

SALTFLEET TO GIBRALTAR POINT STRATEGY

NON-TECHNICAL SUMMARY



Environment
Agency

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Foreword

Just over 45,000 people live within the Saltfleet to Gibraltar Point Strategy area¹ and each year a further 2.7 million people visit the area generating almost £500 million annually for the Lincolnshire coastal economy². Our flood risk management work in this area is absolutely vital for the continued success of Lincolnshire's coastal communities, its bustling tourism industry and its strong agricultural sector.

As climate change predictions increasingly become reality it is crucial that we take into account and plan for the effects of severe weather and sea level rise throughout our work³. We regularly review our flood risk management strategies and plans to ensure we continue to provide a sustainable and affordable future for all.

Over the last 24 years, we have nourished the beaches in Lincolnshire between Mablethorpe and Skegness with sand to provide a wide defence which reduces the impact of wave action and tides, in combination with the existing hard and soft flood defences. This work has proved very successful in managing tidal flood risk for Lincolnshire. However, our estimates suggest it will not be sustainable to continue with this method of flood risk management in the future due to the increased levels and frequency of sand that would be associated with the effect of climate change.

1 Lincolnshire County Council, "Demographic Projections for Coastal Districts in Lincolnshire". March 2012, Page 6

2 East Lindsey District Council, "East Lindsey Coastal Strip STEAM Final Trend Report for 2015-2017". page 4

3 <https://www.gov.uk/government/collections/environment-agency-and-climate-change-adaptation>

Our strategy for the next 100 years has been reviewed in line with government requirements and has been assessed against environmental, economic and sustainability factors. We have also listened to feedback received through our extensive consultation efforts.

We are very pleased to now present this strategy which is adaptable to a changing climate, and which will enable us to continue to provide and maintain coastal sea defences with healthy beaches for the enjoyment, wellbeing and prosperity of people visiting, working and living in Lincolnshire.

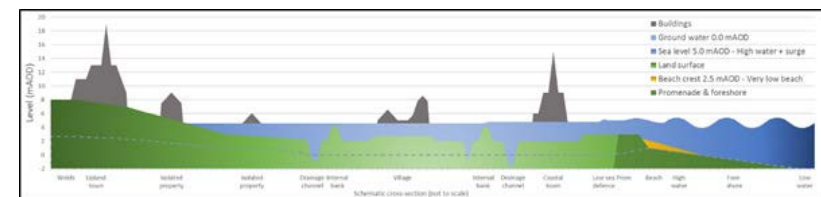
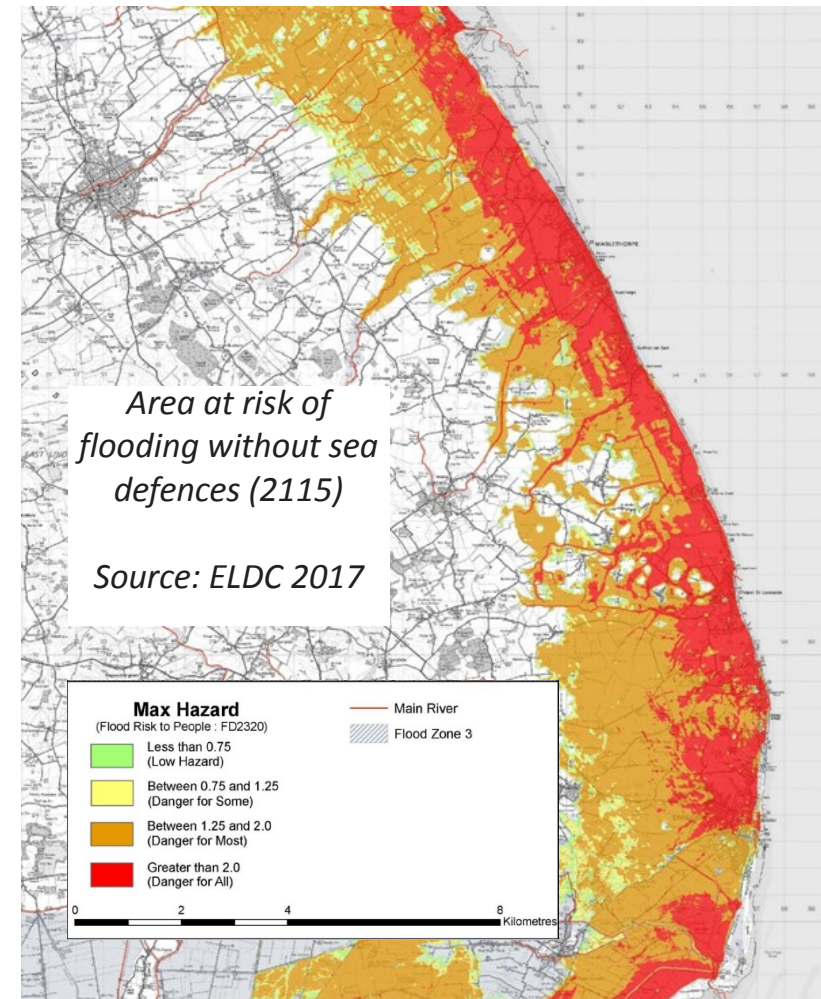


