habitat regulations assessments (HRAs) and other lower tier assessments will be undertaken, and recommendations should be followed. This should ensure that environmental implications will be considered in greater detail. Ecological expertise and relevant organisations, including Natural England, should be consulted at the early stages of any measures involved in the planning and delivery of flood alleviation schemes. Greater collaboration between risk management authorities, planning authorities and developers should be encouraged to deliver better environmental outcomes through the exchange of knowledge, resources and best practice.

Where the type of flood alleviation solutions is uncertain in the draft plan, a nature-first approach should be used. Where it is not feasible to deliver nature-based approaches, strict mitigation and enhancement procedures should be followed.

Population and human health

Overall, the draft second cycle FRMP is likely to have significant positive effects on population and human health, particularly in the medium to long term. This supports the delivery of the draft plan's key objectives of flood protection and increased flood resilience of communities within the RBD. The draft plan includes measures to support the planning and delivery of flood alleviation schemes in order to lower flood risk and support communities' ability to cope with the consequences of flooding. Measures are also likely to support greater engagement and collaboration with communities and relevant stakeholders. This could improve resilience for communities in the future. Some measures will also support the response and recovery to flood events that could help reduce the impact of flooding and help residents and businesses return more quickly.

Measures involving the planning and delivery of flood risk interventions are likely to have the greatest effects on population and health. Reduced flood risk offered by these solutions can contribute to the reduction of anxiety for residents and businesses, offering benefits to mental health. Many measures in the draft second cycle FRMP are likely to improve the provision of and access to green space. These interventions offer the greatest number of co-benefits for population and human health. These measures could provide opportunities for recreation and wellbeing. The measures may also enhance the local landscape of the area and help regenerate communities in the long-term.

Areas of deprivation and social inequality can have increased vulnerability to the risk of flooding and coastal change and could be less able to cope with its consequences. The draft plan aims to reduce these risks having overall benefits for deprivation and social inequality. Some property flood resilience (PFR) measures are included in the draft plan. These measures can reduce the impact of flooding to properties. This could offer immediate benefits in the short-term if a flood event occurs. However, these measures may not offer long term protection against climate related risks.

During the delivery of interventions proposed by the draft second cycle FRMP there could be some short-term negative effects on population and human health. These could include potential disruption in delivery and quality of services (like water supply, electricity, public transport), roadworks, noise pollution, pollution from construction dust, and construction waste.

Measures delivered in potentially ecologically sensitive areas should ensure that habitats and green spaces are protected to continue to provide benefits to the local population. Additional support may be needed to ensure stakeholder engagement and decision-making is inclusive of all sectors of the community. Greater collaboration with communities to inform and include in decision-making could support better place-based decision making. These approaches can also be used to identify solutions to mitigate potential disruption or negative effects that may result from these measures. Flood alleviation solutions offering the greatest co-benefits to human health and wellbeing should be delivered using a nature-first approach.

Soil

It is likely that the draft second cycle FRMP will have both positive and negative effects on soil. The effects for some measures in the draft plan could be positive or negative depending on the chosen flood alleviation measures and how they are implemented. Measures that are likely to bring about these effects involve the planning and delivery of flood alleviation interventions and asset maintenance.

Measures in the draft plan that are most likely to deliver positive effects, work with nature to deliver flood alleviation solutions. These include NFM, nature-based solutions (NBS), catchment-based approach (CaBA). These interventions could improve filtration of sediment and reduce soil erosion. Some work will involve collaborating with relevant stakeholders to support the delivery of better land management techniques that could offer benefits to soils in the medium to long term.

Some measures in the draft plan have the potential for negative effects. These include the construction of flood alleviation solutions, including defences and culverts. These measures can result in geomorphological changes such as increased erosion or changes in sediment flow.

Lower tier assessments should be undertaken, and practice adopted to avoid damage to soils during the construction, operation and demolition of any flood alleviation intervention. Where loss is unavoidable, soil quality should be compensated for. Guidance should be provided to risk management authorities to provide the knowledge and skills needed to ensure that soils are protected and managed.

Water

Overall, the draft second cycle FRMP is likely to result in mostly positive effects but also potentially some negative effects on water quality across the RBD. Many measures in the draft plan involve the planning and delivery of flood alleviation measures and aim to reduce local flood risk and increase attenuation. This involves the planning and delivery of flood alleviation measures and supporting investigations to model and assess flood risks.

Measures in the draft plan which deliver flood alleviation measures that work with nature (for example NFM, SuDS, green infrastructure, natural storage) are most likely to deliver positive effects. The measures offer benefits to water through improved attenuation and infiltration whilst offering opportunities to deliver habitat creation and water quality

improvement which could benefit aquatic habitats. There are also measures which aim to improve land management practices that could also benefit water quality.

Measures in the draft plan aim to investigate and potentially deliver opportunities for improving surface water management that could reduce the risk of flooding from surface water. This could offer benefits by reducing pollution from run-off. In addition, maintenance of sewage networks could reduce the potential for water contamination.

Measures involving construction may lead to temporary negative effects on water quality. In addition, some built flood alleviation infrastructure, such as culverts and defences, can denaturalise the watercourse and separate flood plains which may conflict with the Water Framework Regulations (WFD).

The effect on water quality of several measures involving the delivery of risk management solutions is uncertain as the details of the types of measure that will be implemented at this stage is not known.

