National Flood and Coastal Erosion Risk Management Strategy for England:

Summary Report of Habitats Regulations Assessment Process

Date: 25 September 2020

We are the Environment Agency. We protect and improve the environment.

We help people and wildlife adapt to climate change and reduce its impacts, including flooding, drought, sea level rise and coastal erosion.

We improve the quality of our water, land and air by tackling pollution. We work with businesses to help them comply with environmental regulations. A healthy and diverse environment enhances people's lives and contributes to economic growth.

We can't do this alone. We work as part of the Defra group (Department for Environment, Food & Rural Affairs), with the rest of government, local councils, businesses, civil society groups and local communities to create a better place for people and wildlife.

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1. Introduction

1.1. The updated national Flood and Coastal Erosion Risk Management Strategy

1.1.1. Background

The Flood and Water Management Act 2010, requires the Environment Agency to develop, maintain, apply and monitor a Strategy for Flood and Coastal Erosion Risk Management (FCERM) in England.

The first national Strategy was published in May 2011. It provided the overarching framework for action by all risk management authorities (RMAs) to tackle all sources of flooding and coastal change. The Government committed in its 25 Year Environment Plan that the Environment Agency would revise the Strategy.

The Strategy has been developed collaboratively with over 90 organisations all of whom have inputted into its direction and ambitions since May 2017. This included a wide range of environmental organisations. A draft Strategy was also consulted on in May 2019. It received significant media coverage and over 400 responses which have informed the Strategy's final objectives and measures. The Strategy will replace the one published in 2011 and the next review of the Strategy is planned for 2026.

This report is a summary of the main Habitats Regulations Assessment (HRA) which provides further detail. A copy of the Main Habitats Regulation Assessment can be requested from FCERMstrategy@environment-agency.gov.uk. Both documents have been formulated to be appropriate for the non-spatial, high level nature of the strategy.

A Strategic Environmental Assessment (SEA) has also been carried out as part of the preparation of the Strategy with its findings set out in the SEA environmental report. The SEA has taken into account the findings of this HRA.

Throughout this HRA we refer to the 'Strategy', which should be read as a reference to the updated national FCERM Strategy for England.

1.1.2. Ambitions, strategic objectives and measures

The Strategy implements the requirements of Section 7 of the Flood and Water Management Act 2010, and sets out the national approach to flood and coastal erosion risk management

The 'vision' for this Flood and Coastal Erosion Risk Management Strategy is for a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100. The Strategy has three long term 'ambitions' underpinned by evidence about future risk and investment needs. They are:

- Climate resilient places
- Today’s growth and infrastructure resilient in tomorrow’s climate
- A nation ready to respond and adapt to flooding and coastal change

The focus of the Strategy is on the transformative long term 'objectives' over the next 10 to 30 years that support the Strategy's vision and ambitions up to 2100. This Strategy identifies shorter 'measures' as stepping stones to help make progress with the long term objectives in the coming years. These objectives and measures are set out in the Strategy.

The Strategy recognises the challenge of climate change (both mitigation and adaptation) and the significant increased risk of flooding and coastal change from a changing climate. Climate change will also affect European sites.

1.1.3. Need for Habitats Regulations Assessment

The Strategy is concerned with flooding and coastal change and not directly connected with, or necessary for, the nature conservation management of European sites.

The Strategy is a high-level document without a spatial basis or the capacity to directly affect European sites. However, the Strategy influences other plans and projects which have the potential to significantly affect European sites. Consequently, the Strategy is treated as a 'plan or project' subject to HRA.

The HRA needs to take a highly precautionary approach to the Strategy and so takes a worse case outlook. In practice the actual impact on European sites would need to be assessed through site specific HRAs for individual plans and projects taken forward.

1.2. Stages of Habitats Regulations Assessment

There are four potential stages to carrying out an HRA as summarised below.

1.2.1. Stage One: Screening

Screening identifies whether the Strategy is required for management of European sites. If it is not then the significance of potential impacts upon European site/s of the Strategy receives preliminary assessment to determine whether it is likely to significantly affect such sites.

It is vital to understand that the effects, and their causes, can take place outside of the European site boundary. The effect does not have to be apparent immediately, and it can occur as part of a chain of events.

Our interpretation is always precautionary meaning that if we have reasonable, scientific doubt that there might be an effect then we need to progress to stage two.

1.2.2. Stage Two: Appropriate Assessment

The Appropriate Assessment involves the consideration of the potential implications of the Strategy for European sites, taking account of their conservation objectives. The strategy may impact in synergy with other plans and projects, which then influences our conclusions.

The purpose of the Appropriate Assessment is to assess the effect on European sites' integrity. Where adverse impacts are identified, an assessment of the mitigation of those impacts is undertaken.

1.2.3. Stage Three: Assessment of feasible alternative solutions

If after the Appropriate Assessment we cannot be certain that the Strategy will not adversely affect the integrity of a European site, the next stage is to examine whether there are alternative ways of achieving the Strategy's objectives that better respect the integrity of the European site(s) affected.

1.2.4. Stage Four: IROPI test and consideration of Compensatory Measures

If no feasible alternative solutions exist then determination of whether the Strategy should proceed is by the test of imperative reasons of overriding public interest (IROPI). If there are imperative reasons of overriding public interest, meaning that the Strategy should go ahead despite the adverse effects, compensatory measures must be taken to ensure that the overall coherence of the network of European sites is protected.

2. Identification of European Sites

2.1. European sites that could be affected by the Strategy

2.1.1. Consideration of European sites at the higher strategic level

The Strategy does not specify where in England any measure it contains will be implemented. It is not spatially specific. Consequently, in theory and adopting the highly precautionary approach required by the Habitats Directive, there is the potential for the Strategy to affect European sites anywhere within England. The Strategy could also affect Scottish or Welsh European sites situated within trans-boundary catchments or with hydrological or other connectivity. Furthermore, it could also affect European sites in the UK's territorial waters, bar those far offshore. Taking a highly precautionary approach, in theory as many as 250 European sites could therefore be potentially affected by the Strategy. The designations are described in 2.3. These are collectively referred to as 'European sites' in this HRA.

The HRA needs to take a highly precautionary approach to the Strategy and so takes a worse case outlook. In practice the actual impact on European sites would need to be assessed through site specific HRAs for individual plans and projects taken forward.

2.2. European sites unlikely to be affected by the Strategy

The high-level nature of the Strategy and lack of a spatial framework, means few European sites can be completely ruled out as incapable of being potentially affected by the Strategy. However, we consider it is possible to rule out effects upon those European sites located a sufficient distance offshore to not be affected by coastal processes, at the tops of mountains and underground in terrestrial caves.

2.3. Qualifying interests of European sites

Further information about the European site features is available on the Joint Nature Conservation Committee website (www.jncc.gov.uk). Further details about the Ramsar sites are available on the Ramsar Convention website (http://www.ramsar.org). The HRA has not used this level of detail as part of the methodology, although we have checked this information for the purposes of our conclusions.

2.3.1. Special Protection Areas and potential Special Protection Areas Special Protection

Areas (SPAs) are protected sites classified for rare and vulnerable birds, and for regularly occurring migratory species. For the purposes of this HRA we have assumed that the needs of protected bird species will be provided for if the habitat conditions are met. In expanding the scope of the HRA beyond the site boundaries we assume that the most mobile species are likely to spend appreciable amounts of time outside of European sites, so requiring the appropriate habitat conditions for this.

