Broadland Futures Initiative

Sources of flood risk in the Broadland Futures Initiative plan area:
Who manages it and how

What is the Broadland Futures Initiative?

The Broadland Futures Initiative (BFI) is a partnership working to improve the resilience of people, homes, businesses, nature, and heritage to flooding across Broadland. As our climate changes and sea levels rise, we need new approaches to keep communities safe whilst looking after the natural environment that makes Broadland special.

Using this document

Broadland is one of the UK's most distinctive wetland landscapes, where flood risk management plays a crucial role in protecting communities, wildlife, and the economy. This document summarises: the sources of flooding affecting Broadland; methods of managing flood risks; roles and responsibilities of different organisations.

Sources of flooding

Understanding where flooding comes from is crucial for effective management. The Broadland area faces flooding from five main sources:

- Coastal flooding occurs from breaches, overtopping and erosion along the open coast, particularly along the Walcott and Eccles to Winterton frontages. This represents the greatest flood risk to the area, given that most land is at or below Mean Sea Level.
- Tidal flooding happens when storm surges and high tide levels flow up rivers and over riverbanks or flood management structures. This affects areas along the rivers and at Great Yarmouth where tidal waters can penetrate far inland causing flooding, as well as saltwater harming freshwater fish and wildlife.
- Fluvial (river) flooding results from high river levels following rainfall events, when water flows over riverbanks or flood management structures. A particular challenge called "tide locking" occurs along rivers like the Bure, and to a lesser extent on the Yare and Waveney, where incoming tides prevent river water from draining to sea for several days under certain weather conditions.
- Surface water flooding happens when water cannot drain away due to saturated ground, when drainage infrastructure capacity is exceeded, or when drainage systems fail. Given the largely rural nature of the area, property flooding from surface water is generally limited, with the exception of Great Yarmouth, where several areas have been flooded in the last two decades from surface water.
- Groundwater flooding occurs when water in permeable rocks rises to exceptionally high levels. This currently poses a lower risk across most of the plan area but must still be managed.

Who is responsible for managing flood risk?

Flood risk management in the Broadland area involves multiple organisations working together, each with specific responsibilities depending on the source of flooding. These are known as Risk Management Authorities (RMAs).

The Environment Agency

The Environment Agency has the broadest responsibilities and an overarching role in flood risk management. They are responsible for:

- Coastal flooding (along with local councils on some stretches)
- Tidal flooding
- Fluvial (river) flooding from designated Main Rivers
- National flood strategy
- Working alongside other RMAs to coordinate flood risk management

Lead Local Flood Authorities (LLFAs)

For Broadlands this is Norfolk and Suffolk County Councils. They are responsible for:

- Surface water flooding
- Groundwater flooding
- Smaller watercourses that are not designated Main Rivers
- Developing and maintaining flood risk management strategies
- Preparing flood risk assessments
- Leading on surface water management plans

Internal Drainage Boards (IDBs)

Three Internal Drainage Boards cover the BFI plan area. They manage approximately 80% of the plan area and are responsible for:

- Land drainage of surface water in rural areas
- Operating pumping stations to move excess water from low-lying land into rivers
- Using control structures such as sluices to manage water levels
- Each IDB spends over £1.5 million annually maintaining drains and pumping stations

Highway Authorities

These authorities manage surface water flooding on major roads such as the A47. Norfolk County Council maintains approximately 4,200 gullies and drains in the plan area and approximately 80 culverts.

Local Planning Authorities

The planning authorities covering this area are responsible for:

- Conducting Strategic Flood Risk Assessments (SFRAs)
- Ensuring developments don't increase flood risk elsewhere
- Directing development away from high-risk areas
- Requiring Flood Risk Assessments for development proposals

Regional Flood and Coastal Committee (RFCC)

The Anglian Eastern RFCC brings together elected local councillors and experts to:

- Approve annual flood risk management programmes
- Set local levies that fund local priority activities
- Coordinate regional flood risk management efforts

Individual responsibilities

Property owners also have important responsibilities:

- Riparian landowners (those owning land adjacent to watercourses) must ensure their actions don't increase flood risk upstream or downstream
- They must maintain watercourses to ensure water flow isn't obstructed. Read more GOV.UK
- All homeowners can prepare for flooding and protect their properties through various measures. Read more GOV.UK

Working together

These organisations work together and cooperate with each other, as clear communication and exchange of information is vital to ensure appropriate responses to every kind of flood event. This cooperation is particularly important because the combined effect of different flood sources can lead to greater overall risk.