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Schematic cross-section of the Lincolnshire flood plain with- out a flood defence

1. Introduction

This document is the non-technical summary of our Saltfleet to Gibraltar Point (SGP) strategy and has been designed to provide you with a clear and concise overview.

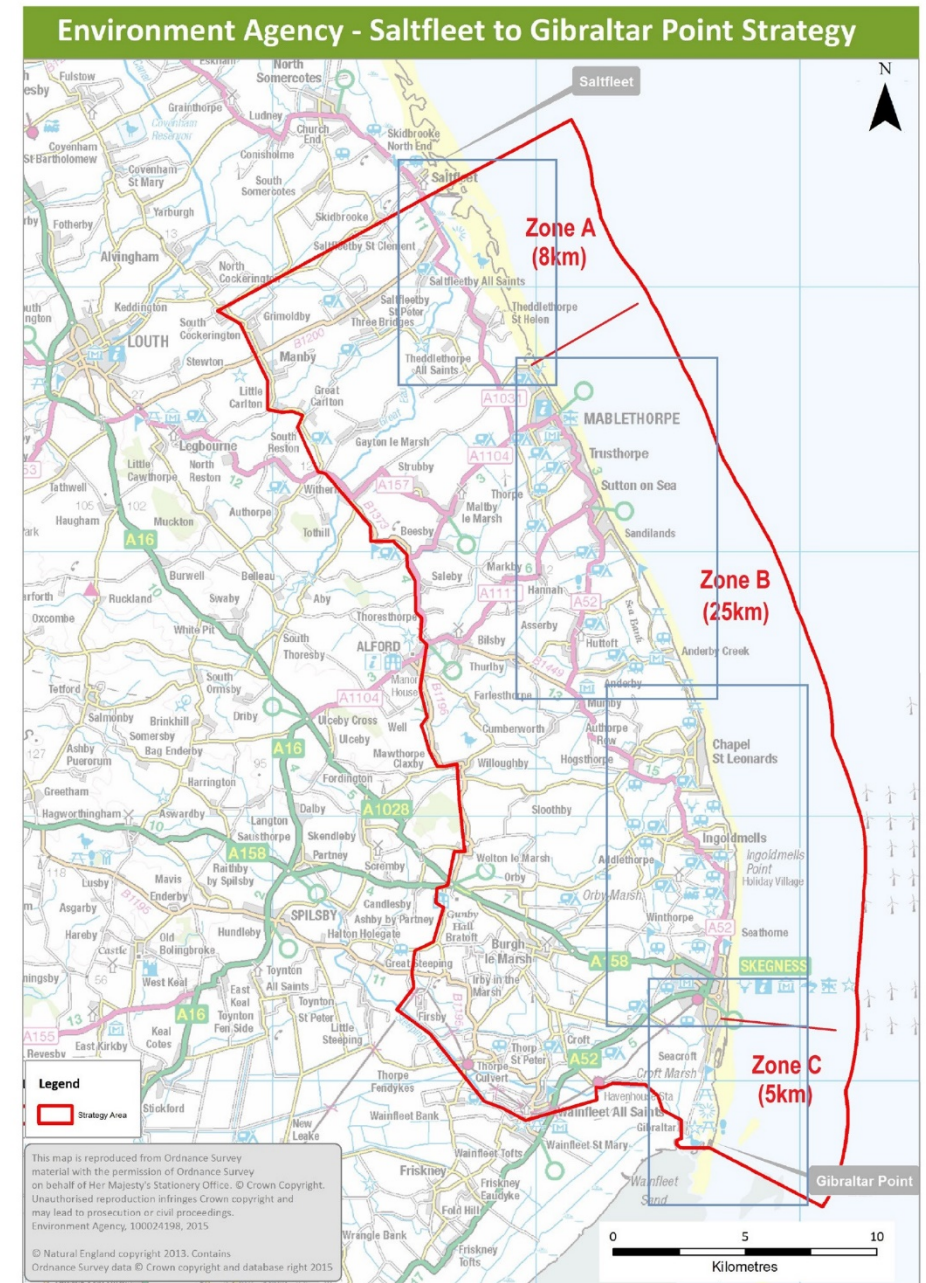
This document will set out:

- The local context and history
- The process that has shaped this new strategy
- The proposed strategy

Lincolnshire relies on many systems to protect it from flooding from the sea and extreme rainfall. The strategy frontage between Saltfleet and Gibraltar Point covers 38km of the open coast. Over half of normal high tides are above the level of the land behind the sea defences. If these defences were not in place, floodwater would reach up to 15km inland regularly, increasing with predicted climate change predictions and sea level rise. This frequency of inundation would most likely render areas uninhabitable and unsafe for any of their current uses.

Across the strategy area, 20,000 residential properties, 1,700 businesses, 24,500 static caravans and 35,000 hectares of farmland are at risk of flooding. The Lincolnshire coast is also home to a bustling tourist industry as well as a wealth of internationally important wildlife and nature. Hundreds of thousands of people visit the coast every year to enjoy the area's beaches, its sand dunes and its seaside resorts between Skegness and Mablethorpe.

1 Write to Monica Stonham, SGPS Engagement Officer, Kingfisher House, Goldhay Way, Peterborough PE2 5RZ. Freepost envelopes available on request.



The Saltfleet to Gibraltar Point Strategy will meet the aspirations of the Shoreline Management Plan (SMP) for Flamborough Head to Gibraltar Point SMP². This SMP is a partnership document that sets the policy intent for this coastline. SMPs exist for every section of the English coast, and they identify how flood risk is managed on the coast in the short term, medium term and long term.

The Shoreline Management Plan policy for this frontage is to 'hold the line', which means we keep the line of defence in approximately the same location, over the 100-year plan period. However, in the long term there is potential for limited 'managed realignment', which means small areas where defences may have to be set back. The current method of protecting this frontage and maintaining the level of protection is to nourish annually between Mablethorpe and Skegness, replacing the sand lost through natural processes during the previous year. This nourishment is carried out in combination with a routine maintenance programme for the hard sea defences.

The strategy area is divided into three sections: Zone A, Zone B and Zone C (please see figure above). To date the evidence means our nourishment work is concentrated within Zone B, the central area between Mablethorpe and Skegness, as this is typically where beach widths are at their narrowest and sand losses at their greatest.

Management in Zones A and C will continue to be monitored and triggers will determine the need for change. Currently both Zone A and C are accreting (gaining sand quantities through coastal processes).