The variety of different habitat types, range from areas of fen, peat or moorland, to coastal and estuarine habitat and marshland. In England, many of the SPAs are associated with marine/ coastal or estuarine waters and associated areas of marshland, with these classified areas covering a substantial proportion of England's estuarine and coastal areas. Although less extensive, there are also a number of inland terrestrial and freshwater SPAs, comprising areas of upland / moorland, heath, and inland water bodies and associated habitats. These can be either natural or artificial water bodies, such as gravel pits, reservoirs or washlands.

2.3.2. Special Areas of Conservation, candidate Special Areas of Conservation and Sites of Community Importance

In England, the reasons for designation, or qualifying interests of Special Areas of Conservation (SACs) and Sites of Community Importance (SCI) are varied, with a wide range of different habitats and species listed for each site's qualifying features and / or reasons for selection of the site. England's SACs include extensive areas of offshore, coastal and estuarine habitats as well as a diverse range of inland habitat types, upland and lowland, aquatic and terrestrial. Details of the SAC site descriptions including details of qualifying interest features can be viewed from the JNCC website (https://jncc.gov.uk/our-work/special-areas-of-conservation-overview/).

For the purposes of this HRA we have reviewed all the 77 habitat accounts on the JNCC website (referred to as the Annex 1 habitats) and selected those features that have the capacity to be potentially affected by the Strategy.

2.3.3. Ramsar sites

The designation of Ramsar sites is guided by criteria set out in the Ramsar Convention. Of particular relevance are: a site regularly supporting 20,000 or more waterbirds; and a site regularly supporting 1% of the individuals in a population of one species or subspecies of water bird. Further details and the full list of criteria for designation of Ramsar sites can be viewed on Natural England's website (https://jncc.gov.uk/our-work/ramsar-sites).

Ramsar sites can comprise areas of marsh, fen, peatland or areas of water that are static or flowing, fresh, brackish or areas of marine water. Ramsar sites may also incorporate riparian (banks of a river, pond or watercourse) and coastal zones adjacent to the

wetlands. In England, many of the Ramsar sites are associated with marine/ coastal or estuarine waters and associated areas of marshland, with these designated areas covering a substantial proportion of England's estuarine and coastal areas. Although less extensive, there are also a number of inland and freshwater Ramsar sites, associated with river valleys and floodplains, heathland or fens, and also includes artificial water bodies and associated habitats such as gravel pits, reservoirs or washlands.

2.4. Conservation objectives for European sites

All European sites have conservation objectives. The conservation objectives aim to maintain or achieve 'favourable conservation status'. Any proposals that are likely to affect the conservation objectives of a European site are therefore also likely to affect the overall integrity of the site.

Information on status, condition and conservation objectives for European sites is available from Natural England (www.naturalengland.org.uk). Conservation objectives for Welsh sites can be accessed from: https://naturalresources.wales/?lang=en and for Scottish sites from www.nature.scot.

2.5. The wider countryside and marine environment

The HRA assesses the impacts on European site integrity of FCERM activities in the wider countryside and marine environment outside of the European site boundaries. There are several reasons why this is essential, including:

- the integrity of European sites is dependent upon interactions with the wider countryside, including hydrology, water quality, air quality, disturbance, marine processes, etc.
- species movement and interaction with the wider countryside
- the boundaries of European sites could change in the future, including a rolling review of the boundaries of fluvial SACs reflecting natural geomorphological changes, and extensions to boundaries based on ecological functional units

European sites are the most important wildlife sites in England, located within landscapes that have suffered massive loss and fragmentation. Natural England and the Environment Agency recognise that European sites should form the 'backbone' of a larger, functionally connected network, acting as resilient core areas that will retain large and stable species populations and enable movement into and colonisation of surrounding landscapes. The HRA has incorporated this concept of European site and species functionality into the assessment methodology.

2.6. Theme Plans

Theme Plans explain how Natural England and partner organisations, including the Environment Agency, plan to deal with complex priority issues which affect multiple European sites. Theme Plans have been prepared for the following cross-cutting pressures:

- atmospheric nitrogen
- climate change
- coastal management
- diffuse water pollution
- grazing
- habitat fragmentation
- hydrological functioning
- invasive species
- lake restoration
- public access and disturbance
- river restoration

In formulating the HRA we have relied extensively on the Theme Plans and the Marine Conservation Advice Packages.

2.7. Climate change

Adapting to climate change is a key theme of the Strategy. There is strong evidence that biodiversity in the UK is being affected by climate change and the impacts are expected to increase as the magnitude of climate change increases. The HRA has used the Climate Change Theme Plan principles in a non-site and species specific way by applying them to habitats and the changes to European site integrity that are possible following the implementation of the Strategy.

2.8. Integrity and favourable condition status (FCS)

The integrity of a European site refers to the lasting coherence of its ecological structure and function across its whole area in relation to the habitats and/or populations of species (collectively referred to as the Qualifying Features) for which the site was designated. The legislation requires that the integrity of sites is maintained or restored as appropriate, and that European sites contribute to achieving the Favourable Conservation Status (FCS) of the habitats and species for which they have been designated - their 'Qualifying Features'.

Conservation status of a natural habitat means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species.

The conservation status of a natural habitat will be taken to be ‘favourable’ when:

- its natural range and areas it covers within that range are stable or increasing,
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future,
- the conservation status of its typical species is favourable as defined below;
- The conservation status of a species will be taken to be ‘favourable’ when:
- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats,
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future,
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis

3. Habitats Regulations Assessment: stage 1 screening

3.1. Screening introduction

The ‘screening’ stage is a filter intended to identify which proposed plans or projects require further assessment. The strategy has been screened as requiring appropriate assessment. This is because:

- it is a plan
- it is not directly connected with or necessary to the management of any European site; and
- we cannot be certain that it is not likely to have a significant effect on any European site(s), either alone or in combination with other plans or projects

We have screen all measures within the Strategy and considered whether there is a logical link to actions on the ground. We have assembled these measures into groups in order to create a manageable number on which to apply the assessment. Their groupings relate to their probable modes of impact on the European sites (see section 4.1.1 below). We have screened in all measures with the exception of: continuing professional development for FCERM professionals and improved stakeholder awareness. Both of these measure types have limited capacity to influence the Strategy's potential impact on any European sites.

3.2. Conclusion

We have screened in all measures with the exception of: continuing professional development for FCERM professionals and improved stakeholder awareness.

For the remaining measures we cannot determine, with the requisite degree of certainty required by the Habitats Directive, that they are not likely to significantly affect any European sites, whether alone or in combination with other plans or projects.

Consequently, an appropriate assessment of the implications of these aspects of strategy for European sites must be undertaken. This is set out in section 4, the appropriate assessment.

4. Habitats Regulations Assessment: stage 2 appropriate assessment

4.1. Introduction

We have undertaken appropriate assessment of all those measures not screened out at stage 1. We have done so proportionate to the high level, non-spatial nature of the Strategy and taking account of the considerable unknowns over how and where the Strategy's effects may be felt in relation to European sites.

This section summarises how we have undertaken our assessment and sets out our conclusions of appropriate assessment.

4.1.1. Method for assessing the measures of the strategy

The Strategy covers the whole of England and could in theory have effects upon European sites beyond via trans-boundary catchments, or species movement, with Scotland and Wales. In theory, there are therefore more than 250 European sites ('receptors') that could potentially be affected by one or more of the measures screened in for assessment.

Consequently, so that our assessment can be manageable and reportable, we have undertaken appropriate assessment based upon the integrity of the Annex 1 habitats. Applying the highly precautionary approach required by the Habitats Directive, we have based our assessment on a worst case scenario.