WFD assessments of the draft second cycle FRMP should be delivered to ensure the draft plan complies with WFD objectives. Under the water environment (WFD) regulations any works, arising from the FRMP, which could affect the ecology, water quality or hydro-morphology of any classified waterbody requires an assessment. The purpose of this assessment is to demonstrate how any adverse impacts will be mitigated and, where possible, the status of the waterbody enhanced in order to achieve the required objective. Where the implementation of individual measures has the potential to negatively affect a waterbody, WFD assessment will be undertaken at a project level and reported on at that time.. Collaboration with key stakeholders and the provision of training should enable the sharing of learning and deliver better outcomes for water quality. Where possible, measures should use a nature-first approach.

Climatic factors

Overall, the effects of the draft second cycle FRMP on climatic factors are likely to be both positive and negative. The draft plan is likely to support adaptation to climate-change driven flood risk. Measures in the draft plan that are likely to contribute to climate-change adaptation directly involve the planning and delivery of flood risk management solutions. In addition, measures that support the preparation for and recovery from flooding and coastal change also offer benefits.

The delivery of some flood alleviation solutions by working with nature, offer lower carbon alternatives to hard engineered solutions. Some solutions may also offer the opportunity to sequester carbon through the establishment of habitats, particularly true for woodland and peatland restoration. Authorities will investigate opportunities to reduce flood risk through these types of solutions to ensure alignment with net zero commitments.

Some hard engineered flood risk solutions are included in the draft plan. These could add to greenhouse gas emissions through the embodied carbon in the materials and during the construction stages from vehicles. However, these measures also offer positive benefits to climate change adaptation by reducing flood risk to communities.

The precise nature of flood alleviation solutions proposed by the draft second cycle FRMP is uncertain, therefore their effects on environmental topics are also uncertain. However, it is likely that these measures will have either positive effects or positive and negative effects depending on whether a nature-first approach is feasibly delivered. Where a nature-first approach is not feasible, local low-carbon materials should be used.

In addition, authorities conducting investigations into potential climate change risks should ensure that wide climatic factors are accounted for. For example, how to use nature-based solutions to reduce future risks associated with climate-driven low flow scenarios.

Material assets

Overall, the draft second cycle FRMP is likely to result in positive effects on material assets across the RBD. It offers benefits to material assets such as providing protection to homes, businesses, infrastructure, and agricultural land. Most measures in the draft plan support the planning and delivery of flood alleviation measures or the preparing for and recovering from flooding. These measures are likely to improve the resilience of communities and protect assets.

Prioritisation should be followed to ensure that areas of deprivation and high risk are considered for flood alleviation schemes. Engagement should be explored at early stages of flood alleviation planning to provide opportunities to share knowledge on community values and important material assets in a community. Evaluation may be needed to ensure that engagement measures adequately equip residents, businesses owners, critical infrastructure providers and other stakeholders to build their own resilience to future flood events.

Cultural heritage

The Humber area is rich in important cultural heritage. The draft second cycle FRMP could result in both positive and negative effects on cultural heritage. Measures that are most likely to bring about these effects involve the delivery of flood alleviation measures, as well as improvements and maintenance of existing flood risk assets.

These measures in the draft plan could reduce flood risk and the damaging consequences of flooding to historic areas in the Humber. For example, natural flood management approaches can reduce the flood risk to heritage assets in the surrounding area by slowing the flow of water upstream, reducing flood risk further downstream. However, the implementation of the NFM measures themselves can have a negative impact on heritage assets. For example, tree planting can lower ground levels, impacting on buried archaeological remains, and altering the water levels or water content of the soil. This could affect the preservation of waterlogged remains, and they could affect the setting of heritage assets. Hard engineering solutions may involve ground disturbing excavations which could truncate or destroy archaeological remains. The construction of flood walls and other flood defences could also have a visual impact on historic buildings and conservation areas. Good design and choice of materials and finishes for hard engineered solutions are important regarding the setting and visual impact on cultural heritage. As there are numerous historic sites in the area, there will likely be some potential impact. However, there are large uncertainties as to the effect as this will depend on the type of intervention and the sensitivity of the receptor.

Some measures delivering improvement and maintenance to existing flood risk assets may offer benefits to cultural heritage by improving flood risk mitigation, therefore supporting the conservation of heritage assets. As these flood risk assets are existing, there is a lower potential for negative effects on heritage.

Designated and non-designated heritage assets and any potential negative impacts upon them should be identified at the planning stage, in order that the impact can be avoided or reduced. Environmental assessments of plans, strategies and proposals should be

informed by cultural heritage assessments and field evaluations where appropriate, including consideration of conservation areas at local scale. Collaborative approaches that work with heritage partners and expertise, including Historic England and the local authority archaeological advisors and conservation officers, should be used to support better decision making for the historic environment. Consultation with the relevant organisation (for instance Historic England for scheduled monuments) is necessary where a heritage asset is likely to be affected by a measure.

Impact on a heritage asset of archaeological interest should be avoided where possible. Where impact cannot be avoided, mitigation measures, such as archaeological recording and excavation in advance of impact, will be needed.

Landscape

While the effects of the draft second cycle FRMP on landscape across the RBD are likely to be mostly positive, some negative effects could occur. Of the proposed local measures in the second cycle FRMP, no measures are likely to have significant effects on landscape across the whole RBD. However, there is the potential for positive, localised effects. Measures likely to bring about effects on landscape are measures involving the delivery and planning of flood alleviation interventions, respectively.