The Broadland Futures Initiative brings together the Environment Agency, Natural England, County and District Councils, Internal Drainage Boards, Broads Authority, National Farmers Union, RSPB, Norfolk Wildlife Trust, National Trust and Historic England to develop a coordinated and integrated flood risk management plan to 2130.

Current flood management approaches in the BFI Plan area

Coastal protection

Along the coast, a 14-kilometre concrete sea wall stretches from Eccles to Winterton, completed in 1987 to prevent flooding from the sea. At Walcott, a 3.2-kilometre sea wall protects the Coast Road. These structures work alongside natural features – beaches and sand dunes provide crucial natural buffers against the sea.

Groynes, which are barriers built at right angles to beaches, help trap sand and reduce erosion. Sixty groynes protect the Eccles to Winterton stretch, whilst timber groynes between Bacton and Walcott maintain cliff protection.

Breakwater structures made of boulders run parallel to the coast, removing energy from waves to help maintain beach levels.

The area has also benefited from "sandscaping" projects, where large quantities of sand are added to beaches. In 2019, the Bacton to Walcott stretch received 1.8 million cubic metres of sand – equivalent to about 720 Olympic swimming pools – to increase beach width and height.

Flood gates and demountable barriers are used at points along the coastal stretch to prevent tidal surges breaching low points amongst the dune system (e.g. access points onto the beach). These gates vary in size and are normally left open to provide beach access, and closed when high tides and storms are expected.

River and tidal protection

Throughout the Broads, over 240 kilometres of grass-covered earth embankments line the main riverbanks, preventing tidal and river water from flowing onto adjacent land. In Great Yarmouth, more robust concrete flood walls founded on steel sheet piles protect against boat impacts and high-water levels, with flood gates providing additional protection.

Modern approaches increasingly favour, in rural areas, creating reedbeds and lagoons between rivers and embankments rather than using metal sheet piles. This provides multiple benefits: reedbeds buffer against erosion from waves and high flows, create extra flood storage space, and enhance natural habitats for wildlife.

Water level management

The flat, low-lying landscape requires active water management through approximately 60 pumping stations across the area. These pump water from drainage ditches into rivers, as natural drainage by gravity is often impossible.

Sluice gates control water movement between different parts of the drainage system, helping distribute water from high-level areas to those with lower water levels.

Most agricultural land within the plan area requires continuous active water level management to prevent it being permanently flooded, as it sits at or below sea level.

Natural Flood Management

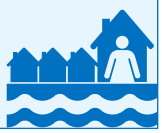
Natural Flood Management (NFM) works with natural processes to reduce flood risk whilst providing environmental benefits. Techniques include increasing rainfall infiltration by reducing soil compaction, slowing water flow through features like woody debris dams, creating wetlands for water storage, and restoring saltmarsh or sand dunes to dissipate wave energy.

These approaches are particularly valuable as they often cost less than traditional engineering solutions whilst providing habitat for wildlife and other environmental benefits.

Property Level Resilience

Individual property owners can install Property Level Resilience (PLR) measures to reduce flood risk. These include dam boards that slot into frames across doorways when flooding is forecast, covers for air bricks, flood doors with seals, and non-return valves to prevent flood water entering through existing pipes.

Some riverside properties have been raised or built on stilts, whilst others incorporate higher floor levels or living quarters upstairs. These measures typically protect against smaller, more frequent flood events.



Warning systems and emergency response

Properties at risk can receive flood alerts and warnings based on weather forecasting and flood modelling. These range from flood alerts for low-lying areas to severe flood warnings when there's danger to life.

Residents can sign up for these services online or by calling Floodline on 0345 988 1188.

During flood events, temporary barriers can be deployed, though these require specialist assembly and often work alongside high-volume pumps.

Local councils may distribute sandbags, though residents are encouraged to prepare their own flood protection measures.

Planning and Development Controls

Strategic Flood Risk Assessments guide development away from high-risk areas, whilst individual developments must demonstrate they won't increase flood risk elsewhere. New large housing developments must include Sustainable Urban Drainage Systems (SUDS) to manage surface water runoff through features like gravel drainage ditches and landscaped areas.

Adaptation strategies

In some locations, adaptation rather than protection may be necessary. This can include relocating communities at highest risk, as has happened in history elsewhere in Norfolk where villages have been moved inland due to coastal erosion. Such approaches require careful planning, community engagement, and appropriate funding mechanisms.

Funding and investment

Flood risk management in Broadlands requires substantial investment. Over £260 million has been spent in recent decades, including £143 million on the Broadland Flood Alleviation Project between 2001 and 2020, and £43 million on Great Yarmouth defences from 2009 to 2020.