4.1.2. Characterising the European sites

There are inherent difficulties and unknowns in carrying out an appropriate assessment for a high level plan such as the Strategy. The Strategy is a national Strategy and is not spatially specific, therefore the locations where its measures may influence lower-tier plans, strategies and actions cannot be identified at this stage. As a result, it is not possible to provide detailed consideration of the potential effects of the Strategy's measures upon the integrity of any particular European site with respect to the site's structure, function and conservation objectives.

However, European sites potentially affected by the Strategy are each designated for 'qualifying features' which could comprise one or more of 77 'Annex 1' habitat types (European protected habitats), one or more of 38 'Annex 2' species and/or one or more bird populations of national significance (together, European protected species). The 'integrity' of a European site is also determined by reference to the lasting preservation of such qualifying features.

We therefore adopted an approach of assessing the potential implications of the Strategy for European sites based upon the habitat accounts for all 77 Annex 1 habitat types. By

considering the potential implications of the Strategy upon protected habitats of importance to the conservation of Annex 2 species and birds, we also took account of these species through our appropriate assessment.

4.2. Assessment

The following matrix, presented in Table 1a and 1b below, identifies potential FCERM activities that could in theory adversely affect the qualifying features of European sites, and therefore potentially result in an adverse impact on site integrity.

The Appropriate Assessment has taken this a stage further by assessing these impacts (Impact types A-J in Table 1a and 1b) more specifically against the (grouped) qualifying habitats and species features of the European sites (see Table 2a, 2b, 2c, 2d, 2e and 2f below).

Table 1a: Summary of FCERM related activities and some of their potential impact types (A to G).

FCERM related activities	A. Habitat loss	B. Changes in physical regime	C. Physical damage	D. Changes in turbidity	E. Habitat and community simplification	F. Disturbance (noise, visual presence)	G. Competition from non-native species
In-channel works and structures	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sea defence works and maintenance	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bridgeworks	Yes	Yes	Yes	Yes	Yes	Yes	No
Culverts	Yes	Yes	Yes	No	Yes	Yes	No
Channel diversions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
High-level bypass channels and flood swales	Yes	Yes	Yes	Yes	Yes	No	No
Access tracks and spoil disposal	Yes	No	Yes	Yes	Yes	Yes	Yes
Construction of floodbanks	Yes	Yes	Yes	No	Yes	Yes	Yes
Maintenance of floodbanks	Yes	No	Yes	No	Yes	Yes	Yes
Construction phase activities	No	No	Yes	Yes	No	Yes	No
Weed cutting operations	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Herbicide applications	Yes	No	Yes	No	Yes	Yes	No
Bank flailing and mowing regimes	Yes	No	Yes	No	Yes	Yes	Yes
Bank works (such as reprofiling)	Yes	Yes	Yes	Yes	Yes	Yes	No
Channel dredging and regradings	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Shoal and gravel removal	Yes	Yes	Yes	Yes	Yes	Yes	No
Tree management works	Yes	Yes	Yes	No	Yes	Yes	No
Shingle recycling and reprofiling	Yes	Yes	Yes	Yes	Yes	Yes	No
Beach maintenance	Yes	Yes	No	No	Yes	Yes	No
Erosion protection	Yes	Yes	Yes	Yes	Yes	Yes	No
Flood gates and barriers	Yes	Yes	Yes	Yes	Yes	Yes	No
River restoration	No	Yes	No	Yes	No	Yes	No
Sand dune management	Yes	Yes	Yes	No	Yes	Yes	No
Tree planting	Yes	Yes	No	Yes	Yes	No	No
SUDs	No	Yes	No	Yes	No	No	No

FCERM related activities	A. Habitat loss	B. Changes in physical regime	C. Physical damage	D. Changes in turbidity	E. Habitat and community simplification	F. Disturbance (noise, visual presence)	G. Competition from non-native species
Leaky dams	No	Yes	No	Yes	No	No	No
Demountable defences	No	Yes	Yes	No	No	Yes	No
Pumping stations and pump operation	No	Yes	Yes	Yes	No	Yes	No
Washlands	No	Yes	No	Yes	No	No	No
Flood storage reservoirs	Yes	Yes	Yes	No	No	Yes	No
Surface water outfalls	Yes	Yes	No	Yes	No	Yes	No
Removal of flood defence asset	No	Yes	No	Yes	No	No	No
Relocation of property from flood risk area	No	Yes	No	Yes	No	Yes	Yes
Soil management	No	Yes	No	Yes	No	No	No
Coastal erosion protection and stabilization	No	Yes	Yes	Yes	Yes	Yes	No
Flooding	No	Yes	Yes	Yes	No	No	No

Table 1b: Summary of FCERM related activities and some of their potential impact types (H to M).

FCERM related activities	H. Changes to flow and velocity regime and improved draining	I. Reduced surface water flooding	J. Changes to water chemistry	K. increased surface water flooding	L. increased habitat fragmentation	M. decreased climate change resilience
In-channel works and structures	Yes	Yes	Yes	No	Yes	Yes
Sea defence works and maintenance	Yes	Yes	No	No	Yes	Yes
Bridgeworks	No	No	No	No	No	No
Culverts	Yes	Yes	No	No	Yes	Yes
Channel diversions	Yes	Yes	No	No	Yes	Yes
High-level bypass channels and flood swales	Yes	Yes	Yes	No	No	No
Access tracks and spoil disposal	No	No	No	No	Yes	Yes
Construction of floodbanks	Yes	Yes	No	No	Yes	Yes
Maintenance of floodbanks	No	Yes	No	No	Yes	Yes
Construction phase activities	Yes	No	Yes	No	Yes	Yes
Weed cutting operations	Yes	Yes	Yes	No	Yes	Yes
Herbicide applications	Yes	Yes	Yes	No	Yes	Yes
Bank flailing and mowing regimes	Yes	Yes	Yes	No	Yes	Yes
Bank works (such as reprofiling)	Yes	Yes	No	No	Yes	Yes
Channel dredging and regradings	Yes	Yes	Yes	No	Yes	Yes
Shoal and gravel removal	Yes	Yes	Yes	No	Yes	Yes
Tree management works	No	No	Yes	No	Yes	Yes
Shingle recycling and reprofiling	Yes	Yes	No	No	Yes	Yes
Beach maintenance	No	No	No	No	Yes	Yes
Erosion protection	Yes	No	Yes	No	Yes	Yes
Flood gates and barriers	Yes	Yes	Yes	No	Yes	Yes
River restoration	Yes	Yes	Yes	No	No	No

FCERM related activities	H. Changes to flow and velocity regime and improved draining	I. Reduced surface water flooding	J. Changes to water chemistry	K. increased surface water flooding	L. increased habitat fragmentation	M. decreased climate change resilience
Sand dune management	Yes	Yes	No	No	Yes	Yes
Tree planting	Yes	Yes	Yes	No	Yes	Yes
SUDs	Yes	Yes	Yes	No	Yes	No
Leaky dams	Yes	No	Yes	Yes	Yes	No
Demountable defences	Yes	Yes	No	No	Yes	No
Pumping stations and pump operation	Yes	Yes	Yes	Yes	Yes	Yes
Washlands	Yes	No	Yes	Yes	Yes	Yes
Flood storage reservoirs	Yes	No	Yes	Yes	Yes	Yes
Surface water outfalls	Yes	Yes	Yes	No	Yes	Yes
Removal of flood defence asset	Yes	No	Yes	Yes	Yes	Yes
Relocation of property from flood risk area	Yes	No	Yes	Yes	Yes	Yes
Soil management	Yes	No	Yes	No	No	No
Coastal erosion protection and stabilization	No	No	No	No	Yes	Yes
Flooding	Yes	No	Yes	Yes	Yes	Yes

Table 2a: Generic impact types (A to G) arising from FCERM activities on European SAC/Ramsar habitat groups.