Measures that work with nature are most likely to result in positive effects. In both urban and rural areas, these measures could contribute to landscape (townscape or seascape) character protection and enhancement. However, these measures may involve activities (like tree planting, terrain shape and barrier modifications). This could have negative effects on landscape (townscape or seascape) character at a local scale unless undertaken sympathetically. In addition, measures in the draft plan involving the construction of built flood infrastructure, such as flood walls and barriers, could also lead to negative effects on landscape at a local scale by changing aesthetic features of the area. These types of measures could significantly alter the character by changing the aesthetic, perceptual and experiential features of the area.

At this stage, there is limited detail available on the type of flood alleviation intervention that will be delivered as part of the second cycle FRMP for several measures. This limits the ability to assess the potential impact on landscape. It could result in both positive and negative depending on the type of measure implemented and the sensitivity of the landscape.

Environmental assessment of plans, strategies and proposals including flood alleviation interventions should be used to inform the protection and enhancement of the landscape. National and local data which characterises landscape should form part of landscape and visual impact assessments. Measures in the draft plan that involve the delivery of flood alleviation schemes should seek solutions which will offer the best opportunities to enhance landscape. Partnership approaches involving landscape are likely to deliver more favourable outcomes for landscape through the sharing of knowledge, best practice and resources.

Interrelationship between the above factors

Whilst the assessment highlights the potential effects of measures on each environmental topic, it is important to note that there are potential interrelationships between topics. However, the effects of the potential interrelationships between environmental topics are uncertain given the level of detail available in the draft plan at this stage. For most topics,

measures that have positive effects on a topic could also have positive effects on another topic. Holistic approaches are more likely to offer positive results across a range of environmental topics.

Proposed measures in the draft second cycle FRMP which work with natural processes are likely to have positive interrelationship between topics such as biodiversity and water quality, soils and material assets. Another example involves the interrelationship between cultural heritage and landscape. These topics both benefit from measures that improve the aesthetic experience of an area.

The draft plan is likely to have benefits for population, health and material assets. Some measures that are likely to result in benefits for material assets may have negative impacts on other environmental topics. For example, upstream storage may have benefits to population and health by reducing flood risk and enhance climate change adaptation, however there may be negative effects on heritage, carbon emissions, soil and biodiversity. It is important that mitigation and enhancement opportunities are followed to identify synergies and deliver the best outcomes across all environmental topics.

Overview of the environmental effects of the draft plan

The significant environmental effects of national level measures

On balance the national measures in the plan are assessed as having significant positive effects on population and human health, with effects on biodiversity assessed as potentially negative and all other environmental issues assessed as neutral.

The assessment recognises the potential for individual national measures to have positive and/or negative environmental effects as described in the sections above. The actual environmental effects will depend on the nature and extent of the actions that arise from the national measures and local environmental conditions.

Given the widely acknowledged global climate and nature emergencies, environmental issues are increasingly important in a strategic context. It is therefore important that national measures are actively implemented in a way that gives consideration to their environmental consequences. The Environment Agency's well-established approach to assessing and managing environmental risk and opportunity at a programme and project level will play an important role in minimising negative effects and maximising positive effects from these actions as they are implemented. It is anticipated that lead local flood authorities (LLFAs) will have similar controls in place.

The balance of negative and positive effects associated with national measures is likely to skew more strongly towards positive over the duration of the plan as the Environment Agency and LLFAs make progress towards net zero carbon and environmental net gain targets and as nature first ways of working are embedded in standard practices.

The significant environmental effects of collections of measures in key locations

The draft second cycle FRMP includes 58 locations that are at significant risk of flooding:

- 56 Flood Risk Areas (FRAs) (39FRAs for significant risk of flooding from main rivers and the sea and 17 FRAs for significant risk of flooding from surface water)
- 2 Strategic Areas for significant risk of flooding mainly from main rivers and the sea (Humebr Estuary and Fens and Lowland)

These were all reviewed as part of the SEA process.

6 FRAs (Gilberdyke FRA, Goole FRA, Hedon FRA, Hessle FRA, Thorngumbald FRA and York FRA) and both SAs (Humber Estuary SA and Fens and Lowland SA) were scoped out of this SEA. This is either because they only include existing first cycle FRMP measures that have already been assessed as part of the SEA for first cycle FRMP, or they only included measures for which limited details are currently available meaning their environmental effects cannot be fully assessed. Fens and Lowland SA is considered in the SEA for Anglian River Basin District (RBD) Second Cycle Flood Risk Management Plan.

About two thirds of all the FRAs included in the draft second cycle FRMP only include preparing and preventing measures. These types of measures are unlikely to cause any physical changes on the ground and so are unlikely to result in any direct effects on the environmental topics. However, these measures are likely to contribute to positive effects on population and human and material assets as they aim to reduce the risk of flooding. These can also improve the understanding of flood risk, and increase the flood resilience, awareness and preparedness of communities at risk.