Having a healthy beach in front of a sand dune or seawall provides many benefits in providing an effective form of coastal defence. Maintaining beach profiles with shallow gradients absorb wave energy and provides protection to the existing seawalls. It limits wave depth, reducing overtopping and the risk of breach in stormy conditions.

Beach nourishment also protects the underlying clay layer from long-term exposure and erosion, which is crucial to the continued stability

of the foundations of the sea wall. In addition to offering effective management of tidal flood risk, this solution provides a sandy beach to the coastline, which supports a vibrant seaside tourism economy.

Beach nourishment in combination with both soft and hard defences is currently the most cost effective way to manage tidal flood risk.



2 <https://www.gov.uk/government/publications/shoreline-management-plans-smpls>

1.1 Vision and aims

Through this strategy, we aim to create a better place for people and the environment, by working in partnership to manage the risk of flooding from the sea. The objectives of this strategy are to:

- Provide sustainable flood risk management over the 100 year term of the strategy
- Mitigate against the risks of and adapt to the challenges of climate change and reduce our carbon footprint.
- Continue to investigate opportunities to secure the funding required to deliver the strategy.
- Protect the social, recreational, cultural, agricultural and commercial value of the coastal floodplain.
- Adapt to future opportunities, challenges and other key issues including tourism as well as environmental, social and economic factors.
- Support sustainable and resilient development in the coastal floodplain for economic growth.

The strategy has to work in parallel with our other work in this area, including cooperation with local communities and our routine maintenance work on flood defences. While this strategy seeks to offer an approach that is more sustainable in the long term, it will not be able to eliminate the risk of flooding completely. It is therefore vital that coastal communities take ownership of their risk of flooding and build a better understanding of what the risk may look like in the future. More information on flood risk and how to prepare for flooding can be found on our flooding [webpage](https://www.gov.uk/check-flood-risk)².



2. Background

The Lincolnshire coast has been a major tourist destination since the Victorian era, when resorts formed in Mablethorpe, Ingoldmells and Skegness. Over time, promenades and sea defences were put in place in these coastal towns.

1953

The 1953 floods caused devastation across the East Coast of the UK. 307 people lost their lives, including 42 in Lincolnshire.



1960s/70s

Further surges continue along the coast. Each time, the beach is stripped of sand exposing defences.

Between 1984 and 1997, 70% of the defences between Mablethorpe and Skegness were upgraded.



1994-98

Beach nourishment begins - rebuilding the beaches is completed by 1998. Annual nourishment continued under the name Lincshore.



2013

A storm surge, larger than 1953, hits the east coast. The defences work well and protect thousands of properties. Following the surge, we repaired damaged defences.



2016/17

The first workshops with partners are held for the new Saltfleet to Gibraltar Point Strategy.



2018

The public are asked their views on the strategy options to manage flood risk in the area. Lincolnshire Beach Management (LBM) 2018-2021 replaces Lincshore until the Strategy is delivered in 2021.

2019

The strategy was published for Consultation and approved.

3. Options

We started the strategy review process by drawing up a long list of options. The list contained over one hundred possible flood risk management options that could be categorized into several subtle variations of differing solution. We subsequently worked with national and local partners to produce a shortlist of six options.

The six shortlisted options are:

1. Continuation of present management (annual beach nourishment);
2. Using coarser sand, shingle or pebbles to nourish the beaches;
3. Structures (i.e. Rock Groynes) and nourishment;
4. Structures and fishtails plus nourishment;
5. Structures, fishtails and varying volumes of nourishment; and
6. Structures, fishtails and varying frequencies of nourishment

We assessed the costs and economic benefits of all of the above shortlisted options based on the following key factors:

- Damages avoided
- Potential for added value
- Funding required for each option, benchmarked to today's prices

Through the process of producing this strategy, we assessed what flood damage would be avoided to residential properties, industry and commercial premises against the cost of carrying out works for each shortlisted option over the strategy period.