All the habitat groups are a priority habitat, except 1.3 riverine habitats.

SAC/Ramsar habitat groups	A. Habitat loss	B. Changes in physical regime	C. Physical damage	D. Turbidity	E. Habitat and community simplification	F. Disturbance (noise, visual presence)	G. Competition from non-native species
1.1 Fens and wet habitats not acidification sensitive	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1.2 Bogs and wet habitats, acidification sensitive	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1.3 Riverine habitats	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1.4 Standing waters acidification sensitive	Yes	No	Yes	No	Yes	Yes	Yes
1.5 Standing waters not acidification sensitive	Yes	No	Yes	No	Yes	Yes	Yes
1.6 Dry woodlands	Yes	No	Yes	No	Yes	Yes	Yes
1.7 Dry grassland	Yes	Yes	Yes	No	Yes	Yes	Yes
1.8 Dry heathland habitats	Yes	No	Yes	No	Yes	Yes	Yes
1.9 Upland	Yes	No	Yes	No	Yes	Yes	Yes
1.10 Coastal habitats	Yes	Yes	Yes	No	Yes	Yes	Yes
1.11 Coastal habitats sensitive to abstraction	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1.12 Estuarine and intertidal habitats	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1.13 Submerged marine habitats	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 2b: Generic impact types (H to M) arising from FCERM activities on European SAC/Ramsar habitat groups.

All the habitat groups are a priority habitat, except 1.3 riverine habitats.

SAC/Ramsar habitat groups	H. Changes to flow and velocity regime and improved draining	I. Reduced surface water flooding	J. Changes to water chemistry	K. increased surface water flooding	L. increased habitat fragmentation	M. Reduced resilience to climate change
1.1 Fens and wet habitats not acidification sensitive	Yes	Yes	Yes	No	Yes	Yes
1.2 Bogs and wet habitats, acidification sensitive	Yes	Yes	Yes	No	Yes	Yes
1.3 Riverine habitats	Yes	Yes	Yes	No	Yes	Yes
1.4 Standing waters acidification sensitive	Yes	No	Yes	No	Yes	Yes
1.5 Standing waters not acidification sensitive	Yes	No	Yes	No	Yes	Yes
1.6 Dry woodlands	No	No	No	Yes	Yes	Yes
1.7 Dry grassland	Yes	No	No	Yes	Yes	Yes
1.8 Dry heathland habitats	No	No	No	Yes	Yes	Yes
1.9 Upland	Yes	No	Yes	Yes	Yes	Yes
1.10 Coastal habitats	No	Yes	Yes	Yes	Yes	Yes
1.11 Coastal habitats sensitive to abstraction	Yes	Yes	Yes	Yes	Yes	Yes
1.12 Estuarine and intertidal habitats	Yes	No	Yes	Yes	Yes	Yes
1.13 Submerged marine habitats	Yes	No	Yes	No	Yes	Yes

Table 2c: Generic impact types (A to G) arising from FCERM activities on European SAC / Ramsar species groups.

Species group 2.4 liverworts – western rustwort is a priority species.

SAC / Ramsar species groups	A. Habitat loss	B. Changes in physical regime	C. Physical damage	D. Changes in turbidity	E. Habitat and community simplification	F. Disturbance (noise, visual presence)	G. Competition from non-native species
2.1 Vascular plants in aquatic habitats	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2.2 Vascular plants, lower plants and invertebrates, wet habitats	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2.3 Vascular plants, grassland	Yes	No	Yes	No	Yes	Yes	Yes
2.4 Liverworts – Western rustwort	Yes	No	Yes	No	Yes	Yes	Yes
2.5 Anadromous fish	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2.6 Non-migratory fish and invertebrates in rivers	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2.7 Invertebrates in wooded habitats	Yes	No	Yes	No	Yes	Yes	Yes
2.8 Mammals in wooded habitats	Yes	No	Yes	No	Yes	Yes	Yes
2.9 Mammals in riverine habitats	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2.10 Amphibians	Yes	Yes	Yes	No	Yes	Yes	Yes
2.11 Coastal plants	Yes	Yes	Yes	No	Yes	Yes	Yes
2.12 Marine mammals	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 2d: Generic impact types (H to M) arising from FCERM activities on European SAC / Ramsar species groups.

Species group 2.4 liverworts – western rustwort is a priority species.

SAC / Ramsar species groups	H. Changes to flow and velocity regime and improved draining	I. Reduced surface water flooding	J. Changes to water chemistry	K. increased surface water flooding	L. increased habitat fragmentation	M. Reduced resilience to climate change
2.1 Vascular plants in aquatic habitats	Yes	No	Yes	Yes	Yes	Yes
2.2 Vascular plants, lower plants and invertebrates, wet habitats	Yes	Yes	Yes	Yes	Yes	Yes
2.3 Vascular plants, grassland	No	No	No	Yes	Yes	Yes
2.4 Liverworts – Western rustwort	No	No	No	No	Yes	Yes
2.5 Anadromous fish	Yes	No	Yes	Yes	Yes	Yes
2.6 Non-migratory fish and invertebrates in rivers	Yes	Yes	Yes	Yes	Yes	Yes
2.7 Invertebrates in wooded habitats	No	No	No	No	Yes	Yes
2.8 Mammals in wooded habitats	No	No	No	No	Yes	Yes
2.9 Mammals in riverine habitats	Yes	No	Yes	No	Yes	Yes
2.10 Amphibians	Yes	Yes	Yes	No	Yes	Yes
2.11 Coastal plants	Yes	Yes	No	Yes	Yes	Yes
2.12 Marine mammals	No	No	Yes	No	Yes	Yes

Table 2e: Generic impact types (A to G) arising from FCERM activities on European SPA / Ramsar bird species groups.

SPA / Ramsar bird species groups	A. Habitat loss	B. Changes in physical regime	C. Physical damage	D. Turbidity	E. Habitat and community simplification	F. Disturbance (noise, visual presence)	G. Competition from non-native species
3.1 Birds in uplands	Yes	Yes	Yes	No	Yes	Yes	Yes
3.2 Birds in woodland & scrub	Yes	Yes	Yes	No	Yes	Yes	Yes
3.3 Birds in lowland heaths & brecks	Yes	Yes	Yes	No	Yes	Yes	Yes
3.4 Birds in lowland wet grassland	Yes	Yes	Yes	No	Yes	Yes	Yes
3.5 Birds in lowland dry grassland	Yes	No	Yes	No	Yes	Yes	Yes
3.6 Birds in lowland freshwaters and their margins	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3.7 Farmland Birds	Yes	No	Yes	No	Yes	Yes	Yes
3.8 Birds in coastal habitats	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3.9 Birds in estuarine habitats	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3.10 Birds in open sea and offshore rock	Yes	No	Yes	Yes	Yes	Yes	Yes

Table 2f: Generic impact types (H to M) arising from FCERM activities on European SPA / Ramsar bird species groups.