The cumulative assessment of the measures in key locations on each of the environmental topics is focused on the FRAs which include measures which are likely to result in environmental effects. There are 13 such FRAs included in second cycle FRMP including:

- The Birmingham Surface Water Flood Risk Area
- The Brigg Rivers and the Sea Flood Risk Area
- The Burton-on-Trent Rivers and Sea Flood Risk Area
- The Chesterfield Surface Water Flood Risk Area
- The Derby Surface Water Flood Risk Area
- The Derby Rivers and Sea Flood Risk Area
- The Fazeley Rivers and Sea Flood Risk Area
- Kingston upon Hull Rivers and Sea Flood Risk Area
- Kingston upon Hull and Haltemprice Surface Water Flood Risk Area
- The Nottingham Surface Water Flood Risk Area
- The Selly Park Rivers and Sea Flood Risk Area
- The Sheffield Rivers and Sea Flood Risk Area
- The Sparkhill Rivers and Sea Flood Risk Area

Environmental effects in these FRAs are most likely to arise from proposed protecting measures including interventions such as NBS, NFM, SuDS, deculverting, upper catchment storage, construction or restoration of flood risk management assets. As a result of reducing the flood risk and improving the resilience of communities, properties, infrastructure, services and heritage assets, protecting measures are likely to have positive or particularly in FRAs with larger population (for example Birmingham, Derby, Burton upon Trent, Fazeley, Kingston upon Hull, Nottingham, and Chesterfield) significant positive effects on population and human. Most of the more populated FRAs mainly cover city centres with significant infrastructure. Therefore, the effect of the proposed measures on material assets in these FRAs is also likely to be significant positive.

While the effects on the other environmental topics across all 13 FRAs are mainly likely to be positive, the proposed measures could also result in negative effects on biodiversity, soil, air, water, climate, and landscape. The potential positive effects such as biodiversity enhancement and habitat creation, reduced compaction of soils, better water quality, and carbon sequestration, are mainly associated with protecting measures that work with

nature (for example NBS, NFM, SuDS, introduction of green/blue infrastructure). These are likely to be most obvious in Birmingham, Nottingham, Burton upon Trent, Fazeley, Brigg, Selly Park and Sparkhill FRAs. They are characterised as predominantly urban residential areas, city centres, or industrial areas. Interventions such as introduction of green/blue infrastructure could (significantly) improve the biodiversity, water and soil quality, local climate, and enhance townscape character. Additionally, they have the potential to have positive effects for tourism and improved health and wellbeing by providing more and better access to green space.

Potential negative effects on biodiversity, water, air, climate, landscape and cultural heritage across the FRAs could predominantly arise from the proposed protecting measures, if they involve construction, decommissioning, as well as excavating and, terrain shape and elevation modifications. The potential negative effects could include biodiversity loss, habitat fragmentation, carbon emissions, soil removal or erosion, alteration of natural watercourses and changes in perception of historic and landscape character. It is likely that these effects can be avoided or mitigated for. More attention to the possibility of these negative effects should be given in FRAs which include historic or nature designated sites and where measures that could include construction activities are proposed such as the Sheffield Rivers and Sea FRA, Chesterfield Surface Water FRA, Kingston upon Hull Rivers and Sea FRA, and Kingston upon Hull and Haltemprice Surface Water FRA, Derby Surface Water FRA, and Derby Rivers and Sea FRA.

For example, in the Sheffield Rivers and Sea FRA both measures proposed that are likely to result in environmental effect are flood risk management improvements and could include various types of flood risk interventions (for example NBS, NFM, built flood risk assets). Due to the character of the FRA (including SAC, SPAs, SSSIs, priority habitats, scheduled monuments and listed buildings), the effects on biodiversity, soil, and climatic factors as well as cultural heritage and landscape are uncertain as they are dependent on the type of work needed to deliver the measures. For example, in comparison to built structures (like culverts, walls, embankments) interventions such as NBS, NFM and SuDS are more likely to result in positive effects on these environmental topics. Measures including construction could potentially lead to habitat fragmentation or loss, emissions that contribute to climate change (particularly if the intervention includes using materials such as concrete and steel), soil erosion, and change in landscape character and heritage assets causing negative effects on related environmental topics.

For each of the 13 FRAs, potential mitigation actions and enhancement opportunities are identified. As the potential negative effects of the measures proposed in the FRAs are most likely to arise from construction activities, next to the key national processes (for example Environment Agency's eMission and biodiversity net gain targets) the mitigation actions to avoid or minimise the negative effects of construction activities commonly include interventions such as:

- implementation of sustainable construction and decommission practices; consultation with relevant organisations (for example Historic England, local authorities, Natural England)
- application for any consents needed
- use of sympathetic design to maximise the potential enhancement opportunities of these measures, (like townscape and landscape character, climate regulation, habitat creation, recreation and tourism)
- consideration and possible preservation or enhancement of landscape and historic features and artefacts

- application of lower tier assessments for the development of plans and projects resulting from the measures in the FRAs as appropriate- to ensure the potential positive and negative environmental effects of the measures throughout their lifecycle (including construction, operation and 'end of life' stages) are considered in more detail, and appropriate mitigation actions and enhancement opportunities are identified

The significant environmental effects of different types of measures

The draft second cycle FRMP proposes about 400 measures including preventing, protecting, preparing and recovery/review measures.

Protecting measures make-up about a quarter of all measures proposed by the draft second cycle FRMP. Interventions include: flood alleviation schemes; flood risk management schemes; flood risk asset construction and maintenance; flood storage; green and blue infrastructure improvements; NFM; NBS; SuDS. These are most likely to result in environmental effects across the RBD. Overall, the protecting measures proposed by the plan are likely to result in largely significant positive effects on population and human health as well as material assets and climate adaptation, due to the reduction in flood risk to communities, homes, businesses, important infrastructure as well as heritage assets across the RBD.