The flood damage avoided by continuing with flood risk management has a much greater value than the cost of carrying out works, which means there is significant benefit in continuing with managing flood risk for the strategy area.

This financial benefit exists in addition to the social, cultural and environmental reasons to continue to protect this area. While all options we considered would help us avoid a significant amount of damage, the options that include the introduction of structures to the beach resulted in the highest return on investment in terms of flood risk protection.

The second element of the economic assessment was to look at any potential for added value. Some of the options that were shortlisted, in some way could present opportunities for added value in addition to the flood risk elements of the strategy. For example, rock structures (long breakwater arms) may form the basis for a pier, thereby creating new attractive space for local amenity. Added value would require additional funding as we are unable to use government flood risk management funds (Grant in Aid or GiA) for direct investment outside the scope of flood risk management measures. However, with the right partnership funding GiA may be used to "match fund" to support a range of additions for this coastline like a marina or lagoons that could offer and attract tourism destinations along the Lincolnshire coastline.

A final key element to our economic assessment of each option was to look at the funding required to deliver each option. While our current annual beach nourishment campaign is affordable, as outlined previously, it is likely the costs will rise significantly as the impact of climate change increases. Although introducing structures to the beach would incur a large cost upfront, it could reduce the frequency and volumes of sand required for beach nourishment.

The large upfront investment needed for the introduction of structures will need to be secured through government funding as well as third-party contributions. Under current government funding rules, we must justify any flood risk management project by demonstrating that the benefits of the project outweigh the cost. This benefit is usually expressed through damage avoided, as well as a range of other factors. We have demonstrated that the benefits of this strategy far outweigh the costs associated. Although this means that we can justifiably request a large sum of government funding, there is no guarantee that we would receive this funding. Flood risk management competes with a number of other high priority issues for government funding, and as such we cannot assume that central government will make funding available for the strategy delivery.

The strategy team will therefore continue to encourage third-party contributions from partners and businesses in the strategy area.

In addition to this economic assessment, our environmental specialists worked together with partners including Natural England, Historic England and Lincolnshire Wildlife Trust to assess the potential environmental impacts (both positive and negative) of the preferred strategy approach of introducing structures in combination with continued nourishment.

We undertook a Strategic Environmental Assessment (SEA) ahead of the publication of this strategy. We have produced a detailed Habitats Regulations Assessment (HRA) for the preferred option which was agreed by Natural England. The HRA and the SEA Environmental

Report set out at a strategic level the potential impacts that could result from the strategy approach and identify how these impacts could be mitigated.

The environmental assessments we have undertaken in collaboration with our partners have influenced the strategy. We will need to carry out scheme specific environmental assessments during the delivery of the strategy before we can obtain the consents needed for the strategy works. We will also look to identify opportunities to improve existing habitats and/or to create new areas where wildlife may thrive. Any environmental measures we do take will not compromise the provision of protection from flood risk in the strategy area.

Working closely with local stakeholders we were able to produce a shortlist of options, and in 2018 we went to consultation with the public on this shortlist. This enabled us to formulate the preferred option for change, which we are now taking forward as part of this strategy. During the 2018 consultation period, we organised a number of drop-in events along the coast with over 500 people attending, and over 65% returning a completed survey.

In the summer of 2019 we carried out further consultation on the draft strategy. We engaged with over 200 people through public engagement events and we reviewed 82 consultation responses. We also reached people throughout the review process through newsletters, press releases, partner and local stakeholder meetings, and by making copies of documents available in publicly accessible locations in the strategy area.

Visualisation of what structures may look like



4.1 The strategy

This strategy recommends a preferred approach of combining nourishment and structures on the beach as the most cost-effective and sustainable basis for future tidal flood risk management. Structures, such as rock groynes or fishtails, are a long established form of defence and are used on many coastlines both in the United Kingdom and across the world.