SPA / Ramsar bird species groups	H. Changes to flow and velocity regime and improved draining	I. Reduced surface water flooding	J. Changes to water chemistry	K. increased surface water flooding	L. increased habitat fragmentation	M. Reduced resilience to climate change
3.1 Birds in uplands	No	Yes	No	Yes	Yes	Yes
3.2 Birds in woodland & scrub	No	No	No	No	Yes	Yes
3.3 Birds in lowland heaths & brecks	No	No	No	Yes	Yes	Yes
3.4 Birds in lowland wet grassland	Yes	Yes	No	Yes	Yes	Yes
3.5 Birds in lowland dry grassland	No	No	No	Yes	Yes	Yes
3.6 Birds in lowland freshwaters and their margins	Yes	Yes	Yes	Yes	Yes	Yes
3.7 Farmland Birds	No	Yes	No	Yes	Yes	Yes
3.8 Birds in coastal habitats	Yes	No	Yes	Yes	Yes	Yes
3.9 Birds in estuarine habitats	Yes	Yes	Yes	Yes	Yes	Yes
3.10 Birds in open sea and offshore rock	No	No	No	No	Yes	Yes

Tables 1a, 1b, 2a, 2b, 2c, 2d, 2e, and 2f demonstrate that many FCERM activities are capable of adversely affecting Annex 1 habitats, through a range of generic impact types. These FCERM activities will be influenced by the Strategy and its measures.

The Strategy is a high-level document without a spatial basis or the capacity to directly affect European sites. The HRA needs to take a highly precautionary approach so takes a worse case outlook. This means few European sites can be completely ruled out as incapable of being potentially affected by the Strategy.

In practice the actual impact on designated sites would need to be assessed through lower level strategies, plans, projects and activities later in the planning and implementation process. This highlights the importance of a tiered approach to Habitats Regulations Assessment. More detailed assessment of the FCERM impacts on a European site or sites, and appropriate site-specific mitigation to address it, can be developed in the most effective manner at lower levels of FCERM planning.

Tables 1a, 1b, 2a, 2b, 2c, 2d, 2e, and 2f are based on tables from: Environment Agency Operational Instruction 53_02. Using the Habitats Directive handbook for flood and coastal risk management permissions, plans and projects. Environment Agency, April 2012. The tables are not comprehensive and are based on the judgement of staff in the Environment Agency, Natural England and CCW. There may be other hazards and sensitivities, which will vary according to circumstances.

4.3. Assessment of potential in combination effects

We have assessed the Strategy's potential to affect European sites in combination with other plans or projects. For the purpose of this assessment, and in keeping with the high-level, non-spatial nature of the Strategy, only key relevant high-level plans that could potentially result in in-combination effects have been considered.

At this national scale, it is not possible to provide an extensive list of all plans and projects which may lead to in-combination effects together with the strategy. These will, however, need to be considered further where HRA is required at subsequent stages in the implementation of the strategy. The key high level plans considered are summarised below.

4.3.1. A Green Future: Our 25 Year Plan to Improve the Environment

The Defra 25 Year Environment Plan sets out the Government's ambition for environmental policy over the next 25 years or so. It includes ambitions to reduce the risk of harm to people, the environment and the economy from natural hazards including flooding, drought and coastal erosion.

The Strategy has been prepared to support these aims of the 25 Year Environment Plan. There are, however, many other objectives within the plan which may interact with European sites, therefore in combination effects cannot be ruled out.

4.3.2. The UK's Industrial Strategy

The UK Industrial Strategy sets out the Government's approach to boosting productivity across the country, raising living standards and improving the quality of life for citizens. This strategy includes objectives to boost innovation and employment including 'driving a major upgrade to the UK's infrastructure'.

There is potential for projects which result from the Industrial Strategy to impact on European sites, which could lead to in combination effects when combined with actions resulting from the strategy. In many cases such potential in combination effects will require further consideration in HRAs undertaken at local strategy and project levels.

4.3.3. The UK Marine Policy Statement (MPS)

This implements the requirements of the Marine and Coastal Access Act 2009, and sets out a framework for a system of marine planning for the UK marine area.

Given that the Marine Policy Statement (MPS) is focused on the marine and coastal areas, it is considered unlikely to result in any in combination effects on any of the English inland and non-marine European sites. However, the MPS itself has undergone HRA, the conclusions of which were that it was unable to exclude the possibility that the integrity of one or more European sites could be adversely affected by activities identified in the MPS, either alongside or in-combination with other plans or projects. However the HRA of the MPS did not include FCERM in the list of activities capable of impacting the coastal and marine environment. This HRA has concluded that FCERM may have significant effect on the marine and coastal environment, as also evidenced in the Coastal Management

Theme Plan. The potential for in-combination effects between the Strategy and the MPS in the marine environment cannot therefore be completely ruled out.

4.3.4. Shoreline Management Plans (SMPs)

Shoreline Management Plans (SMPs) are the regional strategic plans that will support and help to achieve the objectives of the strategy in the coastal context. They set out the priorities and strategic direction for all flood and coastal erosion risk management on the coast. SMPs have a geographic framework set out according to an area of coastline known as a sub-cell within a littoral sediment cell (length of coastline that is relatively self-contained in terms of the movement of sediment).

Rather than result in 'in combination' effects with the strategy, the SMPs represent the lower-tier, spatially-based plans, which will support and implement many of the objectives of the strategy. The SMPs are due to be refreshed under strategy measure 2.4.2.

Therefore their potential adverse effects upon the integrity of European sites has already been assessed as part of the Appropriate Assessment.

The majority of these plans will also include their own HRAs which will be better able to define the likely impacts of the plans, alone and in combination with other relevant local plans, on particular European sites and their conservation objectives.

4.3.5. Catchment Flood Management Plans (CFMPs)

The Environment Agency has produced a Catchment Flood Management Plan (CFMP) for each of the 68 main catchments in England. They consider inland flood risk from rivers, surface water, groundwater and tidal flooding, and are designed to set the overall direction of flood risk management on a catchment basis. They identify broad flood risk management policies that are economically practical, have a potential life of 50 to 100 years, and will help the Environment Agency work with others to put them in place.

Rather than result in 'in combination' effects with the Strategy, CFMPs are the regional strategic plans that will, amongst other lower-tier plans and strategies, support and help to achieve the objectives of the Strategy.

The majority of these plans include their own HRAs which will be better able to define the likely significant effects of the plans, alone and in combination with other relevant local plans, on particular European sites and their conservation objectives.

4.3.6. River Basin Management Plans (RBMPs)

River Basin Management Plans (RBMPs) deliver the objectives of the Water Framework Directive (WFD), namely to deliver good status for all water bodies. Designated European sites (water-dependant SACs and SPAs) are specifically referenced within the WFD and the RBMPs, referred to as 'Protected Areas', and have their own specific set of objectives and actions to deliver them.

Given that RBMPs include targets and objectives for achieving 'favourable conservation status' for water-dependant European sites, the potential in combination effects between the RBMPs and the strategy should predominantly result in beneficial effects. However, the RBMPs also include different objectives for a range of different water bodies, which could conflict with protection of European sites. Potential in combination effects with the Strategy cannot therefore be completely ruled out.

4.3.7. Flood Risk Management Plans (FRMPs)

Flood Risk Management Plans (FRMPs) are produced every 6 years. They:

- describe the sources and risks of flooding in a river basin district (RBD) and catchment
- include information on how risk management authorities (RMAs) plan to work with communities and businesses to manage and reduce flood risk

FRMPs and river basin management plans (RBMPs) help all those involved in managing water to make decisions that are best for people and the environment. The second round of FRMPs are due in 2021 and will contribute towards implementing the strategy.