Interventions such as NFM, NBS, green and blue infrastructure improvements, SuDS, and CaBA represent about a third of all protecting measures proposed by the draft plan. These measures are likely to positively affect biodiversity, soil, water, climate factors and landscape across the RBD. These measures can for example result in habitat creation, restoration and enhancement, and bring benefits such as increased biodiversity, climate mitigation, improved water and soil quality, and enhanced landscape character. Additionally, they can bring health and wellbeing benefits by potentially creating more and better access to green space.

While built flood protection assets are likely to play an important role in climate adaptation, negative effects on climate due to emissions that contribute to climate change could potentially arise from some protecting measures proposed in the RBD if they involve construction or decommissioning and use of materials such as concrete and steel. Generally, protecting measures involving construction could potentially also have negative effects on soil and biodiversity causing soil erosion, habitat fragmentation and loss. Protecting measures involving built structures (like flood walls, flood barriers) as well as excavating and landscaping (for example tree planting, terrain shape and elevation modifications) could potentially have negative effects on cultural heritage as well as the setting of heritage assets. This could be the case if they would, for example, significantly alter the historic or landscape character by changing the aesthetic, perceptual and experiential features or negatively affect archaeological remains.

Most of the measures proposed within the RBD (approximately half) are preventing measures. They predominantly include interventions such as flood risk policy development, followed by flood risk assessment, mapping and modelling. Preparing measures represent about a quarter of all measures proposed by the draft second cycle FRMP and mostly include interventions such as raising awareness and improving preparedness of communities at risk of flooding, followed by flood warning and forecasting. There area few local recovery and review measures proposed by the draft second cycle FRMP. They are mostly related to community and business support, and actions taken during a flood event.

These interventions are unlikely to result in any direct immediate physical changes on the ground. Nevertheless, these measures are likely to additionally contribute to the significant positive effects of the second cycle FRMP on population and human health as well as material assets across the RBD by for example developing flood risk management policies and strategies, monitoring their performance, and increasing understanding and knowledge of flooding and processes, improving community flood support, promoting property flood resilience, and supporting local flood groups/wardens

The significant environmental effects of the draft plan overall

Overall, the proposed draft second cycle FRMP is likely to have significantly positive effects on population and human health; predominantly positive effects on water, material assets and landscape; and both positive and negative effects on biodiversity, soil, climate factors, and cultural heritage across the RBD (see Table 1).

Table 1: Summary of SEA assessment findings of draft plan overall by environmental topic

Topic	SEA question	Conclusion of assessment
Biodiversity, including flora and fauna	Does the plan protect and recover nature?	Positive and negative effects
Population and human health	Does the plan improve health, wellbeing and equality?	Significant positive effects
Soil	Does the plan improve and sustain resources?	Positive and negative effects
Water	Does the plan protect and improve the water environment?	Predominantly positive but also some negative effects
Climatic factors	Does the plan help to mitigate and adapt to climate change?	Positive and negative effects
Material assets	Does the plan support communities and a prosperous economy?	Positive effects
Cultural heritage	Does the plan conserve and enhance the historic environment?	Positive and negative effects
Landscape	Does the plan conserve and enhance landscape and seascape character?	Predominantly positive but also some negative effects
Interrelationships	Does the plan have implications for the relationship between the environmental topics?	Yes, interrelationship between effects identified

The effects of the draft plan on population and human health, and material assets are likely to be significantly positive as the measures proposed in the draft plan are likely to result in reducing the flood risk and improving the resilience of communities, properties, infrastructure, services and heritage assets across the Humber RBD. Overall, protecting measures are most likely to result in these significant positive effects. Most of the measures proposed in the draft plan are preventing (approximately half), followed by preparing (approximately a quarter), and some recovery and resilience measures. Together they comprise three-quarters of all the measures introduced by the draft second cycle FRMP. By building (institutional and community) knowledge and awareness and

enhancing resilience of communities and businesses to flooding these measures are likely to further contribute to the significant positive and positive effects of the draft second cycle FRMP plan on population and human health and material assets across the RBD

The effects of the draft second cycle FRMP on water and landscape within the RBD are likely to be predominantly positive. The effects of the second cycle FRMP on biodiversity, soil, and climate and landscape within the RBD are likely to be positive and negative, especially in the short term. The positive effects are most likely to result from protecting measures which work with nature such as: CaBA, NBS, SuDS, NFM, green and blue infrastructure corridors and improvements. This might lead to creation of new, restoration, or enhancement of existing habitats. They make-up about a third of all the proposed protecting measures in the draft second cycle FRMP. They include interventions such as tree planning, creation of ponds, hedgerows, parks, meadows, saltmarshes and other green/blue areas. These measures could lead to higher biodiversity, reduced compaction of soils, improved filtration of sediment and reduced soil erosion, improved water quality, reduced surface water runoff. They could also support the delivery of water framework directive objectives (such as restoring naturally functioning watercourses and reconnecting them with a functioning flood plain), contribute to carbon sequestration and cooling of urban heath islands, and protect, improve and enhance the landscape character. Additionally, they have the potential to have positive effects for tourism across the RBD and improved health and wellbeing by providing more and better access to green space.