Examples of rock structures being used effectively in the United Kingdom to reduce and manage flood risk include Shoreham to Lancing in Sussex, or Rossall in Lancashire. Every stretch of coast is subject to different weather and wave conditions, so the fact that structures have worked elsewhere does not guarantee they will work in Lincolnshire – however early analysis has shown there are indications that the introduction of structures would have a positive impact on the strategy area.

The process of deciding when, where and in what configurations structures should be introduced will form part of the initial phases of the strategy delivery. We could not make these decisions at an earlier stage as we cannot start acting on any strategy until it is formally approved by the relevant bodies and put in place. Now that this strategy has been published, we will move on towards the strategy delivery stage, during which we will continue to engage with residents, partners and businesses to make important decisions about the exact nature and location of each of the structures.

The strategy is expected to be approved prior to 2021, and in the meantime, we will continue with our present management approach.

The new strategy will be adaptive to change driven by triggers. Triggers are best described as a change in circumstances that drives a change to how flood risk is managed over the strategy period:

Further triggers may be added where appropriate as the delivery of the strategy progresses. Through modelling and monitoring work, we will continually assess conditions which will determine if we need to change in the future. Changes could include a decision to construct

more or fewer structures or a change in beach nourishment (volumes/frequency) When a change is triggered we will review our strategy and may need to consult before making the necessary adjustments.

Trigger	Examples
Funding	New government funding rules
Climate change	Faster or slower sea level rise than predicted; increased storm rates
Availability of materials	Scarcity of non-renewable resources
Policy and plan change	Change in local government plans
Implementation impacts	Observed effects after implementing step change
Technological development	Availability of cost-saving new technology
Asset condition and performance	Decreased or increased losses of sand on the beach
Defence failure	Loss of beach
Resource resilience and succession planning	Limited number of experts in the relevant fields
Public and institutional acceptance of works needed to manage flood risk	Public's raised awareness of flood risk following a significant event

The structures we propose as part of the strategy could take a number of shapes and configurations. Rock structures or rock groynes could both help manage tidal flood risk by absorbing energy from incoming waves and stabilising sand movement and losses. This will reduce the amount of work required to maintain beach levels and protect both dunes and hard seawalls from the impact of wave action and tides. The reduction in sand required will also lead to a reduction in our carbon footprint for our flood risk management work.

4.2 Strategy delivery

The delivery of works over the full strategy period will be determined by the impact(s) of the above triggers, and we have produced an indicative timeline setting out our current programme.

In the first five years of delivery - starting from 2021, our focus will be placed on further development of the plans for the introduction of structures, including completion of the relevant environmental assessments, and obtaining the required permissions and consents. This process is required ahead of any construction on the beach and will be essential to the implementation of the structures.

During this phase, we will need to consider rock structure configurations and designs for consultation and potential additional funding opportunities.

Subject to the outcome of the first phase, the second five-year phase of the strategy we look to introduce the first set of rock structures in combination with continued beach nourishment. The exact location of the structures will be determined during the detailed design phase and will be informed by technical engineering knowledge, consultation with stakeholders, funders and local residents, as well as engagement with any other interested parties. It is likely that the first set of structures will be built in Zone B, between Mablethorpe and Skegness, where we already experience the greatest losses of sand each year, known as 'hotspots'.

Following construction of the first set of structures, we will need to closely monitor their performance to assess crucial data to determine future configurations, positioning and size. Timing for the delivery of further structures will depend on when triggers determine the need for change.

We will need to continuously monitor the coast and review our approach to flood risk management between Saltfleet and Gibraltar Point. It is expected that nourishment requirements will reduce significantly after the rock structures have had time to establish, which could lead to significant overall reduction of cost while continuing to provide Lincolnshire's coastal communities with a good standard of protection.