Consequently, rather than result in ‘in combination’ effects with the Strategy, FRMPs are regional strategic plans that will, amongst other lower-tier plans and strategies, support and help to achieve the objectives of the Strategy.

The majority of these plans include their own HRAs which will be better able to define the likely significant effects of the plans, alone and in combination with other relevant local plans, on particular European sites and their conservation objectives.

4.3.8. The Strategy as a whole

We are also required to assess the Strategy as a whole, so have undertaken a high level in combination assessment of all the ‘measures’ assessed individually above.

The Strategy contains a mix of measures, some of which focus on 'how' the Strategy is to be implemented, and others which direct 'what' is to be done. Many combine the two.

Many of the measures complement each other and/or could influence the same types of FCERM activities. None of the measures combine to increase the risk of damage to the integrity of European sites.

4.4. Avoidance and mitigation of impacts

4.4.1. In Strategy mitigation

A number of measures and other features of the Strategy mitigate the potential for adverse effects upon European sites identified through appropriate assessment.

All RMAs in carrying out their FCERM functions must act in a manner which is consistent with the Strategy as a whole, including its mitigating features. Consequently, when implementing measures that we consider could adversely affect European sites, all RMAs must also implement the mitigation measures contained in the Strategy.

Some measures are looking to not only mitigate environmental impacts but enhance the natural environment aligned with the Government's 25 Year Environment Plan.

There are many measures that are intended to protect or enhance the natural environment, and so will reduce the potential of the Strategy to adversely affect the integrity of European sites. These are outlined in the Strategy in more detail.

These are:

- 1.4.1 - From 2020 risk management authorities and Natural England will jointly develop new approaches for the conservation of protected sites, species and natural landscapes that enable adaptation to sea level rise and a changing climate
- 1.4.2 - From 2021 risk management authorities will work with catchment partnerships, coastal groups, land managers and communities to mainstream the use of nature based solutions
- 1.4.3 - From 2021 risk management authorities will contribute to improving the natural, built and historic environment by investing in projects that manage flood and coastal risks where this is appropriate
- 1.4.4 - From 2021 investments in flood and coastal projects by risk management authorities will help to achieve objectives in river basin management plans and contribute to the government's aim for 75% of waters to be close to their natural state as soon as practicable
- 1.4.5 - From 2021 risk management authorities will work with Natural England and other partners as they develop Local Nature Recovery Strategies that enable new and restored habitats to contribute to flood and coastal resilience
- 2.2.1 - From 2021 risk management authorities will plan all flood and coastal defence projects and programmes to deliver biodiversity gain, in line with the government's mandate, and seek to encourage other environmental benefits
- 2.2.2 - From 2021 risk management authorities will work with developers and planners to maximise the opportunities for flood and coastal resilience as part of contributing to environmental net gain for development proposals

These, in combination with other measures, are intended to achieve that FCERM activities are undertaken sympathetically to wider environmental goals and will help ensure that on a case by case basis adverse effects, especially to protected habitats such as European sites are avoided as far as possible.

4.4.2. Lower-tier mitigation

Site-specific mitigation can be anticipated as lower tier plans, strategies and projects seek to implement the Strategy's objectives and measures. Such mitigation can be tailored to the potential impacts that may arise from such lower-tier plans, strategies and projects.

This is supported at the higher-tier level of the Strategy by the generic requirements set out above.

Further, wherever required, lower-tier plans, strategies and projects will be subject to their own HRAs. Such HRAs will ensure that these activities do not proceed unless they do not adversely affect the integrity of European sites or else, exceptionally, imperative reasons of overriding public interest exist for proceeding. This further layer of protection for European sites is also supported by the explicit requirements in the Strategy that RMAs comply with environmental legislation, including that on habitats and wildlife, and that they should aim to minimise damage to, and improve, the natural environment.

4.4.3. Specific mitigation recommendations

The appropriate assessment cannot rule out that the Strategy may potentially give rise to adverse effects on the integrity of European sites. However, this potential can be further reduced by specific mitigation and measures in the Strategy. These can derive from the following sources:

- other Strategy measures or Strategy text that already provides adequate mitigation (see section 4.4.1 above)
- mitigation arising beyond the Strategy process, through existing steps (eg guidance and best practices) and at later tiers of planning or projects, through site specific HRAs where it is more appropriate to do so.
- amendments to specific measures and/or strategy text, eg additions to text describing how our place based approach to resilience will also take account of environmental resilience

4.5. Conclusions of the appropriate assessment

At this national strategic level, it is not possible to predict, describe or assess the specific impacts associated with the different activities, plans and strategies that will result from the Strategy on the integrity of a particular European site, with respect to the site's structure, function and conservation objectives. The appropriate assessment therefore identifies FCERM activities that may give rise to types of impacts on European site qualifying features (habitats and species). Such impacts may potentially impact the integrity of European sites. In light of this, the appropriate assessment has considered the potential effects of those measures that were screened in for assessment on all Annex 1 habitats and Annex 2 species/birds.

We cannot be certain that a number of the measures would not, alone or in combination, prejudice the lasting preservation of such habitats and species and so result in adverse effects upon the integrity of European sites.

However, the Strategy incorporates a number of measures and text that help mitigate the effects on designated sites. Furthermore, the Strategy has measures that are not only looking to mitigate environmental impacts but enhance the natural environment, aligned with the Government's 25 Year Environment Plan.

The HRA has also considered other factors which are in place or which we can be sure are capable of implementation beyond the Strategy itself which will help mitigate the

Strategy's potential for adverse effects on European site integrity. These include measures implemented within the lower-tier strategies, plans and projects to help avoid potential impacts on European site integrity.

These mitigation measures are considered likely to substantially reduce the potential for the strategy to adversely affect the integrity of European sites. However, despite the

implementation of mitigation, it is not possible to be certain that there will not remain the possibility of some adverse effects upon the integrity of one or more European sites arising from the implementation of the strategy.

The HRA must therefore proceed to stage 3 and the consideration of alternatives.

5. Habitats Regulations Assessment: stage 3 assessment of alternatives

The Habitats Regulations require that the competent authority is satisfied that there are no alternative solutions before a plan or project may proceed despite potentially adversely affecting the integrity of a European site. European Commission guidance, reflecting rulings from the European Court of Justice, indicates that before reaching that conclusion all ‘feasible’ alternative solutions, which meet the plan or project's aims should be assessed to ensure they do not better respect the integrity of European sites. This should include assessment of a 'do nothing' alternative.

We set out below our assessment of the 'do nothing' alternative. In the assessment of alternatives we have also considered the overall process and approach used in the development of the strategy to determine whether feasible alternatives exist that deliver the aims of the strategy in a way that better respects the integrity of European sites.

5.1. Aim of the Strategy

Our objectives for updating the existing national FCERM Strategy are framed by legal requirements set out in the Flood and Water Management Act 2010 and elsewhere. The Strategy has a vision that the nation should be ready for, and resilient to, flooding and coastal change up to 2100, taking account of a changing climate. The Strategy also aims to fulfil commitments in the Government’s 25 Year Environment Plan.

The Strategy seeks to update the original national strategy published in 2011 in a way that strengthens approaches to flood and coastal resilience, adaptation to future climate risks and opportunities for achieving multiple benefits including environmental protection and enhancement. This includes:

- integrating sustainable environmental outcomes into flood and coastal resilience
- working with natural processes to mitigate and manage flood risk and using more natural flood management solutions in rural, urban and coastal situations
- promoting adaptive pathways in strategic flood and coastal risk management planning to better plan and adapt to climate change
- improving the resilience of properties and businesses at risk of flooding so that they can recover faster following flood events

In light of these aims of the Strategy the following sections explain the assessment of alternatives in more detail.