The draft second cycle FRMP could also result in negative effects on biodiversity, soil, water, climate and landscape across the RBD. Negative effects such as habitat fragmentation and loss, coastal squeeze, soil degradation and erosion, changes in sediment flow, carbon emissions, alterations of the natural functioning watercourses, and separation of flood plains, could arise from some protecting measures proposed in the RBD if they involve construction, decommissioning, and use of materials such as concrete and steel. Protecting measures involving build structures could negatively affect the character of landscapes across the RBD by altering their aesthetic, perceptual and experiential features.

Overall, the effects of the draft second cycle FRMP on cultural heritage could be positive and negative. The measures proposed by the draft plan are likely to bring benefits to heritage, predominantly through improved flood protection, however, they are also likely to cause some negative effects. For example, protecting measures involving built structures (like flood walls, flood barriers) as well as excavating and landscaping (for example tree planting, terrain shape and elevation modifications) could potentially have negative effects on cultural heritage if they would significantly alter the historic setting of the historically significant sites across the RBD (for example world heritage sites, heritage coast, scheduled monuments) or negatively affect archaeological remains across the RBD.

As evident from the above, there are interrelationships between the effects of the draft plan on different environmental topics. For example, measures proposed in the draft second cycle FRMP that are likely to (positively or negatively) affect biodiversity (for example NFM, NBS, construction works) could also result or contribute to (positive or negative) effects on soil, water, climate and landscape. Similarly, there is a connection between effects of the draft plan on landscape and cultural heritage. For example, it is likely that enhancement (or deterioration) of landscape character will reflect in or contribute to positive (or negative effects) on cultural heritage and vice versa.

Mitigation actions and enhancement opportunities

Actions to mitigate the potential negative effects of the draft second cycle FRMP (mitigation actions) and opportunities to enhance the positive effects of the draft plan (enhancement opportunities) for each specific environmental topic, as well as key national processes that could contribute to mitigation or enhancement of these effects were identified through this SEA process. The mitigation actions for specific actions are summarised in the sections above describing the effects of the draft plan on each environmental topic.

Key national processes that could contribute to mitigation or enhancement of the environmental effects of the draft second cycle FRMP include:

- the Environment Agency's sustainable business strategy eMission 2030 including commitments to deliver Environmental and Biodiversity net gain across its operations, to achieve net zero carbon, optimising our use of resources and benefiting people and communities
- Environment Agency's ISO14001:2015 certified environmental management system providing independent assurance that the Environment Agency's approach to recognising and managing environmental issues will continue to deliver for the environment
- involving those with suitable experience and expertise in environmental and social issues (for example Natural England, Historic England, local authorities) in design and implementation of measures that are likely to have effects across the environmental topics to go beyond the flood risk targets set out in the FCERM strategy and also contribute to the objectives of other relevant strategies and policies such as the government's 25 Year Environment Plan, eMission 2030, the Environment Bill (when adopted)
- the Environment Agency has a track record of working with risk management authorities and partners to reduce flood risk and deliver a range of wider environmental and social benefits. To ensure the potential positive environmental effects of the draft FRMP are delivered the Environment Agency will need to continue to strengthen these relationships to deliver flood risk management in a sustainable way that reflects the global and local environmental, social, and economic threats and opportunities
- the Environment Agency has a rigorous and well-established approach to environmental assessment and management across its capital programme. Therefore it seems reasonable to conclude that for measures suggested in the draft FRMP managed by the agency many opportunities to enhance the environment and reduce anticipated negative effects should be realised
- the delivery of flood projects is subject to rigorous assurance, with levels of assurance increasing as the scale and value of the project increases

Negative effects of the draft second cycle FRMP are most likely to arise from proposed protecting measures if they involve construction, decommissioning, as well as excavating and, terrain shape and elevation modifications. When implementing these measures, the responsible authorities should implement key mitigation actions and enhancement opportunities including:

- adopt the mitigation hierarchy principle as a design principle during the development of these measures, with avoidance of areas of environmental sensitivity as far as possible

- implement sustainable construction (and decommission) practices (including construction waste disposal) to avoid or minimise the negative effects of construction activities on biodiversity, soil, water, climate, heritage and landscape
- consult relevant organisations (for example Historic England, local authorities, Natural England, Soil Association) and apply for any consents
- use sympathetic design and materials to maximise the potential enhancement opportunities of these measures, including for townscape and landscape character, climate regulation, habitat creation, recreation and tourism
- the development of plans and projects resulting from the measures in the draft FRMP should be the subject to lower tier assessments as appropriate to ensure the potential positive and negative environmental effects are considered in more detail, and appropriate mitigation actions and enhancement opportunities are identified
- at the construction stage, apart from the lowest risk projects, all projects will have an Environmental Management Plan produced to clearly identify the environmental risks present on site and the measures needed to mitigate and manage them. Where risks dictate, an environmental clerk of works may be employed to actively ensure the EMP is implemented. Where an environmental clerk of works is not needed the site manager is responsible for implementing the measures in the EMP
- wherever possible, adverse effects on heritage assets should be avoided. Designated assets must be preserved in situ. A programme of archaeological work will need to fully record and excavate the remains. The scope of the work would be agreed with and approved by the local authority archaeologist

Cumulative effects of the interactions between the draft plan and other relevant policies, plans and programmes

The interactions of the draft second cycle FRMP with other relevant existing or future policies, plans and programmes, proposals and strategies implemented within Humber RBD are likely to result in cumulative effects on the environmental topics across the RBD. Plans, strategies, and programmes within the Humber RBD that are likely to interact with the draft FRMP include:

- Humber Flood Risk Management Strategy ‘Planning for the Rising Tides’, published in 2008
- Hull lagoon infrastructure project
- the Northern Powerhouse proposal aims to improve economic growth in the north of England
- Humber Industrial Strategy (being developed by Humber Local Enterprise Partnership-LEP) aiming for green growth
- Humber RBMP
- 'Northern Forest' initiative
- environmental land management schemes (ELMS)
- resource plans of water companies produced every 5 years
- local development plans

It is likely that overall, the interactions between them and the draft FRMP will result in significant positive effect on population and human health as well as material assets as most relevant development plans target flood protection and resilience in combination with new infrastructure and economic growth.