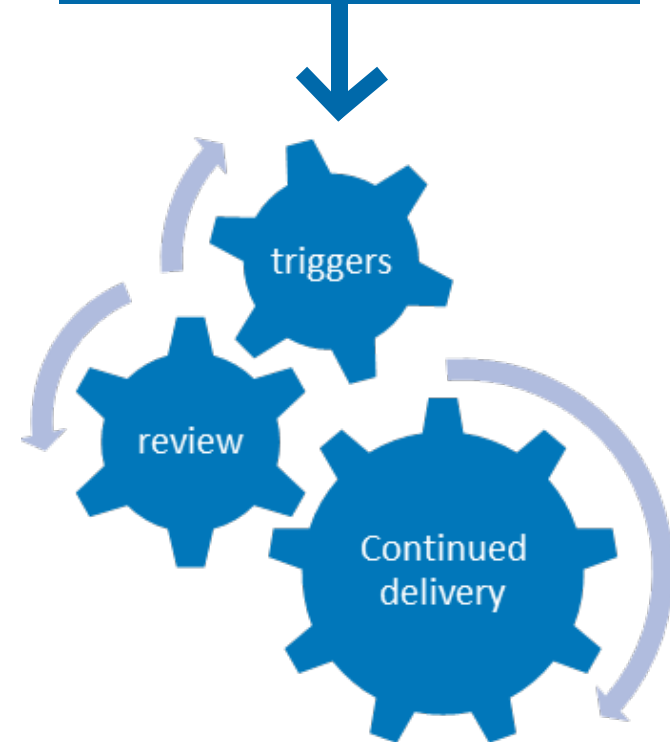
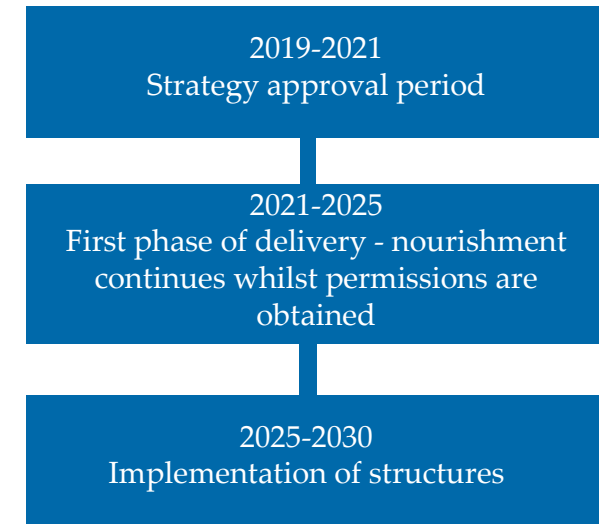
4.3 What's next?

The publication of this strategy marks the completion of our extensive review as well as the start of the strategy delivery phase. As outlined in the previous section, the strategy will be delivered in stages based on the triggers.

The strategy will remain a live document which is flexible enough to adapt to change, determined by trigger points.

Throughout the delivery of the strategy we will maintain regular contact with stakeholders, through a combination of newsletters, social media posts and news stories as well as meetings with partners and other stakeholder groups.

If you would like to hear from us as the strategy delivery progresses, please do not hesitate to contact us via angela.scott@environment-agency.gov.uk or by writing to our SGPS engagement officer at Kingfisher House, Goldhay Way, Orton Goldhay, Peterborough., PE2 5RZ.



1 Write to Monica Stonham, SGPS Engagement Officer, Kingfisher House, Goldhay Way, Orton Goldhay, Peterborough PE2 5RZ. Freepost envelope available on request.

Flood warnings – know what to do?



**FLOOD
ALERT**

PREPARE

- Prepare a bag that includes medicines and insurance documents
- Visit [flood-warning-information.service.gov.uk](https://www.flood-warning-information.service.gov.uk)



**FLOOD
WARNING**

ACT

- Turn off gas, water and electricity
- Move things upstairs or to safety
- Move family, pets and car to safety



**SEVERE
FLOOD
WARNING**

SURVIVE

- Call 999 if in immediate danger
- Follow advice from emergency services
- Keep yourself and your family safe