5.2. The 'do nothing' alternative

The ‘do-nothing’ alternative has been rejected as unfeasible for the reasons outlined below.

We have defined the 'do nothing' alternative in terms of the likely evolution of the baseline environment in the absence of the Strategy. This assumes that no action is taken to review and refresh the 2011 national FCERM Strategy. As a result the current Strategy would continue to be implemented. However, since 2011, government policy has changed significantly and as such the 2011 national FCERM Strategy does not fully reflect the current policy context and the commitments in the Government's 25 Year Environment Plan. In addition, the evidence base for informing future investment needs has changed considerably since 2011 as evidenced in the 2019 Long Term Investment Scenarios.

Furthermore, society's understanding of the impacts of climate change has advanced, such as through the 2018 UK Climate Impacts programme.

If the ‘do-nothing’ alternative was implemented, the 2011 Strategy would potentially conflict with current government policy and the latest evidence base. It could also fail to realise opportunities for improving and restoring the natural environment as set out in the SEA environmental report for the Strategy. The Strategy is also intended to support RMAs

in taking action that reflects the urgency and challenge of climate change, which is not well reflected in the 2011 national FCERM Strategy.

Finally, the 25 Year Environment Plan makes a commitment to revising the national FCERM strategy. If the ‘do-nothing’ alternative was implemented, this commitment would not be fulfilled.

5.3. Alternatives in the development of the strategy

As set out in the SEA environmental report (section 4.4) we have developed the Strategy through an extensive process of stakeholder engagement, generating a wide range of potential measures for the Strategy. The stakeholder engagement included involvement with a range of environmental bodies.

Through stakeholder dialogue combined with specialist analysis, those measures that do not best achieve the objectives for the Strategy were discarded or amended. The Strategy underwent public consultation during 2019, following which we have further refined its text and measures to take account of stakeholder feedback. The measures now included in the Strategy are therefore a result of an inclusive and transparent process.

5.4. Other approaches

The 2011 national FCERM Strategy considered, and rejected, the following alternative approaches:

- high level frameworks
- detailed prescriptive rules

We believe that these two alternatives remain inapplicable. They would not achieve the aims of updating the existing national strategy and/or would not do so in a way that would allow us to conclude with certainty that the integrity of European sites could be better respected.

5.5. Alternative measures

In according with the highly precautionary approach required by the Habitats Directive, we cannot completely rule out the potential for the Strategy to affect European sites anywhere within England.

Many of the points made in sections 5.2 and 5.3 above are relevant to any alternative Strategy that included removing these measures. Removing many of the measures from the Strategy in order to avoid an adverse impact would mean the Strategy would not achieve its purpose, so is not a feasible alternative. Other measures are essential to the continued effectiveness of FCERM activity of RMAs. In the majority of instances of their application there will be no impact.

Finally, the HRA has identified steps have been or will be taken to avoid and/or reduce the incidences where European site integrity will be damaged, keeping this to an unavoidable minimum. With this mitigation in place, it is considered that any feasible alternative Strategy would not better respect the integrity of European sites.

6. Habitats Regulations Assessment: stage 5 IROPI and compensatory measures

The Habitats Regulations require that if there are no feasible alternative solutions, the strategy can only be carried out for imperative reasons of overriding public interest (IROPI), sufficient to override the ecological importance of the designation/s. The imperative reasons may be of a social or economic nature. In the case of a site or sites that host a priority natural habitat type or priority species, the reasons must be for human health, public safety, beneficial consequences of primary importance to the environment, or for reasons specifically approved by the European Commission.

The results of the Appropriate Assessment are that we cannot conclude that there won't be adverse effects on the integrity of one or more European sites, although it is not possible to predict impacts on any particular site. The integrity of a site hosting a priority natural habitat type / species may therefore be adversely affected by the Strategy, therefore the imperative reasons for the strategy must be for reasons of human health, public safety or beneficial consequences of primary importance to the environment or else ones specifically approved by the European Commission.

In the case of the Strategy, the failure to proceed would mean that the overall framework or co-ordination of the management of flood and coastal erosion risk in England will remain the 2011 Strategy. That Strategy is out of date and does not fully reflect current policy or practice.

The Environment Agency has a legal duty to exercise a general supervision over all matters relating to flood and coastal erosion risk management in accordance with Part 1 of the Flood and Water Management Act 2010 (the Act) – what is known as its 'Strategic Overview' role. This role is distinct from the Environment Agency's operational role. The Strategic Overview role encompasses the Environment Agency's development and application of a national FCERM Strategy (Section 7 of the Act).

The Strategy serves as the lynchpin of the wider legal framework for managing flooding and coastal change in England. Risk management authorities – including the Environment Agency, local authorities, internal drainage boards, Highways England, Transport for London and water companies - all have duties to act consistently with the Strategy when carrying out their flooding and coastal erosion functions. They also have duties to exercise other functions that could affect flooding or coastal erosion, having regard to the Strategy. Unitary authorities and county councils must ensure their local flood risk strategies are consistent with the Strategy and many of those councils are looking to update their local strategies this year.

The Environment Agency needs to update the 2011 Strategy to also account for the 25 Year Environment Plan and more accurate forecasts of climate change effects from the UK Climate Impacts Programme.

The level of societal impacts and losses at the national scale, in the absence of an updated and effective Strategy for flood and coastal erosion risk management, is enormous. 5.2 million homes and businesses are at risk of flooding in England. 1.8 million more are at risk of coastal flooding and erosion. At the regional scale it can undermine the viability of communities and have significant impacts on the economy. The impacts on deprived communities are likely to be greater as they are less likely to be insured, are likely to be in poorer health and are less able to finance a rapid recovery. This is likely to be exacerbated by climate change, predicted to result in sea level rise, increased coastal storminess and increased peak river flows. Flood risk results not only from direct over-topping or failure of defences and flooding incidents, but restrictions on emergency services being able to assist the public and to reach casualties due to floodwaters.

The Strategy is essential for the continued and improved national co-ordination of all aspects of FCERM, including planning and co-ordinating effective emergency response, and managing existing and planning future FCERM assets. Therefore without the Strategy, there would be a significant risk to the viability of communities, material assets and infrastructure from flooding and coastal change, and ultimately increased risk to human health and public safety.

There are therefore considered to be relevant imperative reasons over overriding public interest for the Strategy.

These imperative reasons fulfil the requirements as stated in the Habitats Directive, being of fundamental importance for the long term protection of communities and infrastructure, therefore justifying the overriding public interest reasons, being of a social or economic nature. Furthermore, the imperative reasons are also for the protection of human health and of public safety across England, therefore satisfying the over-riding public interest requirements for sites that host priority natural habitat types / priority species.

The Habitats Regulations require that, in order for the Strategy to proceed, the appropriate authority must secure any necessary compensatory measures. The compensatory measures must be provided to balance the strategy's adverse effects on European sites,

in order to ensure that the overall coherence of the network of European sites is maintained.

This Strategy is non-spatial in nature, and does not in itself lead to losses of Natura 2000 habitat: it sets out the principles under which investment will be made rather than defining the investment and its potential impacts directly. This HRA is therefore not where the precise impacts of the Strategy are determined, or what the resulting compensation requirements will be. The Strategy's potential for adverse effects on European sites will be assessed within a hierarchy of HRAs in lower-tier plans, strategies and projects.