The interactions between the draft second cycle FRMP and other (existing or proposed) development strategies and projects, including Humber Flood Risk Management Strategy**,** Hull lagoon infrastructure project, and Northern Powerhouse, could also result in significant negative cumulative effects on predominantly biodiversity, but also soil, and climate. Arising from the intense construction activities that are likely to carry on over several years, negative effects could include biodiversity decline, habitat fragmentation and loss, soil compactness and erosion, change in sediment flow, and carbon emissions including from construction site traffic.

However, the interactions between the development strategies and draft second cycle FRMP could also contribute to positive cumulative effects across environmental topics. For example, the Humber Flood Risk Management Strategy 'Planning for the Rising Tides' set out the Environment Agency's vision for managing tidal flood risk from the Humber Estuary in the face of climate change and sea level rise, considering the impacts this could have on people, industry and wildlife. Positive cumulative effects on climate could arise from interaction of the draft second cycle FRMP and future Humber LEP's industrial strategy aiming to support the region's ambition to achieve net zero carbon emissions by 2040.The Northern Forest initiative to plant 50 million trees around cities in the north of England, including Leeds, Sheffield, and Hull could lead to significant positive cumulative effects on biodiversity (like creating new or restoring habitats), soil (like decrease soil erosion and increase soil permeability), and climate (like increased carbon sequestration). The 'Countryside Stewardship' scheme offers financial incentives for farmers and land managers to look after their environment. It is likely to result in positive cumulative effects on soil and water quality and (consequently) biodiversity within the Humber RBD.

The interactions between the Humber RBMP and the draft second cycle FRMP are likely to result in positive cumulative effects on water including the marine environment. The RBMP sets out how organisations, stakeholders and communities will work together to improve the water environment as part of the Water Framework Directive. The third cycle of the plan is planned to be published in 2021. Water companies' 5-year resource plans and water company drainage and wastewater management plans are also likely to contribute to positive cumulative effects on water quality. These plans help deliver secure public water supplies, forecast supply and demand, and consider environmental challenges, such water quality and scarcity.

The RBMP, the 2008 Humber Flood Risk Management Strategy, and local development plans, also recognise the importance of planning for the changing climate. These strategies recognise that communities will need to adapt and become more resilient in the future.

Proposed monitoring

The SEA Regulations require significant environmental effects of the final FRMP to be monitored. This section outlines the actions we expect to take to monitor the significant environmental effects of the second cycle FRMP. Whilst it is feasible to monitor the significant effects of the second cycle FRMP, it will not be possible to determine whether any changes can be directly attributed to the second cycle FRMP. This is because there are too many other influences on environmental change for a direct relationship to be identified. Nevertheless, it is reasonable to monitor environmental changes to determine whether adaptations to the second cycle FRMP are needed. This might be needed to further reduce potential conflicts or make a greater contribution to achievement of environmental objectives.

The proposals make use of monitoring that is already undertaken or planned and reflects the effects identified as significant by the SEA process.

The environmental topics we are proposing to monitor are identified below. Although the SEA only concluded significant effects are likely on population and human health, given the uncertainty we have acknowledged in this report over the likely impacts of the plan on other environmental topics we are proposing to monitor a wider range of topics. In addition to the monitoring proposed below, the process of business case approval and assurance, associated with Flood and Coastal Risk Management Grant in Aid funding, will help to ensure management, mitigation and monitoring occurs at a project level.

Population and human health

The Environment Agency must periodically report to the minister about flood and coastal erosion risk management outcomes. Data on the changes in the number of households and businesses at risk of flooding and those better protected from flooding is already collected and would provide a good indicator for the effects of the plan. We recommend this data continues to highlight changes in flood risk for deprived communities as this will indicate whether more needs to be done to enable flood risk management to better support the levelling up agenda.

Strategic objective 1.1 of the National Flood and Coastal Erosion Risk Management Strategy for England action plan states that 'between now and 2050 the nation will bolster its resilience to flooding and coastal change' and outlines a number of actions to help deliver it. Monitoring conducted to understand how well this objective is achieved will also be relevant to understanding the extent to which second cycle FRMP resilience objectives and the respective benefits for people and human health are being achieved across RBDs.

Biodiversity, flora and fauna

Annual monitoring is already undertaken to determine the length of rivers improved to help show progress toward meeting Water Framework Directive objectives. Over the lifetime of the plan, we would expect to see the number of rivers reduce where flood risk management is a contributing factor in a rivers failure to achieve good status or potential. Furthermore, for Outcome Measure 4 (OM4) we report on:

- km of waterbody improved
- hectares of habitat improved
- hectares of habitat created

Additional monitoring associated with the implementation of biodiversity net gain (as set out in the 25 Year Environment Plan and included in the forthcoming Environment Bill might be expected and, where appropriate, these will be included as additional metrics.