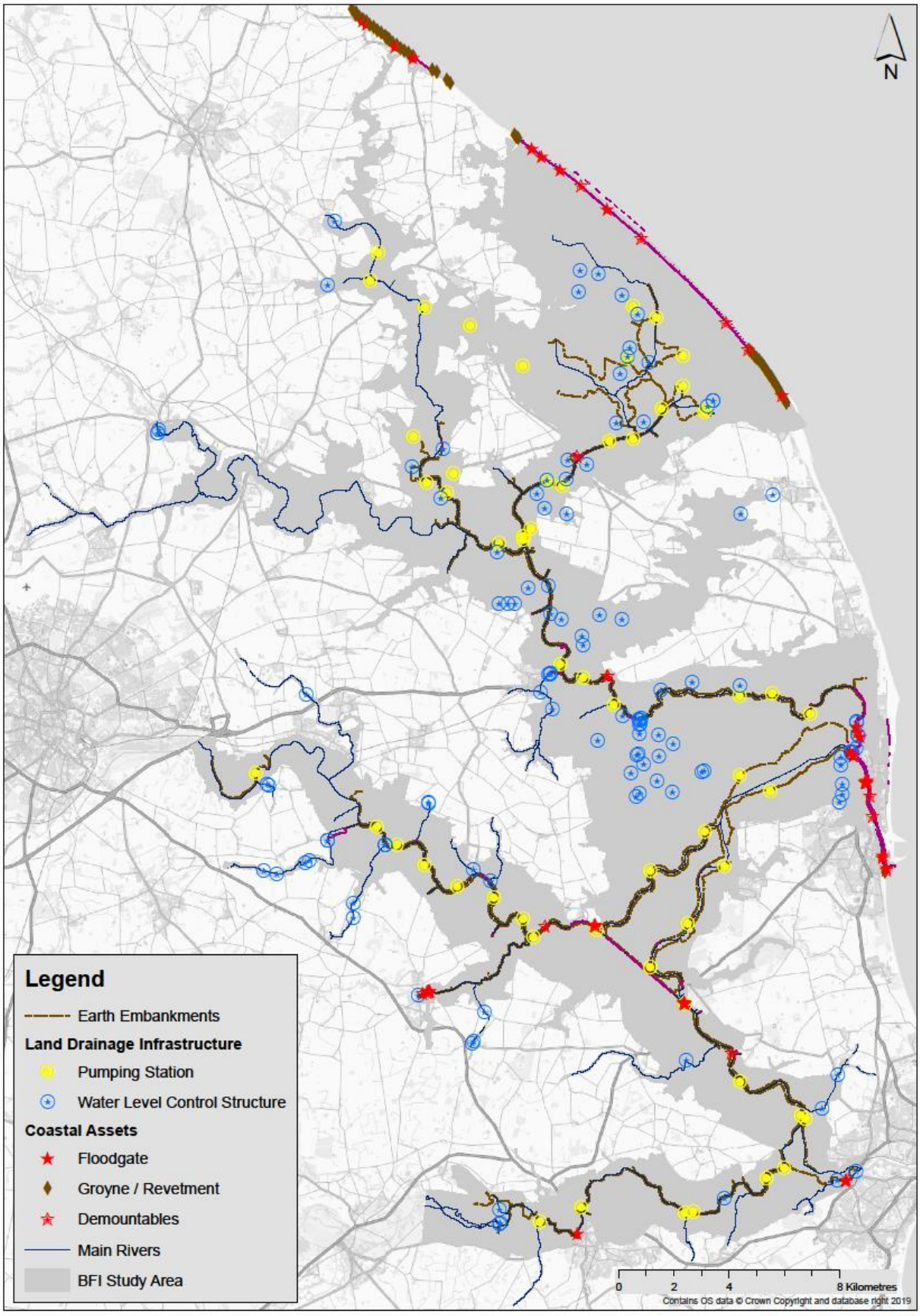
Funding typically comes from central government grants, though these often require supplementation from local partnership funding. The rural nature of much of the Broads means that schemes protecting relatively few homes may need significant local contributions to proceed.

Looking forward

The Broadland Futures Initiative recognises that flood risk cannot be eliminated completely but can be managed through careful planning and the right combination of approaches. The future approach developed through BFI will need to cope with climate change and rising sea levels, requiring innovative solutions that protect communities whilst preserving the unique landscape and wildlife that make the Broads so special.

The most effective flood management combines multiple approaches – from maintaining natural coastal defences and traditional engineering structures to property-level measures and emergency planning. Success depends on cooperation between the various organisations responsible for flood management and active engagement with local communities who understand their local flood risks and how to respond.

Appendix



Map showing key permanent flood risk management structures currently in the BFI plan area