The more detailed assessments of the likely gains and losses of habitats of importance to European sites undertaken by risk management authorities during the preparation or revision of such strategies will provide a clearer picture of the scale of compensatory work required to deliver the ambitions of the National Strategy. These requirements are

currently broken down into a series of logical geographical areas in the Environment Agency's FCRM Habitat Compensation Programme. This will be a key part of determining the detailed habitat compensation assessment needs on a scheme by scheme basis.

This Programme uses a mixture of SMP and catchment boundaries and Environment Agency Area boundaries to define ten discrete units within which the detailed information on Natura 2000 habitat gains and losses can be quantified and projected with reference to Plan, Strategy and project HRAs as well as monitoring evidence and relevant research,

In this way the precise amounts of new habitat that need to be created, alongside other compensatory measures, can be confirmed and updated regularly.

The Habitat Compensation Programme focusses in particular upon the longer term impacts of FCRM activity upon European sites, which are often more significant than the direct losses due to construction. The strategic approach taken using this Programme means that habitat change can be modelled and projected over longer time periods and greater spatial scales, explicitly noting the uncertainty surrounding those projections. It

also means a strategic approach to compensation can be delivered, making compensation more cost-effective: suitable compensation sites can be identified and acquired in advance of need, lowering acquisition costs and ensuring ecological coherence is maintained whilst incremental losses occur. Larger sites can also be found that compensate for smaller pockets of habitat loss, providing enhanced ecological value.

The compensatory measures arising from direct losses in European sites resulting from construction and other project implementation factors are identified at the project level and form part of project costs. Those compensatory measures arising from 'coastal squeeze' - the gradual loss of inter-tidal habitat due to the pressure of sea level against fixed defences - and other incremental losses are funded directly from the FCRM Capital Programme. The Environment Agency provides a report to Defra every two years on progress delivering all FCRM-related compensatory requirements, which includes a summary for each geographical area of work done, projected habitat change and work planned or underway to address any losses to internationally important sites.

The Strategy provides that risk management authorities must comply with environmental legislation in undertaking their FCERM activities, including specifically that concerned with habitats and wildlife. Consequently, wherever their FCERM activities unavoidably damage European sites risk management authorities will take necessary measures to compensate for that damage, including via the Habitat Compensation Programme referred to above.

With future climate change it is likely that avoidance, mitigation and compensation will increasingly focus on improving the resilience of the environmental processes that are essential to European site and species survival. All risk management authorities are required by law to exercise their FCERM functions consistently with the Strategy, including its cross reference to environmental legislation. Consequently, it has been secured that in adopting the Strategy any necessary compensatory measures for related impacts will be implemented.

7. Hierarchy of strategies and need for further Habitats Regulation Assessment

It is recognised that the strategy sets the strategic direction for managing flood and coastal erosion risk in England. Many measures contained in the strategy cannot be put into

effect until lower-tier strategies, plans, projects or activities arising out of the strategy are implemented. Consequently the potential impacts of the strategy, within a spatial framework, cannot be fully determined until more detailed assessment has taken place. Plans and projects arising from the strategy will be subject to further Habitats Regulations Assessment, to demonstrate that they have met the requirements of the Habitats Regulations.

The preparatory work supporting this HRA can be used to provide an overview of the requirements and various stages of the HRA process. It can be used to highlight the habitat types of European sites that could be affected by the strategy. The report provides reference to the sources of information for European sites, their qualifying interests and conservation objectives. This overview of the types of impacts that may arise from FCERM activities, also summarises the approaches set out in the strategy to avoid and mitigate impacts.

8. Summary and conclusions

8.1. Consultation

A Habitats Regulations Assessment of the Strategy has been developed by the Environment Agency. A draft was made available for consultation and the response informed the HRA of the final, amended Strategy.

8.2. Levels of HRA

This Habitats Regulations Assessment (HRA) has been carried out in a manner which is consistent with the non-spatial, strategic nature of the Strategy. Given the high-level national basis of this Strategy, the detail of where and how lower-tier plans, strategies, projects and FCERM activities will be implemented is not yet known.

Separate HRAs will be needed alongside the consideration and development of the subsequent lower-tier site specific plans and projects.

8.3. Screening

The Strategy is not directly connected with or necessary to the management of any European site. The assessment of 'likely significant effect' of the Strategy has not been able to conclude without reasonable doubt that a number of measures in the Strategy could not in theory affect one or more European sites.

The HRA needs to take a highly precautionary approach to the Strategy and so takes a worse case outlook. In practice the actual impact on European sites would need to be assessed through site specific HRAs for individual plans and projects taken forward.

8.4. Appropriate Assessment

At this national strategic level, it is not possible to predict or describe with any certainty all potential impacts associated with the different activities, plans and projects that may potentially result from the Strategy. A range of potential generic impact types may arise, that may pose risk to the qualifying features and conservation objectives of European sites.

The Habitats Directive requires a highly precautionary approach. The Strategy is high level and not spatially specific. We therefore cannot be certain that in theory a number of the measures would not, alone or in combination, prejudice the lasting preservation of such habitats and species and so result in adverse effects upon the integrity of European sites.

The Strategy incorporates a number of measures and text that help mitigate the effects on designated sites. Furthermore, the Strategy has measures that are not only looking to mitigate environmental impacts but enhance the natural environment, aligned with the Government's 25 Year Environment Plan.

8.5. Alternative Solutions

Not developing the Strategy is considered likely to result in greater impacts on European sites, and strategic opportunities to deliver improvements to favourable conservation status of European sites may not be realised. The 2011 Strategy is now very out of date - in terms of current policy and practice.

Developing alternative proposals to the Strategy, such as a detailed prescriptive rules approach (incorporating criteria for European sites) or alternative measures, is not considered feasible or likely to have a reduced impact on European sites.

8.6. IROPI

The Strategy is required to ensure the continuing coordination of FCERM across England and to ensure that FCERM activities align with current policy and practice, including in light of predicted climate change. The Strategy needs to fulfil legal requirements under the Flood and Water Management Act. Consequently, adopting the Strategy is considered necessary for imperative reasons of overriding public interest related to human health and public safety.

8.7. Compensation

The Environment Agency and other RMAs have programmes for the implementation of compensatory measures. These can be used to secure any necessary compensatory measures that are implemented to protect the integrity of European sites. The Strategy is high level so it is not possible to predict what compensatory measures might be appropriate in individual cases. Such measures will be expected to be identified at suitable locations at the project level, or alternatively following HRAs of the more spatially specific local FCERM strategies.

9. Acknowledgements

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11. List of abbreviations

- CFMP - Catchment flood management plan
- cSAC - Candidate Special Area of Conservation
- Defra - Department for Environment, Food and Rural Affairs
- FCERM - Flood and Coastal Erosion Risk Management
- FCS - Favourable conservation status
- FRMP - Flood Risk Management Plan
- HRA - Habitats Regulations Assessment
- IROPI - Imperative reasons of over-riding public interest
- JNCC - Joint Nature Conservation Committee http://jncc.defra.gov.uk/
- MPS - Marine Policy Statement
- NPPF - National Planning Policy Framework
- NFM - Natural flood management
- pSPA - Potential Special Protection Area
- RBMP - River Basin Management Plan
- RMA - Risk management authority
- SAC - Special Area of Conservation http://jncc.defra.gov.uk/page-23
- SCI - Site of Community Importance
- SEA - Strategic environmental assessment
- SPA - Special Protection Area http://jncc.defra.gov.uk/page-162
- SUDS - Sustainable drainage system
- SMP - Shoreline management plan
- WFD - Water Framework Directive
- WWNP - Working with natural processes

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