Water

The Environment Agency undertakes monitoring of the water environment to meet the Water Environment Regulations. This monitoring shows overall changes in water quality, which the plan is unlikely to significantly alter. Annual monitoring is already undertaken to determine the length of rivers improved to help show progress toward meeting Water Framework Directive objectives. Indicators used include water quality. Over the lifetime of the plan, we would expect to see the number of rivers where flood risk management is a contributing factor to its poor status reduce.

Climatic factors

The second cycle FRMP includes measures that aim to help adapt to and increase resilience to climate change. General reporting and monitoring on implementation of these measures and their effectiveness will form a good indicator of progress here. Furthermore, under the Climate Change Act 2008 the Environment Agency must report to Defra on climate change adaptation. Elements of the report that are relevant to FRMP include:

- work with our customers and partners to adapt
- climate resilient investment
- building the evidence base

Tools and methods, such as carbon budgets, are being developed by the Environment Agency to manage the reduction of carbon emissions to contribute to the Environment Agency's ambition to be a net zero carbon organisation by 2030. While a significant number of local authorities have declared a climate emergency and might be expected to manage down their carbon emissions there is no consistent method of monitoring this. It is therefore likely the Environment Agency data will be used as an indicator of the performance of the wider programme.

Material assets and Cultural Heritage

Risk to property and infrastructure is currently covered under the general reporting requirements. This information should also be a reasonably good indicator to monitor the effects on cultural heritage. Much of the monitoring proposed for people and human health will also act as a good indicator for material assets. In particular data on the changes in the number of households and businesses at risk of flooding.

Soil

We propose that pressures on soil quality potentially occurring from the development of plans and projects resulting from the measures in the draft second cycle FRMP are monitored in accordance with the recommendations of lower tier assessments as appropriate.

Next steps

As the plan evolves, we'll consider any implications this might have for effects on the environment as part of our SEA requirements.

A statement of environmental particulars will be published alongside the final plan. This document will provide:

- a summary of how environmental considerations have been integrated into the final FRMP
- a summary of how consultation responses to the draft FRMP and environmental report have been considered
- a summary of how the final plan has changed since the draft FRMP
- what the above means in terms of changes to the environmental effects that were reported in the environmental report
- the reasons for choosing the final FRMP as adopted whilst considering reasonable alternatives
- the measures to be adopted to monitor the environmental effects of the FRMP

This consultation

Who we're consulting

We've prepared this environmental report to consult with interested parties, in particular the statutory SEA consultation bodies, on the results of the SEA process. In England the SEA consultation bodies are: Natural England, Historic England and the Environment Agency. We're also consulting with the Marine Management Organisation.

How we're communicating our results

We've published this non-technical summary alongside an environmental report and the draft second cycle FRMP for consultation.

The environmental report sets out the results of the SEA. It:

- provides information on the current condition of the environmental topics that the draft second cycle FRMP could affect
- outlines how the plans and programmes we've reviewed could affect the draft second cycle FRMP
- provides a commentary on how we've integrated the SEA with the development of the draft second cycle FRMP and how it's influenced it
- sets out the strategic options that we've evaluated and the reasons for the selection of the proposed approach
- sets out the environmental effects of the draft second cycle FRMP
- suggests additional mitigation or management actions to improve the environmental outcomes further
- provides a description of the monitoring proposed to identify any unforeseen adverse effects

This environmental report will be available for comment with the draft second cycle FRMP.

This non-technical summary provides an accessible summary of the information included within the environmental report.

We'll use any comments and information we've received to update the draft second cycle FRMP and reconsider our assessment of the environmental effects.

Once the plan's adopted, we'll publish a post-adoption statement (an advertisement), stating where the public can view the adopted plan and its environmental report. We'll also document an explanation of how the environment has been considered throughout the plan-making process in a statement of environmental particulars.

This will include:

- how environmental considerations have been integrated into the plan
- how the environmental report and consultation responses have been considered
- the reasons for choosing the plan as adopted considering other reasonable alternatives in the SEA
- the measures to be taken to monitor the significant environmental effects of implementing the plan

How to respond

Your views

To help with this consultation, we've set out some specific consultation questions below, which we would welcome your views on:

1. Do you agree with the conclusions of the environmental assessment? Yes or no.

If not, please explain why.

2. Are there any further significant environmental effects (positive or negative) of the draft second cycle FRMP, which you think should be considered? Yes or no.

If yes, please describe them.

3. Are there further mitigations for potential negative effects or opportunities to achieve positive effects that should be considered for the final second cycle FRMP? Yes or no.

If yes, please give details.

The consultation on this environmental report is open for 12 weeks, from 22 October 2021 to 21 January 2022.

You can view the consultation documents and questions online on the consultation pages.

Please submit your response online. This will help us gather and summarise responses quickly, accurately and cost-effectively.

However, if you prefer, you can submit your response by email or post using our response form. Please submit by email to: enquiries@environment-agency.gov.uk.

Or by post to:

Environment Agency
Draft second cycle flood risk management plans consultation
National Customer Contact Centre
PO Box 544
Rotherham
S60 1BY

You can also request a printed version of the document and a response form using these contact details or by phone to 03708 506 506.

Would you like to find out more about us or your environment?

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